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    Acting Director of SIIT.
    Associate Fellow of the Royal Institute.

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1. Professor Dr. Pakorn Adulbhan
   Chairman of the Committee.
   Director and Board Executive Committee of FTI.
   Fellow of the Royal Institute.
2. Professor Dr. Naksitte Coovattanachai
   Director of Royal Golden Jubilee Program,
   Thailand Research Fund (TRF), Thailand.
3. Professor Dr. Chongrak Polprasert
   Environmental Engineering, School of Environment,
   Resources and Development, Asian Institute of Technology.
4. Professor Dr. Wanlop Surakamponsorn
   Department of Electronics, Faculty of Engineering,
   King Mongkut's Institute of Technology Ladkrabang (KMITL).

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External Auditor
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Faculty of Commerce and Accountancy, TU.

Internal Processes Auditor
Mr. Nuttapol Sribunruangrit
Faculty of Commerce and Accountancy, TU.
2007 Graduate Catalog
and
2006 Annual R & D Report

Sirindhorn International Institute of Technology
Thammasat University
A Leading Teaching /Learning and Research Institute
2007 Graduate Catalog

and

2006 Annual R & D Report

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Preface

On January 29, 1992, with initial funding provided by Keidanren and the Federation of Thai Industries (FTI), the Thammasat University Council approved the establishment of bachelor's degree programs in civil, electrical, and industrial engineering, which became the autonomous International Institute of Technology (IIT), Thammasat University, on September 16, 1994, by Thammasat University Council's special regulation. His Majesty the King graciously granted the name "Sirindhorn International Institute of Technology (SIIT)" to the Institute on June 28, 1996.

Located at the Rangsit Campus of Thammasat University and the Bangkadi Industrial Park, SIIT is privately funded with initial funding provided by FTI and Keidanren. It is envisioned to become a leading international institute of technology for both teaching/learning and research.

1. Academic Programs

Sirindhorn International Institute of Technology (SIIT) offers undergraduate and graduate programs (master and doctoral levels) leading to the Bachelor of Engineering (BEng), Bachelor of Science (BSc), Master of Science (MSc), and Doctor of Philosophy (PhD) in the following areas: Chemical Engineering (ChE), Civil Engineering (CE), Electronics and Communication Engineering (EC), Industrial Engineering (IE), Mechanical Engineering (ME), Computer Science (CS), Information Technology (IT), Engineering Management (EM), and Management Technology (MT).

In the academic year 2006, the total number of SIIT undergraduate students was 2,000. First year students are admitted through the national university entrance selection process, the entrance examination conducted by SIIT, or through evaluations of standardized test scores, such as SAT and GCSE. The Institute also admits transfer students from other universities. Students wishing to transfer to SIIT are evaluated on a case-by-case basis.

SIIT started graduate programs in engineering and technology leading to master's and doctoral degrees in 1995 and 1997, respectively. In the academic year 2006, there were 25 master's degree students and 49 doctoral degree students. Interested individuals should consult the Graduate Catalog and contact the faculty members whose research interests match theirs.

2. Faculty Members

All SIIT full-time faculty members hold doctoral degrees from leading universities around the world. It is a policy of the Institute that faculty members be active in research. Results of their research and development are published in national and international journals, as well as regional and international conference proceedings, and are briefly presented in this report. They are therefore well qualified to provide up-to-date academic instruction to the students.

3. Academic Facilities

To achieve high quality academic services and research, the Institute maintains a conscientious effort to develop facilities of the Library and Information Services Center in addition to advanced laboratories. The SIIT library at Rangsit has a total floor area of 2,518 square meters with a 490-seat capacity. More than 25,800 volumes of publications are available. An SIIT branch library at Bangkadi has a total floor area of 1,200 square meters with a 180-seat capacity. The branch library has more than 6,800 volumes of publications. The library adopted the VTLS integrated library system in July 1995 to facilitate the usage of the Library collection. Computer facilities are also provided for accessing world-wide information resources, electronic journals and online databases.

SIIT at Rangsit has two five-storey buildings, the SIIT main building and the advanced laboratory building, and a small building housing the Environmental Technology Laboratory. There are two new buildings at Bangkadi, in addition to an existing building which is named after Thanpuying Niramol Suriyasat. One is a five-storey building housing the administration offices, and the School of Information and Computer Technology. It was completed in May 2002. The other, completed in October 2004, is a six-storey building. It accommodates the School of Communications, Instrumentations and Control, School of Management Technology, the Library, the computer center, engineering laboratories, and classrooms.

The Institute is deeply grateful to Her Royal Highness Princess Maha Chakri Sirindhorn for graciously granting the use of the name "Sirindralai" for the new six-storey building. Her Royal Highness graciously presided over the inauguration of the Sirindralai Building on June 28, 2006.

Since 1996, the Institute has graduated 12 batches of students and the total number of SIIT graduates (as of June 2007) is 2,949: 2,845 Bachelor's Degree, 70 Master's Degree and 34 Doctoral Degree graduates. Most of the graduates are working in industry, while many have chosen to further their studies in leading universities in Australia, Europe, Japan, and the USA.
2007 Graduate Catalog

Sirindhorn International Institute of Technology

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Sirindhorn International Institute of Technology
Thammasat University

Vision

To be a leading international institute of technology for both teaching/learning and research.

Missions

1. Primarily to produce high-quality bachelor-degree engineers and related technologists who are able to handle advanced industrial technologies and use English as a working language.

2. To conduct research and development in engineering and related technologies relevant to teaching and modern industries.

During the 9th Japan-Thailand Joint Trade and Economic Committee Meeting held in Kobe, Japan in 1989, the delegates from the Japan Federation of Economic Organizations (Keidanren – now Nippon Keidanren) and the Federation of Thai Industries (FTI) realized that in order to enhance industrial development of Thailand, engineering programs, where all lecture and laboratory courses would be taught in English by highly qualified faculty members with doctoral degrees, needed to be established.

A cooperation agreement among Keidanren, FTI, and Thammasat University was reached in 1992 to establish bachelor degree programs in engineering at Thammasat University with initial funds provided by Keidanren and FTI. After two years of successful operation, the “International Institute of Technology (IIT)” was founded on September 16, 1994. Her Royal Highness Princess Maha Chakri Sirindhorn graciously presided over the Cornerstone Laying Ceremony of a new building at the Rangsit Campus of Thammasat University, using part of the initial fund for the construction. His Majesty King Bhumibol Adulyadej of Thailand graciously granted the Institute a new name, “Sirindhorn International Institute of Technology (SIIT)”, on June 28, 1996.

On October 2, 1997, Her Royal Highness Princess Maha Chakri Sirindhorn graciously presided over the Sirindhorn International Institute of Technology’s Inauguration Ceremony of its name and building. In 1999, FTI provided a parcel of land with an existing building at Bangkadi Industrial Park (BKD) for SIIT’s use for 30 years. In June 2001, the former Prime Minister Anand Panyarachun inaugurated a new building at Bangkadi for Information Technology and Computer Science programs.

Her Royal Highness Princess Maha Chakri Sirindhorn graciously presided over the inauguration of the Sirindralai Building at Bangkadi on June 28, 2006. This new six-storey building houses the Electronics and Communication Engineering, Engineering Management, and Management Technology programs, a library, a computer center, laboratories and classrooms.

Thammasat University

Founded in 1934, Thammasat University was originally dedicated to the teaching of humanities and social sciences. The University has produced a large number of graduates who have greatly contributed to the development and progress of the country.

Realizing the significant impact of science and technology on the country's economic growth, in the 1980’s and 1990’s Thammasat University initiated degree programs in engineering, technologies, physical sciences, and medical sciences at its Rangsit Campus, Pathum Thani.

The Japanese Business Federation (Nippon Keidanren)

Through the merger of several economic and industrial organizations, the Japan Federation of Economic Organizations (Keidanren) was established in August 1946. Keidanren was a private, non-profit economic organization representing virtually all branches of economic activities in Japan. Keidanren maintained close contact with both public and private sectors at home and abroad, and endeavored not only to find practical solutions to economic problems but also to contribute to the sound development of the economics of Japan and countries around the world.

In May 2002, Keidanren merged with Nikkeiren (Japan Federation of Employer’s Associations) to become Nippon Keidanren (The Japanese Business Federation).
Headed by internationally distinguished leaders of the Japanese business community, Nippon Keidanren plays an active and influential role towards the achievement of harmonious economic prosperity for all mankind.

The Federation of Thai Industries

Formerly known as the Association of Thai Industries (ATI), the Federation of Thai Industries (FTI) came into existence on December 29, 1987. It was a transformed body of ATI, which was created in 1967. FTI is an industrial private sector that brings together industrial leaders to promote Thailand's socio-economic development. The main objectives of FTI are to represent Thai manufacturers at both national and international levels, to help promote and develop industrial enterprises, to work with the government in setting up national policies, and to offer consulting services to members.

FTI is a full-service organization that cooperates with the government to help mobilize Thai industries to reach international markets. It acts as a "match-maker" between foreign industrialists and Thai resources which combine the financial strength, planning ability, and persuasive power of Thailand's industrialists.

Sirindhorn International Institute of Technology

Sirindhorn International Institute of Technology (SIIT) offers undergraduate and graduate programs (master and doctoral levels) leading to the Bachelor of Engineering (BEng), Bachelor of Science (BSc), Master of Science (MSc), and Doctor of Philosophy (PhD) in the following areas: Chemical Engineering (ChE), Civil Engineering (CE), Electronics and Communication Engineering (EC), Industrial Engineering (IE), Mechanical Engineering (ME), Computer Science (CS), Information Technology (IT), Engineering Management (EM), and Management Technology (MT).

At the present time, the Institute has established both faculty member and student exchange programs with a number of universities in Asia, Australia, Europe, and North America. These programs allow not only faculty members to collaborate with their counterparts in research projects but also students to have an opportunity to take engineering courses at those universities. Additionally, invitations to visit and teach SIIT courses are regularly extended to qualified foreign professors under such programs.

Although it is a unit of Thammasat University, SIIT is financially and administratively separate from the central university system. SIIT’s policies and operations are guided and supervised by the Board of Trustees which consists of representatives from Thammasat University, FTI, and Nippon Keidanren, and scholars appointed by the university. In addition, the Academic Review Committee (ARC) comprising reputable scholars in various fields provides guidance and recommendations on academic and research matters. The Institute, headed by the Director, consists of administrative divisions, a library and information services center, academic schools, and Department of Common and Graduate Studies (CGS).

The Campuses of SIIT

Operations of SIIT are carried out at two locations: Rangsit Campus of Thammasat University and at Bangkadi, Pathum Thani.

Rangsit Campus

Campus and Transportation

The Rangsit Campus of Thammasat University (TU), is located approximately 20 kilometers north of the Bangkok International Airport (Don Muang), at km # 41 on Paholyothin Road (northbound). The campus can be conveniently reached by car via a multi-lane divided superhighway (Paholyothin), the Chaengwattana-Bangsai Expressway, and both outer East-Ring and West-Ring Highways. It can also be reached by buses No. 29, 39, and 510 (both air-conditioned and non air-conditioned). The nearest train station, the Thammasat Station, is near the northwest corner of the Rangsit Campus.

Facilities

Air-Conditioned SIIT Buildings

SIIT has two five-story buildings located at the Rangsit Campus. The first building is the main building with an area of almost 10,000 m², housing offices and classrooms. The first floor and a section of the second floor are occupied
by the Library and Information Services Center, with an excellent collection of up-to-date textbooks, magazines, and journals. SIIT’s academic programs and faculty members’ offices, as well as the Computer Center, are located on the second and third floors. Classrooms of various sizes are on the third, fourth, and fifth floors of the building.

The second SIIT building, adjacent to the first one, is a five-story advanced laboratory building with a total area of about 3,000 m². It was dedicated by Keidanren and FTI to SIIT on October 6, 1998. The Advanced Laboratory Building houses laboratories for conducting senior projects of fourth-year students, research work of graduate students, and research projects of faculty members.

Computer Center

SIIT Computer Center is located on the third floor of SIIT building. The center is equipped with microcomputers in three separate rooms, two of which are used mainly for instruction purpose on programming, mathematical problem solving, engineering graphic design and professional report preparation, while the other room is used by students for general computing purposes. Up-to-date software packages are installed via servers on the local area network allowing students to become proficient with their applications. The local area network system supports both academic and administrative chores which include the library’s computer-based services, e-learning/instruction, finance, and the internal mailing system for faculty members and staff. There are a number of servers for academic purposes in various programs. The local area network is connected to the Internet via the Thammasat-Rangsit fiber optic backbone. Students, faculty members and staff are provided with an individual e-mail address and service. Dial-up service is also available. Information on the Institute can be viewed from the official web page at www.siit.tu.ac.th.

Library and Information Services Center

The Library and Information Services Center is located on the first and second floors of the main building. The Library has an excellent collection of textbooks (in science and engineering), conference proceedings, reports, technical magazines, and journals. Electronic access to several international databases is provided. The Library also has a computerized search system to assist students in locating their information sources.

Students who would like to study by themselves or in groups will find it convenient to study in the Library. Individual study areas and group study areas are located both on the first and second floors. For group discussion, students can meet and discuss in the group study rooms on the second floor which provide maximum privacy and minimum interference.

Furthermore, students can use the main TU library, which is also located at the Rangsit Campus, for their study and literature searches on social sciences and humanities.

First-Aid Room

The SIIT first-aid room is situated on the ground floor of the main building. It is staffed during office hours by a fully qualified nurse. The nurse can assist with minor medical problems and, for more serious cases, can arrange timely transfer to Thammasat University Hospital.

Hospitals

Thammasat University Hospital, located at the Rangsit Campus, provides outpatient, inpatient, and emergency medical services, as well as other health care services such as X-ray, physical examination, and dental care. Physicians, nurses, and medical interns are available 24 hours a day. Students are eligible to receive discounts for room charges and services.

There are also several private hospitals near the Navanakorn Industrial Estate which is only a 5-minute drive from the Rangsit Campus.

Student Activities Center

A spacious student activities center is adjacent to the main building. There is a range of facilities available for student use including air-conditioned meeting rooms, and a food and drink area.

Student activities are coordinated by the student committee under the supervision of the Assistant Director for Student Affairs. All student activities must conform to the SIIT and TU regulations.
University Bookstore

The TU Bookstore at the Rangsit Campus is well stocked with publications and magazines in both Thai and English languages. Textbooks used in individual courses can be purchased at the University Bookstore at competitive prices. Stationery and office supplies are also available.

Post Office

The Thammasat-Rangsit Post Office is located on the first floor of the Administration (Dome) Building. The post office offers complete postal services such as regular mail service, express mail service (EMS), registered mail service, package service, and money orders during business hours.

Convenience Stores

Students living in the dormitories will find that shopping is quite convenient. The 7-Eleven store and TU CO-OP store are located on campus. The 7-Eleven store is open 24 hours a day.

Cafeterias and Canteens

Several cafeterias and canteens can be found throughout the Rangsit Campus. A variety of food is offered by vendors at reasonable prices, both on weekdays and weekends. Adjacent to the SIIT building is a cafeteria which serves both SIIT students and students of the Faculty of Engineering (Thai Program).

Additionally, there are two canteens inside the SIIT main building (on the first floor) and student activities center selling snacks and beverages.

Banking Services

For banking services such as cash withdrawal and balance inquiries, students can conveniently use the automated teller machines (ATM) which are located at various locations on campus and at the SIIT main building. For full services, students can go to the on-campus branch offices of Bangkok Bank, Krung Thai Bank, and Thai Military Bank. Other banks with branches near the campus are Kasikorn Bank, Siam City Bank, and Siam Commercial Bank.

Dormitories

The Rangsit Campus has on-campus dormitories for male and female students. Over 5000 living units are available to accommodate students, faculty members, and university staff. Within walking and short-driving distances, many private dormitories can be found. These are co-ed dormitories, as well as dormitories with separate buildings for male and female students. Air-conditioned units with bathrooms are also available.

Sports Facilities

The Rangsit Campus has a wide range of sporting facilities for students including swimming pools and practice fields for soccer, basketball, volleyball and tennis, all of which are in the vicinity of the student dormitories. Areas for indoor sports such as badminton and table tennis are provided in the indoor gymnasiums.

Other than sports activities, students may choose to exercise by biking, jogging, etc., especially in the morning since the air is very refreshing.

SIIT at Bangkadi

In 1999, FTI, with co-operation from Toshiba Thailand Co., Ltd., and Mitsui & Co. (Thailand), Ltd., provided 5.6 rai of land with an existing office building in the Bangkadi Industrial Park for SIIT’s use for a period of 30 years. The existing building was renovated and a new building was constructed. The two buildings have a combined area of approximately 3,300 m². The Computer Science and Information Technology programs moved to these new facilities in June 2002.

A new 6-story building with an area of 6,452 m² was completed in October 2004. Her Royal Highness Princess Maha Chakri Sirindhorn graciously granted the use of the name “Sirindhralai” for this new building and graciously presided over the inauguration of this new building on June 28, 2006. It houses the Electronics and Communication Engineering program, the Engineering Management program, and the Management Technology program, the library, the computer center, classrooms, and laboratories.
Bangkadi Campus is equipped with a complete computer/networking infrastructure. There are network access points in almost every room in the campus' buildings which connect to the Rangsit Campus by a high-speed line and connect directly to the Internet with speeds up to 2 Mbps bandwidth. Students can easily access the Internet either from their laptops, using wireless hotspots in every building, or from the computers in both the library and the computer laboratory. There are 70 computers in the computer laboratory for serving students.

The Library at Bangkadi is located on the 3rd floor of the Sirinhralai Building. The Library has an excellent collection of textbooks, technical books, conference proceedings, reports, technical magazines and journals in the fields of electronics and communication, instrumentation and control systems, computer science, information technology, engineering management, and management technology. Computer facilities are provided for accessing the library database, online databases and full-text journals, and for self-study. The library also provides wireless facilities for students to use their own notebooks to access Internet and online information sources.

Students may obtain services related to course registration, academic records, and financial matters at the Bangkadi Campus. Shuttle buses between the Rangsit and Bangkadi campuses are provided on a regular basis.

## SIIT Graduate Programs

### General Information

Sirindhorn International Institute of Technology offers graduate programs as follows:

- Master of Science in Engineering or Technology, by Thesis with Taught Courses.
- Doctor of Philosophy in Engineering or Technology.

### Application Form

Application form and letter of recommendation form may be downloaded from the website http://www.siit.tu.ac.th. They are also available from:

Admissions Division  
Sirindhorn International Institute of Technology  
Thammasat University - Rangsit Campus  
P.O.Box 22, Thammasat-Rangsit Post Office  
Pathum Thani 12121, Thailand.

Tel. +66 (0) 2 986 9009, (0) 2 564 3226 (Ext. 1520)  
Fax. +66 (0) 2 986 9106, 2 986 9112-3  
E-mail: graduate@siit.tu.ac.th  
http://www.siit.tu.ac.th

**Application fee:** 500 Baht (or 15 US dollars)

Candidates must complete an application form and submit their application documents to the Admissions Division at the above address.

**Application Deadline:**  
- The last week of April for June Semester  
- The last week of September for November Semester

### Interview

All candidates who have received notification of interview after having submitted their application forms shall be interviewed by at least three faculty members. The interview is conducted in English.

### Fees

The institute reserves the right to revise its charges for tuition and education support fees and to establish other fees as may be required by increased educational costs.
**Tuition Fee**

The tuition fee which includes charges for instruction and academic advice is **3,000 Baht per credit.**

**Education Support Fees**

The fees include services other than instruction, such as library, publications, thesis support, computing facility, counseling and placement, but do not cover the cost of damage to or loss of university property. The fees are charged at the following rates:

- **Full-time student:** **44,800** Baht per semester, **22,000** Baht for summer session.
- If register less than 6 credits in regular semester: **32,300** Baht per semester.
- If register less than 3 credits in summer session: **15,750** Baht for summer session.
- Status maintaining: **4,800** Baht per semester.

The total tuition and education support fee per semester is approximately 72,000 Baht for 9 credit hours.

Other fees such as late payment fee, late registration fee, and fine for overdue books may be charged.

**Financial Aid**

Internal and external scholarships are available each year to a number of students. For additional information, please contact the school heads or faculty members in the area of your interest.

---

**Academic Policies and Procedures**

**Semester Period**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td>June - October</td>
</tr>
<tr>
<td>Second Semester</td>
<td>November - March</td>
</tr>
</tbody>
</table>

**Academic Regulations**

**Registration**

A full-time student may register from 6 to 12 credits per regular semester and no more than 6 credits in summer.

A student who does not register to take any course in a semester must pay the "Student Status" maintaining fee.

**Evaluation of Academic Performance**

The academic performance of students on a taught course is measured by the grade point average (GPA) system or equivalent. The following grades are used:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Point</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
<td>Excellent</td>
</tr>
<tr>
<td>B+</td>
<td>3.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
<td>Good</td>
</tr>
<tr>
<td>C+</td>
<td>2.5</td>
<td>Fair</td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
<td>Poor</td>
</tr>
<tr>
<td>D</td>
<td>1.0</td>
<td>Very Poor</td>
</tr>
<tr>
<td>F</td>
<td>0.0</td>
<td>Inadequate</td>
</tr>
<tr>
<td>S</td>
<td>-</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>U</td>
<td>-</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>
Master Degree Programs

Admission Requirements

- Bachelor degree in engineering or science from institutions approved by SIIT Academic Review Committee (ARC).
- Overall cumulative GPA of at least 2.75 with research experience, or overall cumulative GPA of at least 3.00, or top 20% of the class.
- Two letters of recommendations.
- Approval of the admission by SIIT Executive Committee.

Graduation Requirements

A candidate for a master of science in engineering or technology program must successfully complete 39 credits and meet other requirements as follows:

1. Twelve credits of taught courses (see the course descriptions) with a GPA of at least 3.00 or equivalent.
2. Twenty seven credits of thesis.
3. At least one paper on thesis results must have been accepted for publication in a reputable international journal approved by the Academic Review Committee. The following alternate requirements may be used: one paper in a national journal approved by the Academic Review Committee and one paper in a refereed international conference. To graduate, one paper must have been accepted and the other must have been submitted. The advisor should make sure that the submitted paper will eventually get published.
4. Approval of the thesis by an external examiner appointed by the Executive Committee.
5. Satisfying one of the following English proficiency requirements: TOEFL not less than 530 marks (or 197 marks for computer-based test or 72 marks for Internet-based test), or IELTS not less than 6.0, or pass the TU-GET with a score of at least 550. Each student is expected to satisfy this English requirement within one year of enrolment.

Students with insufficient background may be required to take some basic courses and obtain satisfactory grades, as determined by the thesis committee.

Thesis Committee

The Thesis Committee consists of a) the chairperson who is a faculty member of SIIT and the student’s advisor, and b) two members, at least one of whom is a member of SIIT.

External Examiner

The external examiner must be appointed by the Executive Committee.

Maximum Period of Study

4 years

Taught Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 801</td>
<td>Advanced Engineering Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>or ES 811</td>
<td>Theory of Computation</td>
<td>3</td>
</tr>
<tr>
<td>ES 802</td>
<td>Research Methodology</td>
<td>3</td>
</tr>
<tr>
<td>ES 803</td>
<td>Special Study</td>
<td>3</td>
</tr>
<tr>
<td>ES 804</td>
<td>Selected Topic</td>
<td>3</td>
</tr>
</tbody>
</table>
Doctoral Degree Program

Admission Requirements

- Graduate of Master Degree in Engineering or Science or related fields with very good academic record and/or thesis experience; or Master Degree student of SIIT with at least one international journal publication.
- Two letters of recommendations.
- Approval of the admission by SIIT Executive Committee.

Graduation Requirements

1. A candidate for doctor of philosophy who has a master's degree must successfully complete 60 credits comprising at least 12 credits of coursework and at least 48 credits of thesis.
2. A candidate for doctor of philosophy who has only a bachelor's degree must successfully complete 90 credits, comprising at least 12 credits of coursework and at least 75 credits of thesis.
3. Each required course must have a "Satisfactory" grade, or at least a B grade.
4. At least two research publications accepted by reputable international journals, at least one of which must be listed in an international database with impact factor. It is recommended that there is at least one paper presented at a refereed international conference.
5. Approval of thesis by the thesis committee and the external examiner.
6. Satisfying one of the following English proficiency requirements: TOEFL not less than 530 marks or 197 for computer-based test or 72 for Internet-based test, or IELTS not less than 6.0, or TU-GET not less than 550. Each student is expected to satisfy this English requirement within one year of enrolment. This requirement is waived for students who have already satisfied the same requirement in the Master's degree program at SIIT.

Students with insufficient background may be required to take some basic courses and obtain satisfactory grades, as determined by the thesis committee.

Transferred Credits

A student in the doctoral program may request to have credits transferred from the courses taken during the master's degree program. A maximum of 9 credits from the master's degree courses can be accredited for Advanced Mathematics or Applied Mathematics or Theory of Computation, Research Methodology, and Selected Topic. The credits for Selected Topic must be from a course related to the student's research and must not have been used previously to satisfy the requirements of a degree. Courses which may be transferred are: courses instructed in English with a grade of B or better, courses instructed in a non-English language with a grade of B+ or better, courses instructed in a non-English language with a grade of B or better if the student has already passed the English proficiency requirement.

A student who enrolls in the doctoral program by upgrading from the SIIT master's degree program without receiving the master's degree may request to transfer up to 39 credits of coursework and thesis.

Taught Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 801</td>
<td>Advanced Engineering Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>or ES 811</td>
<td>Theory of Computation</td>
<td>3</td>
</tr>
<tr>
<td>ES 802</td>
<td>Research Methodology</td>
<td>3</td>
</tr>
<tr>
<td>ES 803</td>
<td>Special Study</td>
<td>3</td>
</tr>
<tr>
<td>ES 804</td>
<td>Selected Topic</td>
<td>3</td>
</tr>
</tbody>
</table>
Thesis Committee

The Thesis Committee consists of

- Two advisors comprising one principal advisor, who is an SIIT faculty member, and one co-advisor.
- Two committee members with at least one being a faculty member of SIIT.

External Examiner

The external examiner must be appointed by the SIIT Academic Review Committee (ARC).

Maximum Period of Study

Full-time students: 5 years (with MS), 6 years (without MS)

Course Descriptions

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits (Lecture-practice hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 801</td>
<td>Advanced Engineering Mathematics</td>
<td>3(3-0)</td>
</tr>
<tr>
<td></td>
<td>Mathematics for solving engineering problems; ordinary differential equations of higher order; partial differential equations; integral equations; numerical analysis; optimization techniques.</td>
<td></td>
</tr>
<tr>
<td>ES 802</td>
<td>Research Methodology</td>
<td>3(3-0)</td>
</tr>
<tr>
<td></td>
<td>Concept of scientific and technological research; statistics for research planning and research study; data collection and data analysis; interpretations, conclusions and recommendations of research results.</td>
<td></td>
</tr>
<tr>
<td>ES 803</td>
<td>Special Study</td>
<td>3(3-0)</td>
</tr>
<tr>
<td></td>
<td>Each student is required to undertake an in-depth study of an approved topic which will lead to formulation of thesis proposal. The study will be supervised by a faculty member. A written report and oral presentation have to be given at the end of the semester to the student thesis committee.</td>
<td></td>
</tr>
<tr>
<td>ES 804</td>
<td>Selected Topic</td>
<td>3(3-0)</td>
</tr>
<tr>
<td></td>
<td>Each student is required to select an advanced engineering or technological course relevant to the student's thesis. The course may be offered by SIIT or any other reputable graduate school but has to be approved by the student thesis committee.</td>
<td></td>
</tr>
<tr>
<td>ES 811</td>
<td>Theory of Computation</td>
<td>3(3-0)</td>
</tr>
<tr>
<td></td>
<td>Set theory; relations; formal proof methods; finite automata; regular expressions; context-free grammar; pushdown automata; Turing machines; uncomputability; computational complexity; first-order logic.</td>
<td></td>
</tr>
<tr>
<td>ES 898</td>
<td>Master's Thesis</td>
<td>3-12/semester</td>
</tr>
<tr>
<td>ES 899</td>
<td>Doctoral Dissertation</td>
<td>3-12/semester</td>
</tr>
</tbody>
</table>
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School of Bio-Chemical Engineering and Technology

Faculty Members and Research Interests, 2007

Dr. Luckhana Lawtrakul

**Assistant Professor**
B.Sc. in Chemistry, Kasetsart University, Thailand
M.Sc. in Physical Chemistry, Kasetsart University, Thailand
Dr.rer.nat. in Theoretical Biochemistry, University of Vienna, Austria

**Areas of Specialization:** Computational Chemistry, Computer-Aided Molecular Modeling and Molecular Design, Structure-Activity Relationships.

**Research Interest:**

Molecular modeling is a collective term that refers to theoretical methods and computational techniques to model or mimic the behavior of molecules. The techniques are used in the fields of computational chemistry and computational biology for studying molecular systems ranging from small chemical systems to large biological molecules. Currently applications in the following areas are of special concern: Molecular dynamics (MD) simulations and quantum chemical calculations on the stability of guest-cyclodextrins inclusion complexes, and Quantitative structure-activity relationship (QSAR) studies of inclusion complexes of various guests with cyclodextrins.

Dr. Pisanu Toochinda

**Lecturer**
B.Sc. in Chemistry, Mahidol University, Bangkok, Thailand
M.Sc. in Chemical Engineering, The University of Akron, Akron, Ohio, USA
Ph.D. in Chemical Engineering, The University of Akron, Akron, Ohio, USA

**Areas of Specialization:** Photo-catalytic synthesis of hydrocarbons from CO2/H2O, Photochemical solar cells, Gas-solid reactor design, Heterogeneous catalysis, Nano-material / zeolite syntheses, Bio-molecular imprinted materials.

**Research Interests:**

**Carbamate and Isocyanate Synthesis from Gas-Solid Catalytic Oxidative Carbonylation Reactions**

Development of environmentally benign synthesis processes that eliminate toxic feedstocks, combine process steps, and result in a net reduction of pollutants and energy use rests on, to a great extent, innovations in reactor design, reaction pathways, and catalysis.

Carbonylation reactions serve as a new route for non-phosgene processes in the production of carbamates and isocyanates at mild conditions for the replacement of highly toxic phosgene in the synthesis of carbamates and isocyanates. Combining the gas-solid reactor system and the Pd-based catalysts could provide promising alternatives for carbamate and isocyanate synthesis in the industry.

**Photocatalysis**

CO2 emission has become a worldwide problem due to its potential impact on global warming. Photocatalytic reactions, which involve the combined use of photo energy and catalysts to convert reactants to products, provide a promising alternative to reduce CO2 and convert it into useful hydrocarbon products (e.g., methane and methanol).

**Photochemical Solar Cells**

Solar energy could be converted into electrical energy via photochemical solar cells. A promising type of solar cell is based on commercially feasible and chemically stable wide-bandgap semiconductors (i.e. TiO2). In order to enhance the sensitivity of the cell to solar radiation, sensitizing organic dyes or semiconductor nanocrystals are coated on the metal oxide surface. While the solar cell is exposed to the sun, the sensitizers donate electrons into the oxide conduction band, after which harvesting of the electrons takes place, leading to solar power generation.
Dr. Rapeepong Suwanwarangkul

**Lecturer (Joined SIIT in October 2006)**

B.Eng. (Honors) in Chemical Engineering, Kasetsart University, Thailand  
M.Eng. in Chemical Engineering, Chemical Engineering Practice School (ChEPS), King Mongkuts University of Technology Thonburi, Thailand  
Ph.D. in Chemical Engineering, University of Waterloo, Waterloo, Canada  

**Research Interests:**

**Fuel Cell Science and Engineering**

Since the crisis of energy price (oil, natural gas) and environmental concerns have emerged, fuel cell technology is now considered to be one of the most emerging technologies to reduce air pollution and improve energy efficiency. My research work mainly focuses on Solid Oxide Fuel Cell (SOFC) operating at high temperature of 800-1000ºC. My interesting researches are to develop the mechanistic cell-level and stack-level models based on planar and tubular design to study the influence of cell design and operating conditions (temperature, pressure, cell voltage and syngas compositions) on cell performance. In addition, the SOFC system model including SOFC, gas/steam turbines, fuel processing and CO₂ capture process is developed to analyze the overall cycle efficiency and appropriate operating condition of SOFC system. Finally, we will study the possibility to operate SOFC using different gas feed-stocks (biogas, diesel reforming gas, propane, natural gas, ammonia, hydrogen sulfide and ethanol reforming gas) rather than hydrogen. We will also develop the mechanistic model to understand transport phenomena of these gases inside SOFC. This will help to design particular SOFC that match with the type of feed stock. This project is currently supported by National Metal and Materials Technology Center (MTEC).

**Process System Engineering**

Process system engineering focuses on simulation and modeling of chemical and related processes. The aims are to gain insight into the processes' behaviors leading to improvement of their operation and design. Furthermore, process optimization strategy can be obtained once the process model is established. Currently, the emphasis is placed on petroleum and petrochemical processes such as thermal cracking furnaces to produce olefin gas from liquid petroleum feed.

**Reactor Analysis and Design**

The design and operation of the catalytic reactor is sophisticated because of non-ideal behavior of the reactor which depends on reactor type, such as, fixed bed reactor and fluidized bed reactor. Therefore, in order to understand the fundamental operation of the reactor, it is important to develop the mathematical model to investigate the actual transport phenomena inside the reactor including mass, momentum and heat. The validated mathematical model will help scientists and engineers to optimize reactor configuration within a limited number of experimental investigations. My research work currently focuses on designing ethanol and methane reformers to produce hydrogen for fuel cells.

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Dr. Sandhya Babel

**Associate Professor**

B.Sc. in Biology/Chemistry, University of Indore, India  
M.Sc. in Biochemistry, University of Indore, India  
M.Sc. in Environmental Technology and Management, Asian Institute of Technology, Thailand  
D.Tech.Sc. in Environmental Technology and Management, Asian Institute of Technology, Thailand  
Areas of Specialization: Membrane technology; Solid waste management; Water and wastewater treatment; Environmental Impact Assessment.

**Research Interests:**

**Removal of Heavy Metals from Aqueous Solution/Sludges Using Agriculture Waste Materials**

Agricultural wastes are unused resources, which in many cases present a serious problem of disposal. However, these waste materials can be used to remove toxic heavy metal from wastewater as they are capable of binding heavy metals by adsorption, chelation and ion exchange. The exchange properties of these wastes can be attributed to the presence of carboxylic, phenolic, hydroxylic groups. In order to enhance cation exchange capacities, these groups may be modified by oxidation, carboxymethylation, acetylation, phosphation. The utilization of agricultural by-products in treating the wastewater/sludges contaminated by heavy metals is an attractive area of research.

**Environment and Development Perspectives: Life Cycle Assessment a Tool**

Developing countries in Asia have considered economic growth as the sole indicator of...
development. Monetary gain has dominated over environmental quality and the sustainability of natural resources. If a polluting factory yields a profit now, the effect on generations is forgotten. All this is carried out in the name of development and for the betterment of the quality of life without foreseeing the effect on the environment, which is the key component for sustainable development. Thus, it is necessary to analyze the existing situation and suggest measures to minimize the impacts on the environment and to conserve the finite natural resources. Life cycle assessment can be used as one of the tools to identify and assess the environmental burdens of different products or system over the entire period of its life.

Membrane Technology for Water Treatment

Membrane technology is an alternative to the long established conventional treatment techniques for the production of drinking water from various natural resources and its application to water treatment processes is now expanding rapidly due to stringent regulations. Membrane processes are capable of removing many materials from water that are typically treated using unit processes ranging from sand filtration to carbon adsorption to ion exchange. There is plenty of scope to focus research work on treatment of water by membranes and understanding the fouling phenomenon leading to the development of low-cost solutions to the drinking-water treatment problems.

Dr. Suwanchai Nitisoravut

Associate Professor
Diploma (Honors) in Analytical Chemistry, Institute of Analytical Chemistry Training, Ministry of Science, Technology, and Environment, Bangkok, Thailand
B.S. in Chemical Technology/Chemical Engineering, Chulalongkorn University, Thailand
M.S. in Biosystem Engineering, University of Hawaii at Manoa, Hawaii, USA
Ph.D. in Civil/Environmental Engineering, North Carolina State University, North Carolina, USA
Areas of Specialization: Environmental Biotechnology/Microbiology, Biological treatment of water and wastewater.

Research Interests:

Biological Nitrogen Transformation Using the ANAMMOX Process

The ANoxic AMMonium OXidation (ANAMMOX) process involves the use of nitrite as an electron acceptor in the bacterially mediated oxidation of ammonia to yield di-nitrogen gas. The process allows a nitrogen transformation similar to the classical processes of nitrification followed by denitrification. This reduces both oxygen demand in the nitrification and additional organic carbon as chemical oxygen demand (COD) in the denitrification phases. It is a new and promising microbial process to remove ammonia from wastewater characterized by a low content of organic materials.

Assimilable Organic Carbon (AOC) and Regrowth Potential in Drinking Water

During the last decade, research interest in drinking water treatment has focused on the biodegradable fraction of organic carbon in natural and treated water. This interest stems from the recognition that biodegradable organic matter in water can provide growth support to microorganisms which can be intensified during storage and travel within the distribution systems. Such phenomenon is known as biological regrowth and the fraction of biodegradable organic carbon is commonly termed biodegradable dissolved organic carbon (BDOC) or assimilable organic carbon (AOC). Biological regrowth in distribution systems has been known for years, as a potential cause of corrosion in distribution lines and deterioration of finished water quality, as well as an indirect link to waterborne diseases. It has, however, just come into attention, particularly for developed countries, due to the unclear impact on human health. Previous research has found that AOC can be effectively removed in an immobilized cell bioreactor.

Cell-immobilization Technology for Waste Treatment

It is generally known that microbial cells play an important role in biological treatment. To further enhance the process, the microbes can be immobilized in polymeric material which will provide a protective environment for the cells against toxic substances. At the same time, the microbial population can be intensified inside the carrier, thus allowing immediate biological activity for waste treatment. The technology has been proven feasible and effective in treating wastes biologically under severe conditions such as high toxic concentration and starvation environments. Previous research involving cell immobilization included the denitrification of spent regenerant from ion exchange processes and biodegradation of trace amounts of assimilable organic carbon in drinking water. The technology is believed to have a broad application which has yet to be explored.
Dr. Wanwipa Sriwatwechakul

Lecturer (Joined SIIT in June 2007)
B.S. in Chemical Engineering, Massachusetts Institute of Technology, USA
M.S. & Ph.D. in Chemical Engineering, Princeton University, USA
Area of Specialization: Biomaterials and drug delivery.

Research Interests:

*Polymer and Surfactant Self-assembly Drug Delivery*

Traditionally, disease treatment is delivered mainly through oral or intravenous means. In the case of cancer treatment, however, drugs are so toxic that delivering them through traditional methods would mean killing healthy living cells. Thus, delivery vehicles are used to encapsulate the drugs and deliver them to the cancer site while protecting normal cells.

We are interested in developing drug delivery vehicles from polymers and surfactants self-assembly. They are ideal candidates for this application because they are compatible with hydrophobic and hydrophilic drugs. The problem of delivering hydrophobic drugs is one of the foremost issues in pharmaceutical industry. In addition, polymers and surfactants allow flexibility in attaching targeting molecules to improve the treatment efficacy. We are also interested in drug delivery application in tissue engineering since it can provide vehicles to deliver proteins to promote the wound-healing process.

*Computational Fluid Dynamics Applied to Human Physiology*

The principles of chemical engineering fluid mechanics can be applied to the study of basic human physiology, such as fluid flow in the blood stream, workload requirements on the human heart and the implications of having cholesterol buildups. This understanding is essential in engineering better cardiovascular devices, and it will assist healthcare professionals in providing better treatment and prevention options for chronic heart patients.
School of Civil Engineering and Technology
Faculty Members and Research Interests, 2007

Dr. Amorn Pimanmas

**Associate Professor**
B.Eng. in Civil Engineering, Chulalongkorn University, Thailand
M.Eng. & Ph.D. in Civil Engineering, University of Tokyo, Japan

**Areas of Specialization:** Behavior, analysis and evaluation of damaged reinforced concrete members and structures; Nonlinear finite element analysis of reinforced concrete (RC) mechanics; Maintenance, repair and inspection of RC buildings.

**Research Interests:**

- **Strengthening of Reinforced Concrete Members by Fiber Reinforced Composite**
  Many existing reinforced concrete structures need strengthening to upgrade the load bearing capacity. Recently, fiber reinforced composite (plate and sheet) has been increasingly used to elevate the flexural capacity of the member. However, because of high stress concentration near the plate ends, peel-off failure takes place before fiber rupture. This reduces the efficient usage of fiber reinforced material. The research aims to prevent anchorage failure. A numerical analysis will be attempted to predict the anchorage failure load.

- **Evaluation of Damaged Reinforced Concrete Members**
  This research aims to evaluate the structural behavior of reinforced concrete members damaged by pre-cracks. This is a necessary step towards the evaluation of the whole structure. Experimental programs will be arranged to study the behavior of pre-cracked reinforced concrete members. Here, we classify the target members into 2 cases; that is, RC members governed by concrete compression failure (deep beams, beams with transverse bars) and RC members governed by concrete tension failure (lightly reinforced beams, beams with no transverse bars). The aim is to formulate a universal theory that explains both the compression and tension behavior of pre-cracked RC elements and members.

Dr. Krishna Murari Neaupane

**Associate Professor**
B.Eng. (First Class, First) Dept. of Mining & Geological Engineering, The University of Calcutta, India
M.Eng. in Geotechnical Engineering Program, Asian Institute of Technology (AIT), Thailand
D.Eng. in Geotechnical Engineering, Saitama University, Japan

**Areas of Specialization:** Numerical methods in geotechnical engineering; Mass transfer through porous media and its application to geoenvironmental problems; Underground space development and tunneling.

**Research Interests:**

- **Application of Coupled Processes to Geo-environmental Engineering**
  Many geo-environmental problems, including nuclear waste repository and sanitary landfill problems, involve three physical processes: mechanical, thermal and hydrological. Though one of these three physical processes plays a more dominant effect on the response of the system, the effect of the remaining processes may not be neglected, and a coupling of one or more processes is required for engineering analysis. The primary objective of this research is to model various geo-engineering problems using a coupled approach.

- **Soft Computing: Artificial Neural Networks, GIS, ANP**
  Geological engineering is often considered as an imprecise area of civil engineering. Artificial neural network can be a useful tool to deal with geotechnical 'black-box' problems. Major focus is on the application of Geographic Information Systems (GIS) to the field of geo-environmental engineering. Applications of ANP and BPNN within the GIS framework are under consideration.

  **Tunneling and Underground Excavation**
  In rock tunneling, research interests are mainly in the area of stress distribution around underground openings, numerical analysis, geotechnical monitoring and tunnel safety. In soft ground tunneling, major concerns are ground deformation around openings and settlement due to subsurface excavation.
Dr. Mongkut Piantanakulchai

Assistant Professor

B.Eng. in Civil Engineering, Chulalongkorn University, Thailand
M.Eng. in Transportation, Asian Institute of Technology (AIT), Thailand
Ph.D. in Transportation, Tohoku University, Japan

Areas of Specialization: Life Cycle Assessment (LCA) of transportation and infrastructure; Transport and environment; Input-Output modeling, and applied economic modeling for transport; and Multicriteria decision making.

Research Interests:

Multicriteria Decision Making in Civil Engineering

The current research interest focuses on applications of multi criteria decision making techniques to solve civil engineering problems. Possible topics include engineering design, prioritization and evaluation of public measures, classification problems, etc. Some research topics require knowledge and cooperation from multi-disciplinary fields. Examples of research being conducted include highway corridor planning, prioritization of highway accident reduction measures, landslide/seismic hazard zoning, seismic resistance and maintenance prioritization of existing buildings. Techniques such as the Analytic Network Process (ANP) and Fuzzy Decision Making Methods are used to solve the multicriteria decision making problems.

Highway Design Optimization

Highway design is a complex process that involves many constraints and objectives to be achieved. The conventional design method is manual. Therefore the number of alternatives is limited by the choices of the designer. It is also time and cost consuming to generate many alternatives by manual design. The research aims to apply some heuristic techniques such as Genetic Algorithm (GA) and Ant Colony Optimization (ACO) to solve the highway design optimization problem within the Geographic Information System (GIS) environment.

Dr. Pruettha Nanakorn

Associate Professor

B.Eng. (1st Class Honors) in Civil Engineering, Chulalongkorn University, Thailand
M.Eng. in Structural Engineering, Asian Institute of Technology (AIT), Thailand
D.Eng. in Civil Engineering, The University of Tokyo, Japan

Areas of Specialization: Computational mechanics; Finite element analysis; Design automation; Structural optimization.

Research Interests:

Analysis of Cohesive Crack Growth by the Element-Free Galerkin Method

In this research, the Element-Free Galerkin (EFG) method is extended to include nonlinear behavior of cohesive cracks in 2D domains. A cohesive curved crack is modeled by using several straight-line interface elements connected to form the crack. The constitutive law of cohesive cracks is considered through the use of these interface elements. The stiffness equation of the domain is constructed by directly including, in the weak form of the global system equation, a term related to the energy dissipation along the interface elements. Using the interface elements in conjunction with the EFG method allows crack propagation to be traced easily and without any constraint on its direction.

Structural Design Optimization by Genetic Algorithms

When designing structures, engineers have to consider not only the load-carrying capacity of the structures but also the cost to construct them. Designs that use smaller amounts of materials are preferable, given that the construction methods do not become impractical or too expensive. To achieve this goal, many optimization techniques have been employed in structural design, each of which has strong and weak points. Important characteristics of the structural design optimization problems are 1) the solution we seek is the global optimal solution, 2) the design variables are discrete. These two major characteristics suggest that Genetic Algorithms could be good choices. In this study, an appropriate optimization technique for structural design based on the Genetic Algorithms will be proposed.

Dr. Somnuk Tangtermsirikul

Professor

B.Eng. (Honors) in Civil Engineering, Chulalongkorn University, Thailand
M.Eng. & D.Eng. in Civil Engineering, University of Tokyo, Japan

Areas of Specialization: Modeling of concrete behavior; Durability of concrete; Special concrete; Use of wastes and recycled materials in cement and concrete; Repair and maintenance of concrete structures.
Research Interests:

**Performance Based Analysis and Design of Concrete Mix Proportions**

Simulation models for predicting materials, mix proportion, time and environment dependent properties of concrete are studied. At present, the studied properties are workability, bleeding, strength, thermal cracking, autogeneous and drying shrinkage, cracking resistance, carbonation, chloride induced corrosion, and sulfate resistance. Computer software is being developed for analysis and design purposes to obtain mix proportions of concrete with the required initial and long-term performances.

**Proper Use of Cementitious and Non-cementitious Powders in Concrete**

Studies on the properties of concrete with various kinds of powder materials are conducted. The materials are: fly ash, bottom ash, CaCO3 powder, lime ash, blast furnace slag, etc. Optimizing the use of these materials is the aim of this project.

**Special Concrete**

Various types of special concrete are studied with the aim to make proper use of local materials. Mix design processes in the forms of software and design charts are being developed. In addition to the mix design, some standard guidelines are being established. The studied types of special concrete are; self-compacting concrete, zero-slump concrete, low-heat concrete and expansive concrete, etc.

**Maintenance of Concrete Structures**

Research works on techniques for inspection are carried out. The works are parts of the program to develop an appropriate maintenance code for Thailand.

**Dr. Taweep Chaisomphob**

**Associate Professor**

B.Eng. (1st Class Honors) in Civil Engineering, Chulalongkorn University, Thailand
M.Eng. & D.Eng. in Civil Engineering, University of Tokyo, Japan

Areas of Specialization: Application of Three-Dimensional Finite Element Methods to the Design of Steel Structures; Development of Run-off-River Small Hydropower Projects; Development of Efficient Organic Waste Composting System for Small or Medium Communities.

Research Interests:

**Application of Three-Dimensional Finite Element Methods to the Design of Bridge Structures**

In order to propose the improvement in the design methods of bridge structures, a three-dimensional finite element method using solid and shell elements is employed. For the local stress analysis of a complicated bridge structure, such as a composite steel-concrete bridge, a model accounting for interaction between steel and concrete is developed. By carefully investigating the behavior of steel box-girders, the assessment of shear lag effects on stress and deflection is proposed.

**Development of Run-off-River Small Hydropower Projects**

Run-off-river small hydropower is considered as one of the promising renewable energy sources in Thailand, since it gives less environmental and social impacts. Feasibility studies of the hydropower projects of this type are performed by considering engineering, economic and environmental criteria. A geographical information system (GIS) is adopted as a tool for the present study.

**Development of Efficient Organic Waste Composting System for Small and Medium Communities**

Composting as the treatment of the municipal solid waste has been getting more promising as it has lesser effect to the environment. However, in the developing countries, it has usually been over looked due to its complex processes, and lack of technology. To eliminate such problems, this research project aims to develop a better composting system. A pilot plant was set up, and a series of experiments was conducted to study the optimal composting conditions, which would maximize its efficiency in actuality. This will be followed by a feasibility study and Life Cycle Assessment (LCA) of the proposal as a sustainable development for solid waste treatment methods in the future.

**Dr. Winyu Rattanapitikon**

**Associate Professor**

B.Eng. in Agricultural Engineering, Khon Kaen University, Khon Kaen, Thailand
M.Eng. in Water Resources Development, Asian Institute of Technology (AIT), Thailand
D.Eng. in Civil Engineering, Yokohama National University, Yokohama, Japan

Areas of Specialization: Mathematical modeling, Coastal engineering.
Research Interest:

**Mathematical Modeling for Cross Shore Sediment Transport and Beach Deformation under Regular and Irregular Waves**

Many numerical models had been developed to compute sediment transport rate. However, most of the models were developed under limited experimental conditions. Therefore their validity is limited according to the range of experimental conditions which were employed in the calibration. The evidence is that many models exist. The main objective of this research is to develop a reliable sediment transport model based on a wide range of experimental conditions.

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School of Communications, Instrumentations & Control

**Faculty Members and Research Interests, 2007**

**Dr. Banlue Srisuchinwong**

*Associate Professor*

- B.Eng. (Honors) in Electrical Engineering, King Mongkut's Institute of Technology Ladkrabang, Thailand
- Diploma of the Philips International Inst. of Technological Studies (Electronics), Eindhoven, The Netherlands
- M. Sc. & Ph.D. in Electrical Engineering, University of Manchester Institute of Science and Technology, UK

*Areas of Specialization:* Microelectronics, Analogue Integrated Circuits.

*Research Interests:*

- **Chaotic Oscillators**
  - Implementation of Chua's chaotic oscillators based on simple CMOS nonlinear resistors. Widely-tunable high-frequency Sprott's chaotic oscillators using current feedback operational amplifiers (CFOAs).
- **Harmonic Oscillators and Filters**
  - High-frequency low-power sinusoidal quadrature oscillators. High-Q wide-dynamic-range bandpass filters.

**Dr. Chalie Charoenlarpnopparut**

*Assistant Professor*

- B. Eng. (1st Class Honors with Gold Medal) in Electrical Engineering, Chulalongkorn University, Thailand
- M.S. in Electrical Engineering, The Pennsylvania State University, University Park, PA, USA
- Ph.D. in Electrical Engineering, The Pennsylvania State University, University Park, PA, USA

*Areas of Specialization:* Multidimensional systems and signal processing, Robust control, Image processing, Minimax controller design, Wavelet and filter bank.

*Research Interests:*

- **Digital Signal Processing**
  - Multidimensional signal processing has become more popular lately due to its efficiency and greater degree of freedom in the design. However, the design and analysis of multidimensional systems are generally more complicated and requires thorough understanding of abstract algebra. Applications of multidimensional DSP include image compression, video coding, multi-sensor system design, filter bank design and wavelet.
  - Recently with the usage of Groebner basis and conventional algebra, some n-D matrix factorization algorithms have been developed for some special cases. The general problem however, remains open. The solution to this problem will simultaneously solve many other important problems and can be directly applied to the multidimensional system realization and synthesis.

- **Multidimensional System/Robust Control**
  - Over several decades, great effort has been invested in the finding of a multivariate (n-D) polynomial matrix factorization algorithm. The problem has been completely solved only for the bivariate case.
  - Many signal processing techniques such as adaptive filtering and spectral analysis are used to improve the fidelity of the transmission and reception of digital signals. Unlike source coding, channel coding is used for the purpose of protecting the transmitted bit stream from erroneous receiving. Correction and
detection of error bits by means of algebraic coding techniques such as 1-D and 2-D convolutional code are usually employed. Topics of interest include: adaptive filtering, power spectrum estimation, array processing, 2-D convolutional code design, and application-specific coding design.

Dr. Duangrat Eungdamrong

**Assistant Professor**
B.S. & M.S. in Electrical Engineering, University of Wisconsin-Madison, WI, USA
Ph.D. in Electrical Engineering, University of Wisconsin-Milwaukee, WI, USA

**Areas of Specialization:** Wireless communication, Communication systems, Microwave and RF circuits, Antenna, Electrical Sensors.

**Research Interests:**

**Phase Noise Models**
Because of an exponential growth in wireless communication, demand for the frequency channels in mobile communication application is increasing, which in turn, imposes more stringent requirements on phase noise of circuits. Oscillator phase noise is an essential parameter that limits the performances of many modern telecommunication systems because introducing even small noise into the circuit leads to dramatic changes in its frequency spectrum and timing properties. Phase and frequency fluctuations have been the subject of numerous studies both experimentally and theoretically.

**Open-Ended Coaxial Line Microwave Sensor**
Open-ended coaxial lines have been used as electromagnetic sensors or probes in various industrial and scientific applications. This includes in-vivo characterization of biological media, nondestructive measurements of materials, and non-contact testing of disbonds in composites. In these applications, a radio frequency or microwave signal excites the probe that is placed against the sample medium. An echo signal received by the coaxial sensor carries the characteristics of the sample material. Therefore, the reflection coefficient (or aperture admittance) at the sensor can be monitored to extract the sample characteristics. Hence, the characterization process requires a suitable electrical model of the coaxial sensor in contact with the sample.

**Transformation of Transistor's S-parameters**
Manufacturers generally supply the data sheets of transistors containing S-parameters with respect to the emitter (or the source). In other words, the transistor is considered as a two-port device with common emitter (or common source) configuration. However, the design engineers may want to use other configurations of the transistor for certain circuits. Hence, the transformation of S-parameters of the transistor is needed. Feedback networks can be conveniently designed to obtain the desired device behavior.

**Antenna**
In recent years, the need of wireless communications, operating at 1.9 GHz, GSM-USA standard, 2.4-2.5 GHz, 802.11b WLAN, Bluetooth, 3G and 4G, has grown at an exponential rate. Thus, it has been an endless improvement in increasing the capability and quality of transmission. Because of the struggle to achieve high data rates without compromising the quality of the received information, a new multi-antenna system that yields substantially increased channel capacity had been proposed. In addition, a new Multiple-input Multiple-output (MIMO) system was also introduced to support this multi-antenna system. Information are transmitted and received through these multiple antennas. The system uses the special routes to transmit more information with little interference.

Dr. Sawasd Tantaratana

**Professor**
B.E.E. with high distinction, University of Minnesota, USA
M.S.E.E. Stanford University, USA
Ph.D. in Electrical Engineering, Princeton University, USA

**Areas of Specialization:** Communication systems, Spread-spectrum systems, Wireless communications, Signal processing, Digital filter design and realization.

**Research Interests:**

**Communication Systems**

**Wireless Communications and Spread-Spectrum Systems**
Spread - spectrum system design and analysis. Synchronization (acquisition and tracking), CDMA and OFDM. Multipath and fading effects in wireless systems. Optimum and sub-optimum receivers.
Digital Signal Processing

Signal and system analysis. Time-frequency signal analysis techniques. Digital filter, filter bank, and multirate converter design, analysis, realization, and applications. Techniques for simple realization and implementation of digital signal processors.

Dr. Toshiaki Kondo

Lecturer

B.Eng. in Mechanical Engineering, Tokyo Institute of Technology, Japan
M.Eng. in Information Processing, Tokyo Institute of Technology, Japan
M.Eng. in Image Processing, The University of Sydney, Australia
Ph.D. in Image Processing, National University of Singapore, Singapore

Areas of Specialization: Digital image processing, such as feature detection and segmentation in 2-D and 3-D. Computer vision, such as depth estimation and motion estimation. Pattern recognition, such as human face recognition.

Research Interests:

Digital Image Processing (especially Medical Image Processing)

Feature detection and image segmentation are the primary areas of my research interests. "Analysis of 3-D maxillofacial image data" is the title of my doctoral dissertation, which focused on the analysis of the human dentition and jawbone for orthodontic treatment and surgery. The extraction of anatomical features in retinal images is one of my recent research topics.

Computer Vision and Remote Sensing

Depth estimation and motion analysis are the areas of my long-term research interests. Depth estimation is the central issue in dealing with stereo (or more) images, while motion analysis is concerned about the process of time-sequential images. I am particularly interested in the "correspondence problem" that has to be solved for estimating both depth and motion.

Object Classification and Recognition

Image understanding is another area of my interests. This category has various applications for bioinformatics and industry, such as security control, parts inspection, grading and sorting, etc. A popular research topic in bioinformatics is human face recognition which I have worked on.

Dr. Waree Kongprawechnon

Associate Professor

B.Eng. (1st Class Honors) in Electrical Engineering, Chulalongkorn University, Thailand
M.Eng. in Control Engineering, Osaka University, Japan
Ph.D. in Mathematical Engineering and Information Physics, University of Tokyo, Japan

Areas of Specialization: The theory in $H^\infty$ control, the theory in Robust control.

Research Interests:

$H^\infty$ Control

The advent of $H^\infty$ control was a truly remarkable innovation in multivariable theory. It eliminated the classical/modern dichotomy by formulating the design issues of classical control property and has solved it based on the state-space tool of modern theory. The theory-practice gap was no longer a significant issue at the beginning of the 1990s due to a number of successful applications of $H^\infty$ control to real design problems, especially applications of $H^\infty$ control based robust control theory.

Robust Control

No mathematical system can exactly model a physical system. Nowadays it is gradually being recognized that the real issue of control engineering we were faced with was the difficulty of modeling the plant to be controlled. For this reason we must be aware of how modeling errors might adversely affect the performance of a control system. Robust control theory became the most popular area that was expected to deal with model uncertainty.
School of Information and Computer Technology
Faculty Members and Research Interests, 2007

Dr. Bunyarit Uyyanonvara
Assistant Professor
B.Sc. (1st Class Honors) in Science (Physics), Prince of Songkhla University, Thailand
Ph.D. in Image Processing, King's College, London, UK
Areas of Specialization: Image processing, Texture segmentation, Relaxation labeling, Medical imaging

Research Interests:

- **Image Segmentation Using Texture and Relaxation Labeling Algorithms**
  When normal density or intensity segmentation is not effective enough, a new representation of texture which is derived from the spatial energy of the texture is introduced in order to segment the given image. From the energy values, a 2D histogram of texture is generated. The texture histogram is used to discriminate textures and to retrieve image segmentation. In an attempt to assess the similarities in the regional areas, the property of adjacency could be useful. This characteristic of pixels is defined as a co-occurrence matrix, which is an important tool in Image Segmentation using Texture and Relaxation Labeling Algorithms.

- **Medical Image Processing**
  Taking advantage of the high capability of computers, offering advantages over film based systems, several image processing techniques are of interest, especially for medical purposes in order to get most of the information out of the given medical images. Essentially, medical imaging can make use of texture information, texture feature classification or texture segmentation because of the nature of the medical image itself. Medical assessment can then be made fully automated later on and this will lead to a reduction of human errors, increasing of consistency and repeatability. This can be distributed to the remote areas or hospitals that lack sophisticated treatment facilities or trained experts.

Dr. Cholwich Nattee
Lecturer
B.Eng. in Computer Engineering, Chulalongkorn University, Thailand
M.Eng. in Computer Science, Tokyo Institute of Technology, Japan
D.Eng. in Computer Science, Tokyo Institute of Technology, Japan
Research Areas: Artificial intelligence, Machine learning, Knowledge discovery and Data mining, Artificial Intelligence applications in distance learning and pattern recognition.

Research Interest:

- **Inductive Logic Programming for Structure-Activity Relationship Studies**
  Nowadays, a vast amount of chemical compound structure information can be produced due to advances in High Throughput Screening technology that automates compound screening using the combination of robotics, image processing and pattern recognition. From these data, knowledge describing compound activities and characteristics from their structures is essential, since it can be used for predicting characteristics of unknown compounds for developing new drugs. Machine learning and data mining techniques have been applied in order to automatically obtain models describing the relations between structure and activity. However, traditional data mining algorithms have limitations on knowledge representations. Thus, complicated structures of chemical compounds cannot be handled efficiently.

  Extended from traditional machine learning techniques, Inductive Logic Programming (ILP) applies first-order logic for representing data. This allows complicated structures or relations among training examples to be denoted without losing any information. Moreover, learning results in the form of first-order rules, are comprehensible. The knowledge obtained can be easily explained to domain experts.

Dr. Ekawit Nantajeewarawat
Associate Professor
B.Eng. in Computer Engineering, Chulalongkorn University, Thailand
M.Eng. & D.Eng. in Computer Science, Asian Institute of Technology (AIT), Thailand
Areas of Specialization: Knowledge representation, Computational logics, Formal ontologies, Semantic Web, Computation theory, Object-oriented system analysis and design.
Research Interests:

Semantic Web

The basic idea of the Semantic Web is to describe the meaning of Web data in a way suitable for automatic reasoning. Expectedly, the Semantic Web technology will bring about large-scale heterogeneous Web knowledge bases with a qualitatively new level of service. The concept of ontology (domain theory) will play a key role as a formal, explicit specification of shared conceptualizations that describe the semantics of data on the Web. Formal ontology languages as well as meta-level representation of Web resources are investigated. The possibility of developing automated reasoning systems for Semantic Web is explored from both theoretical and practical viewpoints, e.g., a hybrid approach with a strict separation between ontology predicates and rule predicates and a homogeneous approach embedding rules and ontologies in a logical language. Realization of the Semantic Web vision demands further research works on several other knowledge-representation-related issues.

Reasoning with UML Diagrams

The Unified Modeling Language (UML) is a graphical language, adopted as a standard from both theoretical and practical viewpoints, e.g., a hybrid approach with a strict separation between ontology predicates and rule predicates and a homogeneous approach embedding rules and ontologies in a logical language. Realization of the Semantic Web vision demands further research works on several other knowledge-representation-related issues.

Highly Reliable Wide Area Network Design

In the coming “Information Age”, business and daily life will be highly reliant on telecommunication services. All organizations, companies and ordinary homes will be connected together by the Wide Area Communication Networks (WAN) so that various kinds of services, provided at anywhere, can be accessible from everywhere at anytime. Network reliability will become a vital concern since the failure of network functionality will result in a significant impact on a wide-range of users both in tangible and intangible forms. Thus, technologies for designing and assuring the high reliability of WAN are needed. These include, for example, theory and tools to analyze the reliability-level of networks, automatic re-routing algorithms (self-healing algorithm) design, reliability-level based traffic prioritizing scheme,
working and spare capacity design and plans to upgrade reliability-level of existing networks, etc.

**Virtual Private Network**

The Virtual Private Network (VPN) is technology to enhance the utilization of an unreliable connection traversing through public networks (either circuit-switching-based or IP (Internet Protocol)-based network) and sharing bandwidths with other users to create a reliable/secured connection (virtual private connection) like a conventional leased circuit, but with much lower costs. The IP-based VPN is promising since IP-based applications are widely used in all communities. The IP-based VPN technology involves designing a security scheme to protect transferred data from other users, a bandwidth management scheme to retain the acceptable bandwidth-level of the connection and a parallel data-transferring scheme to create a virtual high-bandwidth connection from a group of low-bandwidth connections.

### Dr. Pakinee Suwannajan

**Lecturer**

- B.S. in Mathematics (Cum laude with distinction), minor in Computer Science, University of Delaware, USA
- M.S. in Applied Mathematics, University of Colorado at Boulder, USA
- Ph.D. in Applied Mathematics, University of Colorado at Boulder, USA

**Areas of Specialization:** Information Retrieval, Applied linear algebra.

**Research Interest:**

**Information Retrieval**

The number of text documents nowadays has grown very rapidly through widely varied media such as books, journals, and Webs. Getting information from the large collection of data or documents is not an easy task. Data indexing and retrieval are in the field of Information Retrieval (IR). It has been of interest to computer information scientists in the past few years. There are many search algorithms that are used to solve the retrieval problems, but each still has some disadvantages, especially in terms of storage usage, speed, and accuracy. This causes the search algorithms to be not as efficient as they should be. Finding ways to solve the problems is challenging and very useful for the users.

### Dr. Philippe Meunier

**Lecturer**

- B.Eng. in Computer Science, Ecole Nationale Superieure des Telecommunications de Paris, France
- M.Sc. in Computer Science, Rice University, USA
- Ph.D. in Computer Science, Northeastern University, USA

**Areas of Specialization:** Programming languages, Static analyses.

**Research Interest:**

**Modular Analysis of Higher-Order Languages**

Detecting bugs before releasing software is a major goal of software engineering. While a rigorous software development process and systematic testing help, only formal methods can guarantee the absence of bugs, or at least the absence of some classes of bugs. From sound type systems to theorem provers, such formal systems have been available for a long time, but the adoption of these advanced systems has been slow, due to both their inherent complexity and their sometimes poor running times.

My research focuses on static analyses for higher-order languages, in particular value-flow analyses for the Scheme programming language. The challenge is to create an analysis that is modular (so programmers can analyze individual modules even when the source code of the whole program is not available), fast, and precise (not too many false positives). Using a graphical static debugger based on such an analysis, programmers can view sound approximations of the values and errors that each expression in a program might produce at runtime, as well as view the flows of the values in the program. With this information, programmers can then easily trace the sources of bugs in an intuitive manner.

### Dr. Stanislav S. Makhanov

**Associate Professor**

- M. Appl. Math., Moscow State University, Faculty of Computational Mathematics and Cybernetics, Moscow
- Diploma in English Language, Moscow Institute of Foreign Languages, Moscow
- Ph.D. in Applied Mathematics, Computer Center of the Russian Academy of Science, Moscow

**Areas of Specialization:** Image processing, Robotics, Grid generation, Computational fluid dynamics.
Research Interests:

**Software for Optimization of the Tool-Path of Industrial Milling Robots**

Innovations in the field of mechanical engineering have enhanced the involvement of milling robots in various manufacturing processes. Nowadays, computer guided milling machines are employed to produce free-shape surfaces in mass manufacturing industries such as automobile, airplane, ship-building, etc. However, several physical phenomena, such as machine kinematics, thermal effects, static and dynamic loading, and common-cause failures often affect the quality of the desired surface. Although recent research papers have displayed a number of advanced methods to improve the characteristics of machining, a robust algorithm to generate the optimal tool-path for geometrically complex workpieces is still an open problem.

**Image/Signal Reconstruction**

Image processing and restoration has revolutionized the fields of medicine, space exploration, geology, and oceanography. A fundamental issue of image restoration is identification of the distortion in the presence of observation noise. However, it is well known that small variations of the initial data could lead to solutions far from a correct one. Moreover, the performance of the identification procedures critically depends on the assumptions regarding the size and the shape of the distortion. Therefore, an efficient procedure should be smart enough to perform an appropriate regularization and to recognize the size and the pattern of the distortion. These features are particularly important in the case of multi band wavelet based schemes since the procedure can not be decomposed with regard to filtered components of the image. The up-to-date literature on Image Processing clearly indicates the need for further research.

**Grid Generation Technologies**

Grid generation techniques emerged as a sub-discipline of Computational Fluid Dynamics in the early seventies. Nowadays grid generators are among the major components employed by versatile codes in Geometrical Modeling, Computer Graphics, CAD/CAM, Structural Analysis, Aerodynamics and Computational Fluid Dynamics. However, in spite of considerable efforts and a long time spent on curvilinear and moving grid generation, the theoretical principles have not been yet established. Grid generation today is still much more of an art than a science. Since many different approaches exist and are being used, creative craftsmen are needed to operate the various packages. Therefore, from an industrial point of view, issues surrounding efficient implementation, interactive, graphical user interface, visualization and software engineering in grid generation are of paramount importance.

**Dr. Steven Gordon**

Assistant Professor (Joined SIIT in October 2006)
B.Eng. in Computer Systems Engineering, University of South Australia, Australia
Ph.D. in Telecommunications, University of South Australia, Australia
Areas of Specialization: Telecommunications, Internet and Computer Networking including: Wireless Networks, Satellite Internet, Wireless security, Distributed computing and middleware, Formal methods and Petri Nets, System protocol design and analysis.

Research Interests:

**Mobile Peer-to-Peer Networking**

Low-cost wireless networking devices, such as Wi-Fi enabled laptops and mobile phones, has allowed mobile Internet access to flourish. Future advances in wireless networking, such as Mobile Ad Hoc Networks, Mesh Networks and Sensor Networks, will enable mobile Internet applications to be used in a more distributed manner, in particular Mobile Peer-to-Peer applications. To make Mobile P2P feasible, many networking challenges must be overcome, including: maintaining network performance in presence of voice and video applications; providing fair and/or prioritised allocation of resources to users (e.g. Quality of Service control); detecting, and preferably avoiding Denial-of-Service security attacks; and allowing users to seamlessly move between networks, while maintaining their application sessions.

**Formal Design of Protocols**

Communication protocols (such as TCP/IP, IEEE 802.11, GSM, P2P protocols) are a core part of technologies we use everyday: the Internet, mobile and landline phones, transport systems, home entertainment and so on. Hence, it is vital that these protocols operate in a correct, efficient and secure manner. The design and analysis of communication protocols has been a subject of research and engineering practice for years. However, with the ever-increasing release of new protocols, especially for the Internet and wireless networks, tools and techniques are needed to verify the design of common protocol mechanisms, rather than analysing every protocol individually. Two promising areas of research are: creating and verifying formal Petri net models of mechanisms that are applicable to a range of protocols; and integrating techniques for formal, performance and security analysis (e.g. combining Petri nets with simulation tools like NS2 and OPNET; using formal models for security proofs).
Dr. Thanaruk Theeramunkong

Associate Professor
B.Eng. in Electrical and Electronics Engineering, Tokyo Institute of Technology, Japan.
M.Eng. in Computer Science, Tokyo Institute of Technology, Japan.
D.Eng. in Computer Science, Tokyo Institute of Technology, Japan.
Areas of Specialization: Artificial Intelligence (AI), Natural Language Processing (NLP), Information Retrieval (IR), Knowledge Data Discovery, Data Mining, Machine Learning (ML), and Intelligent Information Systems.

Research Interests:

Natural Language Processing

(1) Robust NLP and Linguistic Knowledge Acquisition

While NLP systems are gradually becoming accepted by a wider range of people both in academic and business area, many difficult problems are still unsolved. One of the important problems is how to improve robustness and adaptiveness in NLP system, especially how to analyze and interpret various phrases and sentences which are ungrammatical (also called ill-formed inputs). A user-friendly system should be robust and flexible in that it can analyze any well-formed and ill-formed input efficiently. The system should also be adaptive to deal with phrases/sentences including unseen construction and vocabulary, for instance learning some new grammar rules. Currently, we are focusing on both rule-based and corpus-based approaches to cope with ill-formed inputs and, when needed, to acquire novel linguistic knowledge. On the increase of very large electronic corpora, statistics obtained from such corpora are a useful clue for this problem.

(2) Text Interpretation: Information Retrieval, Categorization and Information Extraction

In the past, most online information stored in databases or spreadsheets. At the present time, the majority of online information is text-based, e.g., e-mail, news, journal articles, reports, books, encyclopedias. These information sources are worth but there is too much information available, and not enough time to sort through it. Text interpretation techniques are helpful for categorizing, filtering and extracting information from text. Three types of text interpretation are information retrieval, categorization, and information extraction. We are interested in developing of efficient methods to various tasks of text interpretation.

Knowledge Science and Engineering

(1) Knowledge Data Discovery in Database

Knowledge Data Discovery (KDD) is a rapidly growing interdisciplinary field that merges together databases, statistics, machine learning and other AI technologies in order to extract useful knowledge from a large-scaled collection of data. The problems in this field are of two general categories: (1) prediction and (2) knowledge discovery. Knowledge discovery is a stage prior to prediction, where information is insufficient for prediction, such as clustering, association rules, text mining and so on. Our study aims at finding and implementing efficient, robust and scalable methods in real-world situation where databases are complex, voluminous, noisy and non-stationary. Some interesting applications include computer-aided education (CAI), decision support systems, and management information systems.

(2) Intelligent Decision Support Systems

In business, government, and other organizations, decision making plays an important part in determining the landscape of tomorrow’s world. Computer systems that assist decision-making process are called decision support systems (DSSs). Intelligent decision support systems (IDSSs) are DSSs that make use of techniques emerging from the field of artificial intelligence (AI). Our research focuses on studying new techniques in both (1) model-driven support systems, which are based on strong theory or model, and (2) data-driven support systems, which are based on database technologies and statistical methods.
School of Management Technology
Faculty Members and Research Interests, 2007

Dr. Chawalit Jeenanunta

**Lecturer**
- B.S. in Computer Science, University of Maryland, USA
- B.S. in Mathematics, University of Maryland, USA
- M.S. in Management Science, University of Maryland, USA
- Ph.D. in Industrial and Systems Engineering, Virginia Polytechnic Institute and State University, USA

**Research Areas:** Linear programming, Integer programming, Network optimization, Simulation, Supply chain management.

**Research Interests:**

**Large-Scale Simulation and Optimization**
Many problems in the real world are large and complex. Researchers in this field are trying to improve the algorithm and utilize available computational technology such as parallelism or grid computing to solve such problems where their resulting models are also very large. This technology also enables researchers to have a detail model which is close to the real world problem. Some examples of these problems are transportation problem in the urban area (where there consists of millions of people driving on thousands of streets), financial simulation, and bioinformatics.

**Supply Chain Management (SCM)**
The researches in SCM involve the study of the process of planning, implementing, and controlling the operations of the supply chain with the purpose of reducing cost and increasing efficiency. SCM includes all movement and storage of raw materials, work-in-process inventory, and finished goods from origin to consumption. There are many problems that can be modeled by simulation and optimization models.

Dr. Jittima Tongurai

**Lecturer**
- B.B.A. in International Business Management, Assumption University, Thailand
- B.Econ. in Monetary Economics, Ramkhamhaeng University, Thailand
- M.Econ. in International Finance, Oita University, Oita, Japan
- Ph. D. of Commerce in Development Finance, Osaka City University, Osaka, Japan


**Research Interests:**

**Asian Monetary and Financial Cooperation**
The 1997 Asian Crisis underscored the interdependence among Asian countries and the importance of regional cooperation in managing the challenges of globalization. Since the Asian Crisis, there have been moves to enhance monetary and financial cooperation – especially among ASEAN+3 countries (ASEAN countries, Japan, China, and South Korea) – through information exchange and policy dialogue, a regional liquidity support facility, and efforts to develop regional bond markets. The research focuses on cooperative efforts in the area of monetary policy and finance. It follows progress in monetary and financial integration in Asia, and scrutinizes empirical evidence on monetary and financial integration. It looks at key issues in limiting possible risks associated with regionalism and possible ways in using integration as a way to reduce vulnerability to external shocks and financial contagion.

**International Capital Flow and Foreign Exchange**
The late 1980s marked the opening era of financial liberalization in developing economies. Capital Controls were abolished, and capital flowed freely across borders. On the one hand, this creates opportunities for developing countries to access international capital for their economic development. On the other hand, financial flows are volatile and herd-like, bringing risks to those developing countries that overly borrow from the international capital market as witnessed in the 1982 Latin American Debt Crisis, the 1994 Mexican Crisis, the 1997-98 Asian Crisis, the 1998 Russian Crisis, and the 2001 Argentinian Crisis. As the key determinant of foreign exchange rates has shifted away from trade flow to financial flow, foreign exchange markets are increasingly volatile. The research looks at evidence on capital account liberalization in developing countries, focusing on the relationship between international capital flow and foreign exchange...
fluctuations. It analyses the means to manage capital flows such as Tobin Tax and Chilean-style capital controls as measures to prevent sudden capital reversal.

Dr. Junalux Chalidabhongse

Assistant Professor
B.Eng. in Computer Engineering, Chulalongkorn University, Thailand
M.S. in Management Science, California State University at Fullerton, USA
M.S. in Engineering-Economic Systems, Stanford University, CA, USA
Ph.D. in Engineering-Economic Systems and Operations Research, Stanford University, CA, USA
Areas of Specialization: Computational organizational modeling, Organizational learning, Organizational decision making, Decision support systems.

Research Interest:

Computational Organizational Modeling

In order to examine how groups, organizations, and societies change over time, the ideas from organizational theory, sociology, psychology, management science, and intelligent systems have been combined to develop a computational model that can be used to represent organizational dynamics. By applying computational models of organizations, the behavior in organizations and the interaction among organizations can be studied and analyzed through the use of computer simulation.

Research on computational organizational modeling is composed of two main components. First, it includes the study to advance understanding of problem-solving in human groups, ranging from small cooperative teams to large-scale, highly-distributed enterprises: organizational decision making, strategic business planning, and adaptive crisis response in organizations. Second, the research includes the development of computer-based technology to support organizational decision making and problem solving. The research focuses on the design, development, and evaluation of computer-based intelligent systems that aid organizational decision-makers in coordinating their efforts to solve complex problems.

Dr. Pisit Chanvarasuth

Lecturer (Joined SIIT in November 2006)
Doctor of Veterinary Medicine, Chulalongkorn University, Bangkok, Thailand
M.B.A. in Finance, Loyola University, Chicago, USA
M.S. in Management Information Systems, Rensselaer Polytechnic Institute, New York, USA
Ph.D. in Management Information Systems, Rensselaer Polytechnic Institute, New York, USA
Areas of Specialization: Information technology management, Electronic business, Supply chain management, Outsourcing, and Management of organizational business process.

Research Interests:

Electronic Business

Globalization and information technologies (IT) are drastically changing the face of business and organizations. We are all experiencing one of the most noticeable changes to our daily lives - the move to an Internet-based society. At present, there is a growing interest in the use of Electronic business as a means to perform business transactions. IT are being adopted and incorporated into nearly all organizations, which have invested heavily in IT infrastructure for the overall success of their businesses. Through using Electronic business, companies are able to connect with their trading partners, which improves their competitiveness globally. Not only does Electronic business create the Web-based businesses, it is the building of a new industrial order. Such a revolution brings a myriad of opportunities as well as risks. Electronic business is an exciting area for research because of its relative novelty and exploding growth.

Business Process Outsourcing

Despite the widespread trends in business process outsourcing, there has been too little focus on what happens to the shareholder wealth and firm value when an organization outsources. Typically, organizations simply lack the means and experiential research to assign value to business processes they are transferring and receiving. That is, they have no real understanding of how new value can be created in business process outsourcing situations, let alone exploited. This is a continuation of my dissertation research which focused on the shareholder wealth effect of business process outsourcing to the firm.
Dr. Pornpimol Chongphaisal

**Lecturer**

B.B.A. in Marketing, Assumption University, Thailand  
M.A. in Comparative Management, Ritsumeikan University, Japan  
Ph.D. in Management, Ritsumeikan University, Japan  
**Areas of Specialization:** Intercorporate relations, Competencies and their applications in Human Resources Management, Organizational Behavior and Development.

**Research Interest:**

**The “Intermediate Form” of Intercorporate Relations**

The traditional ‘make’ refers to a company making its own products whereas ‘buy’ refers to the transaction in the market, has become a problem of the past. Both ‘market’ and ‘organization’ as we know has its own sets of attributes. In making a transaction, a company has to select which is better between the two, taking into consideration the attributes and costs underlying each of them. A large diversified organization has the internal market for the goods, internal capital market, and internal labor market. Transactions in the middle range has been labeled differently as ‘hybrid transactions’, and ‘mixed coordination systems’. Dr. Pornpimol’s focus is on the study of these ‘intermediate forms’ which is not quite a complete integration into a single firm, but not quite an exchange between two separate firms in markets either. Firms may form links or bonds of a long term, ‘relational’ nature, through which they become interdependent for business. The study covers not only the intercorporate shareholding and interlocking directorates but includes cases where the buyer may own tools used by the supplier or cases where there may be intensive technology transfer or sharing of technical and managerial knowledge between firms. The transaction efficiency, stemming from such a relationship, enables the parties involved to realize the reduction of production cost and transaction costs or its combination. Dr. Pornpimol observed the relationship between the cohesiveness of intercorporate relations and the reduction of transaction costs of a business group in Thailand and compared it with those of Japan. Social network analysis is employed to quantitatively measure and compare intercorporate shareholdings of the objects of study to understand the changes of these relationships over time. The results implied by quantitative measurement are examined and logically explained in terms of the effects to the reduction of transaction costs.

Dr. Somrote Komolavanij

**Associate Professor**

B.Eng. in Chemical Engineering, Chulalongkorn University, Thailand  
M.S. & Ph.D. in Industrial Engineering, University of Texas at Arlington, USA  
**Areas of Specialization:** Engineering economy, Quality control, and Operations research.

**Research Interests:**

**Applications of Fuzzy Sets Theory to Industrial Problems**

The theory of fuzzy set was proposed in the early 1960s. It is suitable for applying to a problem where uncertainty is presented. The uncertainty can be the uncertainty of the data or the uncertainty of controlling rules. For example, capital budgeting problems usually require a lot of data for doing analysis and most of the data has to be estimated as it is future data. Examples of such data are many kinds of costs, interest rates and expected profit of the particular project, etc. Therefore, there will be uncertainty presented during the estimation process. For the uncertainty of controlling rules, fuzzy set theory can be used as the fuzzy decision-criteria to control the machine or the process to operate more efficiently or more economically.

**Engineering Economy**

Engineering Economy is the process that involves guidelines used for evaluating alternatives of investments. The research in this area will focus on the topics of investment analysis, replacement analysis, and mutually exclusive alternatives selections. Both deterministic and probabilistic capital budgeting models will be investigated.

**Operations Research**

The main purpose of research in this area is to minimize the cost or maximize the profit of what we are investigating. Mathematical models are used to represent the situation of the problem. They can be linear programming, non-linear programming, integer programming, dynamic programming model or job assignment model. After the type of model is selected and the model is developed, the optimal solution can be obtained by solving the model.

**Quality Control**

The application of quality control tools to improve the process is the main interest in this area. The research will include the application of Statistical Process Control (SPC), Sampling Plan, ISO 9000 and ISO 14000.
Dr. Suebsak Nanthavanij

Associate Professor
B.S. in Chemical Engineering, Chulalongkorn University, Thailand
M.S. & Ph.D. in Industrial Engineering, University of Texas at Arlington, USA
Areas of Specialization: Industrial ergonomics, Workforce scheduling, Industrial noise.

Research Interests:

Performance Analysis of Ergonomics-based Manual Assembly Line with Parallel Workstations and Floaters

It has been long known that manual assembly tasks are repetitive and require the use of specific muscles in the upper extremities, creating excessive postural and physical loads on the excessively used body members. As a result, manual assembly line workers are at high risk of cumulative trauma disorders in the upper extremities. When ergonomics concerns are introduced to the manual assembly line balancing problems to assign assembly tasks to workers to achieve the maximum postural-physical loads smoothness, the resulting task-workstation assignment solution must be determined using an ergonomics-based approach. Unfortunately, the line throughput is likely to decrease since the balance delay of the line might be compromised. This research project is intended to investigate the effect of adding parallel workstations to some potential bottleneck workstations and providing floaters (or extra helpers) to those parallel workstations so as to increase the assembly line productivity. Additionally, several strategies for opening parallel workstations and rotating floaters among them will be investigated with respect to various desired throughput rates. The Rapid Upper Limb Assessment (RULA) technique will be used to assess the postural and physical loads imposed on the musculoskeletal system of the body when performing each manual assembly task. A heuristic procedure will be employed to assign assembly tasks to workstations using a mixed productivity and ergonomics consideration. Based on predefined dispatching strategies to assign floaters and rotate them among parallel workstations, simulation models will be developed. The performance of the given manual assembly line under different throughput rate requirements and operational conditions will be analyzed. The variables of interest include: throughput rate, number of full-time workstations, number of parallel workstations, number of floaters, dispatching strategy, and switchover strategy. The performance indices are: achieved throughput rate, balance delay, utilization rates of full-time and parallel workstations, switchover rates, and average queue lengths at full-time workstations.

Ergonomics-based Workforce Scheduling for the Vehicle Routing Problem

The vehicle routing problem is intended to determine the optimal number of vehicles to delivery goods between finite sets of origins and destinations, and their delivery routes. There are numerous variants of the vehicle scheduling problem that have been studied by operations research and industrial engineering researchers. However, very few (if any) have paid attention to the vehicle drivers. In real-world situations, vehicle drivers might not only drive delivery vehicles but also perform loading and unloading of goods at both the origins and destinations. With limited time windows, loading/unloading operations may require more than one person to perform. Moreover, long-distance driving is stressful and increases the risk of highway accidents. Alternate drivers may be required for certain delivery routes. This research project is intended to take the loading/unloading workload and long-distance driving into consideration when finding the optimal workforce schedule for the vehicle routing problem. Based on the given delivery loads (in terms of required energy costs) and the driving distances for individual delivery trucks, a heuristic approach will be developed to determine the minimum numbers of vehicles and operators (drivers and movers) and their delivery routes so as to minimize the total traveling distance without exceeding the recommended daily energy expenditure and driving distance.

Workforce Scheduler: An Ergonomic Manpower Management Tool

This research project is intended to develop a computerized tool called Workforce Scheduler for ergonomically managing manpower for a hazardous work system. A group of industrial workers will receive daily work assignments to operate/attend a set of machines/workstations in the workplace where ergonomics, safety, and health hazards are present. Job rotation will be implemented to alleviate the workers’ hazard exposures. The types of hazard considered in Workforce Scheduler include industrial noise, heat, over-exhaustion, over-exertion, and toxic gases. Workers may be considered as identical or non-identical receivers, depending on the type of hazard and body tolerance. Workforce Scheduler allows the user to choose between the single-hazard exposure option and the two-hazard exposure option. The permissible daily exposure level must be specified prior to the workforce scheduling. Workforce Scheduler will determine the daily work assignment for each worker such that his/her hazard exposure does not exceed the permissible level. Additionally, the weekly work schedule for the worker can be set so that his/her daily hazard exposures for different workdays will not be the same.
Dr. Veeris Ammarapala

**Lecturer**

B.Eng. in Industrial Engineering, Sirindhorn International Institute of Technology, Thammasat University, Thailand  
M.Sc. in Operations Research, Columbia University, USA  
Ph.D. in Industrial and Systems Engineering, Rutgers University, The State University of New Jersey, USA  
Areas of Specialization: Decision Support Systems; Risk Management, Economic Analysis.

**Research Interests:**

**Decision Support Systems**

Decision Support Systems (DSS) are a specific class of computerized information system that supports business and organizational decision-making activities. A properly designed DSS is an interactive software-based system intended to help decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

**Risk Management**

Risk is the net negative impact of the exercise of vulnerability, considering both the probability and the impact of occurrence. Risk management is the process of identifying risk, assessing risk, and taking steps to reduce risk to an acceptable level.

It is critical for any organization to establish a foundation for the development of an effective risk management program, containing both the definitions and the practical guidance necessary for assessing and mitigating risks identified within the organization. The ultimate goal is to help organizations to better manage mission-related risks.

**Economic Analysis**

Economics is a social science that typically studies the production, distribution, and consumption of goods and services. Economic logic is increasingly applied to any problem determining economic value (such as politics, religion, psychology, history and engineering).

Economic analysis is a systematic approach to a given program, designed to assist the management in solving a problem of choice. The full problem is investigated. Objectives and alternatives are searched out and compared in light of their benefits and costs through the use of an appropriate analytical framework.
School of Manufacturing Systems and Mechanical Engineering

Faculty Members and Research Interests, 2007

Dr. Bundit Limmeechokchai

Associate Professor

- B.Eng. (1st Class Honors) in Mechanical Engineering, King Mongkut's Institute of Technology North Bangkok
- M.Eng. in Energy Technology, Asian Institute of Technology (AIT), Thailand
- D.Eng. in Energy Economics and Planning, Asian Institute of Technology (AIT), Thailand

Areas of Specialization: Energy conservation and energy management, Demand-side management, Integrated resource planning, Modeling of energy and environment systems.

Research Interests:

**Energy Conservation and Efficiency Improvement**

Energy management is the effective use of energy to maximize profits (minimize costs). A comprehensive energy management program is not purely technical. It takes into account planning and communication as well as marketing. Energy management includes energy productivity and energy awareness. In Thailand, energy management in buildings and industries is necessary to the country, as an energy importing country. The state has implemented energy-conservation policies and measures for close to 20 years with little evidence of success. On the other hand, the energy consumption and GDP per capita in constant 1980 US$ from 1973 to 2000 are highly correlated with an elasticity of 1.12, which shows energy-consumption growth. The Energy-Conservation Promotion (ECP) Act was passed in 1992 and has been implemented since 1996 with one objective being the promotion of energy efficiency in buildings and industries.

**Integrated Resource Planning and CO₂ Mitigation**

Traditionally, the method used in the power expansion process is to identify the sequence of generation additions which results in supplying the forecast load at the minimum overall costs, which has concentrated almost exclusively on supply-side options. However, the saving of electricity through a demand side management (DSM) program is equivalent to building a new power generating unit. This concept is known as integrated resource planning (IRP). Therefore, the DSM programs are evaluated in the IRP process. In addition to energy efficiency improvement from IRP, CO₂ emissions and other pollutants are mitigated.

Dr. Jirachai Buddhakulsomsiri

Assistant Professor

- B.Eng. in Chemical Engineering, Chulalongkorn University, Thailand
- M.S. in Industrial Engineering, Oregon State University, USA
- M.S. in Statistics, Oregon State University, USA
- Ph.D. in Industrial Engineering, Oregon State University, USA

Areas of Specialization: Applied operations research, Data mining, Production planning and control, Systems simulation, and Engineering economics analysis.

Research Interests:

**Applied Operations Research**

The main focus is to effectively and efficiently solve application problems using existing, modified (if needed), or newly developed optimization tools (i.e. mathematical programming models, heuristic methods). Various applications of interest include, but are not limited to, 1) resource-constrained project scheduling problems in project management; 2) parallel replacement problems in engineering economic decision analysis; 3) vehicle routing, facility location, and supply chain optimization in logistic and supply chains, and 4) production planning and controls in manufacturing plants.

**Data Analysis for Process/Product Optimization and Improvement**

Process and product can be optimized or improved by using the information contained in the process data. Data analysis tools of interest include statistical data analysis, design and analysis of experiments, statistical process control, statistical sampling, and data mining.

**Systems Simulation Modeling and Analysis**

This research area involves modeling of actual and large complex systems using computer simulations and conducting analyses on the simulation models. The objectives are to study and predict the behavior of actual systems, to improve the performance of existing systems, or to design new systems.
Dr. Lalita Tantimuratha

**Assistant Professor**
B.Eng. in Chemical Engineering, Kasetsart University, Bangkok, Thailand
M.Sc. in Process Integration, University of Manchester Institute of Science and Technology (UMIST), UK
Ph.D. in Process Integration, UMIST, UK

**Area of Specialization:** Heat Recovery Network.

**Research Interest:**
With consideration on energy savings and efficient use of energy, research interests are in the area of heat recovery network design. The concept of pinch technology is applied with mathematical programming to obtain heat recovery systems. Apart from more efficient use of energy, the systems should also be economically designed. Operability and flexibility of heat exchanger networks (HEN) are also considered. Methodologies and optimisation models for HEN design are required for simpler, more practical, and flexible networks. Optimisation and design of heat exchanger networks in synthesis and retrofit problems are both of interest. Interesting researches are also the applications of developed methodologies on industrial problems in Thailand.

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Dr. Navee Chiadamrong

**Associate Professor**
B.Eng. in Industrial Engineering, Chulalongkorn University, Thailand
M.Sc. in Engineering Business Management, University of Warwick, UK
Ph.D. in Manufacturing Engineering and Operations Management, University of Nottingham, UK

**Areas of Specialization:** Cellular manufacturing systems (CMS), Advanced manufacturing systems, Systems simulation, Production planning and control, Supply chain management.

**Research Interests:**
Simulation Modelling and Analysis

Simulation is one of the most powerful analysis tools responsible for the design and operation of complex systems. Simulation involves the modelling of a process or system in such a way that the model mimics the response of the actual system to events that take place over time. The model can be used to predict future behaviour and the effects produced by changes in the systems or in its method of operation.

Cellular Manufacturing Systems (CMS)

CMS is another form of manufacturing system which applies the concept of group technology to provide some of the operational advantages of a flow shop while maintaining some of the strategic advantages of the job shop. Many research areas are involved in the concept including different types of cell formation and production planning for controlling the operation within and among the cells (inter-cell workload transfer).

Production Planning and Control (PPC)

Production planning uses the information from product and sales planning to plan the aggregate rates of production and the inventory levels. The objective of production planning is to provide sufficient finished goods in a period to meet the sales plan objectives while staying within financial and production capacity constraints. It is one of the richest areas that still require further research.

Economic and Strategic Justification Methods

The main objective of justification processes is to justify an investment to see whether or not it is worth investing. However, in justifying new manufacturing technologies, traditional justification methods, with their overemphasis on short-term savings, cause these projects to be rejected while others fail to come up to expectation. Many forms of the integration of economic analysis which provides results in monetary terms with strategic analysis showing results from evaluator rating of his or her subjective feeling are an interesting area for further research.

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Dr. Pisal Yenradee

**Associate Professor**
B.Eng. (1st Class Honors) in Production Engineering, King Mongkut's Institute of Technology North Bangkok
M.Eng. & D.Eng. in Industrial Engineering and Management, Asian Institute of Technology (AIT), Thailand

**Areas of Specialization:** Production and Inventory Control (P&IC) systems, JIT, MRP, and TOC; P&IC systems for Thai industries; Applied Operations Research; Supply Chain Management.

**Research Interests:**
Small- to medium-sized industries (SMIs) in Thailand face considerable production and inventory control (P&IC) problems. These problems greatly deteriorate the manufacturing competitiveness of SMIs. In order
to alleviate the problems, their characteristics and causes should be analyzed. Some causes of the problems are manageable while others are non manageable. The non-manageable problems must be considered as constraints for developing the P&IC systems. The P&IC systems suitable for the SMIs in Thailand should be developed based on these constraints. Particular research topics in this research area are listed as follows:

Analyses of Production and Inventory Control Problems in Thai Industries

There are various possible problems related to the production and inventory control (P&IC) systems in Thai industries. The nature, characteristics, and causes of such problems should be known in order to design an appropriate P&IC system or to improve the performance of the system. This research aims to identify the characteristics and also real causes of the encountered P&IC problems in Thai industries using an interview survey and case studies.

Guideline or Methodology for Developing the Appropriate P&IC System for Thai Industries

It is reasonable to assume that the situation of industries in developed and developing countries are different. Therefore, the P&IC systems widely used in developed countries, for example, Just-in-Time, MRP, and TOC (Theory of Constraints) may not be suitable for Thai industries. An entirely new system or a modification of certain existing systems may be required by Thai industries. This research aims to recommend P&IC techniques or systems suitable for Thai industries by focusing on aggregate planning, master production scheduling, detailed production and purchasing scheduling, and shop floor control.

Affordable MRP System for Small- to Medium-Sized Industries (SMIs) in Thailand

Material Requirement Planning (MRP) software packages available in the market at present are very expensive and may be unaffordable by SMIs in Thailand. The software is designed as a general tool to be applicable for almost all types of industries. It is therefore complicated and difficult to use. This research aims to design various MRP systems (having different planning logics) which are appropriate for different types of SMIs in Thailand. Since the MRP systems are specifically developed (not a general-purpose one) for each type of industries, they are therefore less complicated, easier to use, and more affordable.

Dr. Ruengsak Kawtummachai

Associate Professor
B.Eng. (1st Class Honors) in Industrial Engineering, Chiang Mai University, Thailand
M.Eng. in Mechanical Engineering, Okayama University, Japan
Ph.D. in Production System, Okayama University, Japan
Areas of Specialization: Scheduling, Production planning and control, Just-in-time production, Inventory control, Production system, Supply Chain, Logistics.

Research Interests:

Inventory Control

This field of study is concerned with the management of inventory level. There are so many strategies that have been applied in this field, such as, MRP, MRP II, JIT, etc. MRP may be the most appropriate method for a particular firm but may be a poor one for other companies. The aim of this field of study is to select the most appropriate method of inventory control under the constraints of a system. The most recent study is concerned with a hybrid system JIT/MRP. This idea combines the philosophy of JIT into the system of MRP to construct a better method when compared to the inventory system controlled by only JIT or MRP.

Heuristic Scheduling Algorithms

Scheduling (or Sequencing) is a topic that is well known for its complexity. It requires a huge amount of effort to solve this major problem and sometimes there is no method for solving such a problem to obtain the optimal solution. Heuristic scheduling algorithms such as Simulated Annealing and Genetic Algorithm can be used to seek the near optimal solution when calculated by a high-speed computer. The study will construct an algorithm that is suitable and satisfies the constraints of the concerned problems.

Supply Chain Management

A Supply Chain is a cluster of companies cooperatively interacting with each other to fulfill a production goal in response to customers’ orders. A well-organized supply chain will gain a competitive advantage and benefit all partners in the supply chain. Issues of supply chain management include: statistical forecasting, collaborative demand planning, product life cycle planning, multi-plant MRP/MPS, constrained production planning, supply and distribution network modeling, supply network optimization and vendor managed inventory. One of the key issues in supply chain management is to identify the most profitable supply chain in which all partners in the chain can gain a win-win situation.
Dr. Satha Aphornratana

**Associate Professor**
B.Sc. in Mechanical Engineering, Prince of Songkhla University, Songkhla, Thailand
M.Eng. in Mechanical Engineering, University of Technology, Sydney, Australia
Ph.D. in Mechanical Engineering, University of Sheffield, England
Area of Specialization: **Refrigeration system.**

Research Interest:

**Heat Powered Refrigeration Cycles**

A refrigeration system is a thermodynamics cycle that removes heat from an enclosed space, or from a substance, and rejects it out to the surrounding at a higher temperature. In most refrigeration systems, the liquid refrigerant is evaporated at a low pressure and is condensed back to liquid at a higher temperature. The refrigerant can absorb heat at a low temperature during the evaporation process and condense back to liquid by rejecting heat out to the surrounding during the condensation process. Many types of refrigeration systems have been invented. The most common system used is known as "a vapor-compression refrigeration system". In this system, the elevation of the refrigerant pressure is achieved by means of a mechanical compressor. This system is operated using electrical energy input to the mechanical compressor. Therefore it is known as a worked-operated refrigeration system.

Dr. Supachart Chungpaibulpatana

**Associate Professor**
B.Sc. (Honors) in Mechanical Engineering, Prince of Songkhla University, Songkhla, Thailand
M.Eng. & D.Eng. in Energy Technology, Asian Institute of Technology (AIT), Thailand
Areas of Specialization: **Thermal engineering, Solar energy, Energy conservation and management.**

Research Interests:

With a background in mechanical engineering and energy technology, research activities and interests include both energy equipment design, development and applications, as well as energy system planning and management.

**Energy conservation and management** in industries and in large commercial buildings in Thailand is an area which still needs a lot of research. The main topics include energy analysis of potential savings, thermal energy storage (cool/ice storage) for air-conditioning system, cogeneration system for industries which require both heat and electricity simultaneously, industrial waste heat recovery and evaporative cooling.

The transportation sector accounts for about 45% of total energy demand in Thailand and, in addition, fuels used are mainly from imported petroleum. This not only affects the country economy but burning fossil fuels also produces air pollution as well as CO₂ which is a main greenhouse gas emission. Research topics under investigation include the development of Bangkok driving modes for various types of vehicles, assessment of the use of catalytic converters in gasoline cars, and the effects of using vegetable oils in diesel engines.

Another field of research to be mentioned is concerned with **solar energy;** both thermal and electrical applications. Interesting topics under consideration are the design and development of low cost solar water heaters using local materials, solar-photovoltaic refrigerators for use in remote areas where electricity from the utility grid is not available, modeling of solar PV/thermal systems under various types of applications, development of standard methods for testing solar energy equipment, software packages for optimum sizing of solar energy systems.
Dr. Thananchai Leephakpreeda

**Associate Professor**
B.Eng. in Mechanical Engineering, Chulalongkorn University, Thailand  
M.S. & Ph.D. in Mechanical Engineering, The University of Akron, Ohio, USA  

Researc Interest:

**Mechatronics in Application-oriented Control**

The primary research interests cover mechatronics in application-oriented control for practical implementation in process modeling and control as well as design and optimization. The current topics include optimal control for air condition, and novel techniques for computational intelligence in system and control engineering, etc.

Dr. Vladimir I. Kuprianov

**Associate Professor**
Honors Diploma of Engineer (Equiv. to B.Eng. & M.Eng.) in Mechanical Engineering, Moscow Power Engineering Institute (MPEI), Russia  
D.Eng. in Steam Boilers & Steam Generators, MPEI, Russia  
Areas of Specialization: Thermal power plants; Boiler and furnace technology; Combustion and emission control in boilers fired with fossil fuels; Fluidized bed combustion (FBC) of biomass residues and wastes; Assessment of environmental impacts by thermal power plants and FBC systems.

Research Interests:

**Analysis and Improvement of Thermal Efficiency and Environmental Performance of Boiler Units**

In many countries, fossil fuels of relatively low quality (e.g. lignite) and/or high-calorific fuels with elevated contents of fuel-S and fuel-N are used for power generation. Such a situation results in significant environmental impacts by the pollutants discharged from the boilers of different power plants. Implementation of least-cost methods for the improvement of thermal efficiency and environmental performance of operating utilities seems to be the most attractive way for energy conservation as well as mitigating environmental impacts by the power producers. Research works relevant to this objective include various aspects, such as: (1) exploring technological options for the improvement of the thermal efficiency and environmental performance of existing boiler units; (2) optimization of key operating variables affecting the combustion process in the boiler furnace when firing distinct fuels and/or fuel blends; (3) optimal load dispatching over the boiler units of a power plant. Additionally, through modeling the emission rates of different pollutants (NOx, CO2, CO, SOx, PM, trace elements) discharged from distinct boiler units, reliable data for the assessment of environmental impacts by a power plant can be obtained for various fuel options taking into account actual unit operating conditions and power outputs.

**Development and Study of Fluidized Bed Combustion Systems for Firing Biomass Fuels**

Biomass is one of the major primary energy sources in Thailand. Residues and wastes collected on a large scale from agricultural and forest-related activities such as rice, sugar, wood and palm oil industries can be used (alternatively to fossil fuels) as energy sources for heat and power production in this country. Thus, the development of highly efficient, reliable and environmentally friendly technologies for biomass utilization with the aim of energy production, is a problem of paramount importance for the Thai energy sector. Due to some advantages, fluidized bed combustion technology seems to be the most suitable for energy conversion of biomass. Conical fluidized-bed combustors of various modifications have been proposed and are being studied. The research objectives include: (1) investigation of fluidization characteristics of the bed material in conical prototypes; (2) study of the effects of fuel and bed material types as well as operating conditions (including air staging) on the combustion efficiency and emission characteristics of the combustor; (3) study of the physical and chemical factors affecting formation and reduction of major pollutants in the combustor; (4) optimization of the combustor design and its operating conditions; (5) assessment of environmental impacts for various biomass fuels; (6) study on co-firing of different biomass fuels and/or co-firing of biomass with coal in a conical fluidized bed.
Department of Common and Graduate Studies
Faculty Members and Research Interests, 2007

**Dr. Alice Sharp**

**Assistant Professor**
B.Sc. in Biology, Chiang Mai University, Thailand  
M.Sc. in Environmental Risk Assessment, Chiang Mai University, Thailand  
M.Sc. in Natural Resource Management, Hiroshima University, Japan  
Ph.D. in Natural Resource Management, Hiroshima University, Japan  
**Areas of Specialization:** Community based natural resource management, Environmental Impact Assessment, Pollution monitoring.

**Research Interests:**

**Community Based Environmental Protection (CBEP)**

CBEP is a new approach to environmental protection. Traditionally, environmental protection programs have focused on the command and control approach, which have been very effective at reducing point source pollution and improving environmental quality. However, some environmental problems, such as non-point source pollution are less amenable to these programs. CBEP will supplement and complement the traditional environmental protection approach by focusing on the health of an ecosystem and the behavior of humans that live in the ecosystem’s boundaries. This study is aiming to 1) comprehensively identify local environmental concerns, 2) set priorities and goals that reflect overall community concerns, and 3) develop comprehensive, long-term solution to environmental problems.

**Products Life-Cycle Assessment (LCA)**

Life-cycle assessment (LCA) is used to quantify the environmental inputs and outputs of a product or process, from the mining of raw materials, through production, distribution, use and reuse or recycling, to final disposal. There are two main stages of LCA: inventory analysis and impact assessment. Inventory analysis involves the quantification of environmental inputs and outputs throughout a product or process’s lifetime. The inventory analysis is aiming to identify a list of pollutants that may have an impact on the environment. The purpose of the impact assessment is to aggregate and evaluate the potential environmental impacts identified in the inventory. This study will be focusing on particular kinds of waste which have high potential to be a major environmental problem in the future, mobile phone and its batteries, as an example in order to develop waste management plan and minimize the amount of waste before hand.

**Waste Management**

Waste management is one of the major long-term problems in our society. Cost-effective, environmentally sound management of wastes continues to be an unstable issue, the solution of which must integrate science, technology, individual awareness, and policy. Waste management begins with understanding the complete and detailed physical, chemical, and biological characteristics of the waste in question. This understanding is crucial to successful utilization or environmentally sound disposal measures. Additionally, waste management enables us to predict what is in a material, how much is there, how it may leach out, and how it will ultimately impact the environment.

**Dr. Jeffrey Frank Webb**

**Assistant Professor (Joined SIIT in October 2006)**
B.Sc. (Honors) in Applied Physics, Portsmouth University, England, UK  
Ph.D. in Physics, University of Strathclyde, Scotland, UK  
**Areas of Specialization:** Theoretical studies of bulk and thin-film properties of ferroelectric materials; Linear and non linear optics of ferroelectrics, Nanotechnology and nanoscience: Theoretical studies and modelling of nanostructures such as quantum dot and wire structures; Nanoscale device modelling.

**Research Interests:**

**Ferroelectric Materials**

Phenomenological studies of ferroelectric materials using Landau-Devonshire-Ginzburg theory: The basis of this theory is that the free energy can be expanded in powers of the order parameter (often taken to be the polarization). Bulk properties are easily handled with this approach, and by adding a gradient term to the free energy, finite size effects can also be studied. For example, the way that a thin-film ferroelectric influences the ferroelectric properties can be studied. This is of increasing importance technologically because of the use of thin-film ferroelectrics in ferroelectric random access memories.
Both linear and nonlinear optical properties of ferroelectrics can also be studied in the framework of this phenomenological theory by introducing Landau-Khalatnikov equations to model the dynamical interaction of a ferroelectric material with an incident electromagnetic beam. The resonance frequency of ferroelectrics is in the infrared; linear far infrared spectroscopy can be used as a probe of the thin-film properties of ferroelectrics. Many interesting nonlinear effects can also arise. Important applications in this area are terahertz wave devices, tunable infrared sources, and parametric amplifiers.

**Nanotechnology and Nanoscience**

This is currently one of the most exciting areas of research, with great promise for future technologies.

**Dr. Pakorn Opaprakasit**

**Assistant Professor**

B.Sc. (1st Class Honors) in Chemistry, Chiang Mai University, Thailand.

M.S. in Materials Science and Engineering (Polymer Option), the Pennsylvania State University, Pennsylvania, USA.

Ph.D. in Materials Science and Engineering, the Pennsylvania State University, Pennsylvania, USA.

**Areas of Specialization:** Infrared spectroscopy, Rapid prototyping, Natural rubber, Biocompatible/biodegradable polymers, Lactide-based polyesters, Coal/fossil fuels, Biodiesel.

**Research Interests:**

**Properties Enhancement of Polylactide and Natural Rubber for Multicolor Articles Rapid Prototyping**

The work is aiming to enhance properties of polylactide and natural rubber, and to setup a processing methodology to manufacture multicolor articles from the two economically significant raw materials of Thailand. Rapid prototyping (RP) is employed to reduce design and development time by fabricating parts layer-by-layer. Natural rubber is used in latex form, while polylactide is applied in powder form. Various properties of these materials are modified to be used in the RP process. Mixing behavior of colorants and base materials (polylactide and natural rubber) is also investigated to develop an in-process technique of producing colored parts.

**Thermal Properties and Degradation of Polylactide**

Polylactic acid or polylactides (PLA) are well known as a biodegradable and biocompatible thermoplastic and are of interest in various medical applications. Their enzymatic degradability and mechanical properties, which are comparable to those of PE and PS, have also attracted interest in using these degradable polymers as packaging materials. Most importantly, the monomer constituents of these polymers can be derived from agricultural resources such as carbohydrates. A racemic crystal structure or stereocomplex can be achieved by mixing two polylactides with opposite configurations: poly L-lactide (L-PLA) and poly D-lactide (D-PLA). This stereocomplex, in turn, shows a higher melting temperature than that of its homopolymer counterpart. Accordingly, this stereocomplex has been used as a potential high performance biodegradable material. Current research is focused on the mechanism and dynamics of crystallization and degradation processes of these polylactides and their stereocomplex.

**Conventional and Two-Dimensional FTIR Spectroscopy**

Infrared spectroscopy is a fundamental analytical technique that is widely used in material characterization. Recently, an advanced methodology, two-dimensional infrared spectroscopy (2D-FTIR) has been developed as a novel data analysis and presentation technique. This technique has provided notable advantages over conventional FTIR. For example, an improvement in band resolution, simplicity in band assignment, and determination of relative order of responses of specific functional groups to external perturbation, have been achieved. The 2D-FTIR has been applied to study effects of mechanical and electrical perturbations on the structural transition of PVDF/TrFE/CTFE piezoelectric polymer, and investigate crystallization of biodegradable polymer or polylactide.
Dr. Ruben N. Mera

Assistant Professor
B. Math, University of the Republic Montevideo, Uruguay
M.Sc. Mathematical Statistics, CIENES, Santiago, Chile
D.E.A. Probability, University of Paris VI, France
Ph.D. Mathematics, Auburn University, Alabama, USA
Areas of Specialization: Complex-survey designs, Complex variables.

Research Interests:

Complex-Survey Designs and Estimation
A complex-survey design incorporates elements such as stratification, clustering, unequal inclusion probabilities, and weighting, among others. Under a complex design, observations do not follow the standard assumptions of Independent Identically Distributed (IID) observations of classic statistical analysis. Missing values induce bias, and imputation contributes to inflate variances. The way these different factors interact is not well known. Survey designs must integrate all the components of the population structure. Estimation and variance estimation must account for all the complexities of the design.

Disclosure Avoidance
Government agencies are required to protect respondents’ confidentiality, both to comply with law requisites as well as to insure an accurate data collection. The public release of microdata prompts the risk of identification of a respondent by a third party. Masking techniques, such as data disturbance or swapping, to avoid the linking of observations to respondents, are typical methods to prevent identity disclosure. Masking procedures, however, distort the data and induce bias. The challenge is to produce public data files that are representative of the population and, at the same time, insure the respondents’ privacy.

Best Polynomial Interpolation
The field of polynomial interpolation and approximation has been exhaustively investigated in the past. Diverse methods were developed for constructing polynomials such that the polynomial and some of its derivatives agree on a set of given points with the values of the function and its derivatives. The choice of the points to obtain the best approximating polynomial, however, has not been explored in detail. Research on the best approximating polynomial is, therefore, of interest to pursue.

Dr. Thawatchai Onjun

Assistant Professor
B.S. in Physics, University of Rochester, Rochester, New York, USA
M.S. in Physics, Lehigh University, Bethlehem, Pennsylvania, USA
Ph.D. in Physics, Lehigh University, Bethlehem, Pennsylvania, USA
Areas of Specialization: Theoretical and computational plasma physics.

Research Interest:

Theoretical and Computational Plasma Physics
Fusion-related research with focus on thermal and particle transport such as predicting the time evolution of temperature and density profiles in tokamaks using an integrated modeling approach. Integrated modeling is an important element of tokamak fusion research that contributes in an essential way to the interpretation and planning of experiments, validation of theory against experimental results, development of plasma control techniques, and the design of next step devices such as ITER. Research is closely related to ongoing and proposed experiments at major fusion laboratories.
SIIT Directory

Executive Committee

1. Prof. Dr. Sawasd Tantaratana  
   Acting Director of SIIT.
2. Prof. Dr. Somnuk Tangtermsirikul  
   Deputy Director of SIIT.
3. Assoc. Prof. Dr. Winyu Rattanapitikon  
   Executive Assistant Director for Rangsit Campus.
4. Assoc. Prof. Dr. Ekawit Nantajeewarawat  
   Executive Assistant Director for Bangkadi Campus.
5. Assoc. Prof. Dr. Amorn Pimanmas  
   Assistant Director for Special Affairs.
6. Assoc. Prof. Dr. Ruengsak Kawtummachai  
   Assistant Director for Student Affairs.
7. Asst. Prof. Dr. Pakorn Opaprakasit  
   Assistant Director for Admission and Public Relations.
8. Asst. Prof. Dr. Alice Sharp  
   Head, Department of Common and Graduate Studies (CGS).
9. Asst. Prof. Dr. Luckhana Lawtrakul  
   Acting Head, School of Bio-Chemical Engineering and Technology (BCET).
10. Assoc. Prof. Dr. Pruetsa Nanakorn  
    Head, School of Civil Engineering and Technology (CET).
11. Asst. Prof. Dr. Chalie Charoenlarpnopparat  
    Head, School of Communications, Instrumentations and Control (CIC).
12. Assoc. Prof. Dr. Thanarak Theeramunkong  
    Head, School of Information and Computer Technology (ICT).
13. Assoc. Prof. Dr. Somrote Komolavanij  
    Head, School of Management Technology (MT).
14. Assoc. Prof. Dr. Navee Chiadamrong  
    Head, School of Manufacturing Systems and Mechanical Engineering (MSME).
15. Ms. On-Anong Suraniranat  
    Head of Library and Information Services Center;  
    Member and Secretary of the Committee.

Adjunct Faculty Members - Graduate Programs

Dr. R.H.B. Exell  
Professor,  
King Mongkut's University of Technology Thonburi,  
Thailand;  
Professor Emeritus,  
Asian Institute of Technology (AIT), Thailand.  
BA Oxford University, UK  
MA Oxford University, UK  
DPhil Oxford University, UK

Dr. Yongwimon Lenbury  
Professor,  
Mahidol University, Thailand.  
BSc Australian National University, Australia  
MSc Australian National University, Australia  
PhD Vanderbilt Tennesse University, USA

Instructors

Academic Year 2007

School of Bio-Chemical Engineering and Technology

Dominica Del Mundo Dacera (Half-time)  
BSChE Chemical Engineering, Mindanao State University, Marawi City, Philippines.  
MEng Environmental Engineering, Asian Institute of Technology, Pathum Thani, Thailand.

School of Civil Engineering and Technology

Krittiya Kaewmanee (Half-time)  
BEng Civil Engineering, Sirindhorn International Institute of Technology, Thammasat University, Thailand.  
MEng Civil Engineering, Kochi University of Technology, Japan.
School of Manufacturing Systems and Mechanical Engineering

Lalith Niroshana Wickramaratna (Full-time)
BEng Mechanical Engineering, University of Peradeniya, Sri Lanka.
MEng Energy Technology, Asian Institute of Technology, Pathum Thani, Thailand.

Department of Common and Graduate Studies
English Training Unit

Clement A Trahan, Full-time English Instructor
BSc Secondary Education, Old Dominion University, Norfolk, Virginia, USA.
BA Business, University of Guelph, Guelph, Ontario, Canada.
MA Education, Rockville University, Rockville, New York, USA.
TEFL Teaching English as a Foreign Language, Frankfurt, Germany.

Dr. Egill H. Bragason, Full-time English Instructor
BA Psychology, University of Iceland, Iceland.
MS Work and Organizational Psychology, Institute of Psychology, University of Aarhus, Denmark.
PhD Work and Organizational Psychology (Specializing in Industrial Psychology), Institute of Psychology, University of Aarhus, Denmark.

Paul V Neilson, Full-time English Instructor
BS Chemistry, California Polytechnic State University (SLO), USA.
MS Chemistry, California Institute of Technology (CALTECH), USA.
Certificate TEFL, by Internet.

Terrance J Downey, Full-time English Instructor
BA Humanities, Harvard University, Cambridge, MA, USA.
MA Humanities, San Francisco State University, San Francisco, CA, USA.

Thanh na Nagara, Full-time English Instructor
BA History and Political Science, University of Otago, Dunedin, New Zealand.
MA History, University of Otago, Dunedin, New Zealand.
Grad Dip TESL, Victoria University of Wellington, Wellington, New Zealand.

William David Booth, Full-time English Instructor
BA History, The Citadel in Charleston, South Carolina, USA.
MA Liberal Studies/History, The State University of New York, Plattsburg, New York, USA.
AA Accounting, The Chippewa Valley Technical College, Wisconsin, USA.
Certified through the U.S. Peace Corps as a TEFL Instructor.
Course Work through Chiang Mai University, Thailand in Teaching English through Drama.

Chiefs of Divisions and Sections
SIIT at Rangsit

SIIT-Tel: +66 (0) 2986 9009, 2564 3221-9; SIIT-Fax: +66 (0) 2986 9112-3

Director Office
Ms. Ajarathorn Indasorn ☎ ext. 1104 Secretary for Executive Affairs
Ms. Aroonkomal Imsuangan ☎ ext. 1108 Secretary
Mr. Wasinee Meekul ☎ ext. 1301 SIIT Internal Auditor

Academic Services Division
Ms. Naree Moolsawas ☎ ext. 1400 Acting Chief of Academic Services Division
Mr. Sumrit Srirootthieng ☎ ext. 1610 Chief of Academic Services Section (Rangsit)

Accounting Division
Ms. Areerat Boonboot ☎ ext. 1316 Chief of Accounting Division
Ms. Doungdeaw Asawalertsak ☎ ext. 1316 Chief of Accounting Section (Bangkadi)
Ms. Worawudd Petchtaeh ☎ ext. 1318 Chief of Financial Accounting Section (Rangsit)

Admissions Division
Ms. Wanna Boonkokuae ☎ ext. 1201 Chief of Admissions Division

Central Coordinating Division
Ms. Pornkamon Sriwichainwong ☎ ext. 1208 Chief of Central Coordinating Division
Ms. Boonthiwat Kittiya ☎ ext. 1206 Chief of Personnel Section (Rangsit)
Mr. Manote Narthong ☎ ext. 1209 Chief of Materials and Supplies Section (Rangsit)
Ms. Orapin Kavatham ☎ ext. 1302 General Documentation Coordinator
Ms. Rapeepan Narkruksa ☎ ext. 1305 Chief of Administrative Section (Rangsit)
Computer Center
Asst. Prof. Dr. Komwut Wipusitwarakun ext. 2006 System Manager of Computer Center
Ms. Saowaphan Srisophon ext. 1609 Secretary

Finance Division
Ms. Yowwapa Yodngean ext. 1317 Chief of Finance Division
Ms. Yaowaluk Laothoh ext. 1319 Chief of Finance & Budget Section (Rangsit)

Ground and Properties Division
Mr. Kitipol Sutayasaranakom ext. 1309 Chief of Ground and Properties Division (Rangsit)
Mr. Teerasak Ngogsakda ext. 1308 Chief of Ground and Properties Section (Rangsit)

International Office
Ms. Peetchalika Khattiya ext. 1560 Secretary

Library and Information Services Center
Ms. On-Anong Suraniranat ext. 1503 Head of Library and Information Services Center
Ms. Chotika Praphrutthikul ext. 1508 Chief Librarian
Ms. Mo Mo Tin ext. 1510 Chief Information Scientist

Registration Division
Asst. Prof. Dr. Bunyarit Uyyanonvara ext. 1430 Chief of Registration Division
Mr. Witchapon Jomprapan ext. 1431 Acting Assistant Chief of Registration Division

Student Affairs Division
Ms. Waraporn Thongthua ext. 1403 Chief of Student Affairs Division
Ms. Pavinee Jongjaitate ext. 1402 Acting Chief of Student Affairs Section

Training and Industrial Relation Office
Ms. Janjira Boonruangsaj ext. 1444 Coordinator of Training and Industrial Relation Office

SIIT at Bangkadi
SIIT-Tel: +66 (0) 2501 3505-20; SIIT-Fax: +66 (0) 2501 3524

Director Office
Ms. Prapasiri Kajorncheepunngam ext. 1105 Executive Secretary
Ms. Pattaraporn Boonyingyong ext. 1104 Secretary to Executive Assistant Director at Bangkadi

Academic Services Division
Ms. Naree Moolsawas ext. 1400 Acting Chief of Academic Services Division
Mr. Peerasak Raksanont ext. 1404 Acting Chief of Academic Services Section (Bangkadi)

Computer Center
Asst. Prof. Dr. Komwut Wipusitwarakun ext. 2006 System Manager of Computer Center

Finance Division
Ms. Yowwapa Yodngean ext. 1204 Chief of Finance Division
Ms. Tippharat Pangsoang ext. 1203 Chief of Finance and Budget Section (Bangkadi)

Central Coordinating Division
Ms. Pornkamol Srisuchinwong ext. 1208 Chief of Central Coordinating Division
Ms. Chotip Nuamdee ext. 1202 Chief of Materials and Supplies Section (Bangkadi)
Ms. Sukannika Maitreepan ext. 1201 Chief of Administrative Section (Bangkadi)

Ground and Properties Division
Mr. Seangjan Kwang-Khwang ext. 1300 Chief of Ground and Properties Division (Bangkadi)
Mr. Jedsada Sangnak ext. 1302 Chief of Ground and Properties Section (Bangkadi)
Mr. Kanokchat Choungcham ext. 1305 Chief of Transportation and Gardening Section

Library and Information Services Center
Ms. On-Anong Suraniranat ext. 1503 Head of Library and Information Services Center

Student Affairs Division
Ms. Waraporn Thongthua ext. 1403 Chief of Student Affairs Division
## School Secretaries

### SIIT at Rangsit

SIIT-Tel: +66 (0) 2986 9009, 2564 3221-9; SIIT-Fax: +66 (0) 2986 9112-3

#### School of Bio-Chemical Engineering and Technology (BCET)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ext.</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Monthicha Nimsook</td>
<td>2303</td>
<td>Secretary</td>
</tr>
</tbody>
</table>

#### School of Civil Engineering and Technology (CET)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ext.</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Pattanun Manachitrungrueng</td>
<td>1901</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Pitchayapa Yuenyaw</td>
<td>1902</td>
<td>Secretary</td>
</tr>
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</table>

#### School of Manufacturing Systems and Mechanical Engineering (MSME)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ext.</th>
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</tr>
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<tbody>
<tr>
<td>Ms. Mayuree Phan-on</td>
<td>2203</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Pareena Thaibumrungwiwat</td>
<td>2102</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Wanna Teerapokin</td>
<td>2202</td>
<td>Secretary</td>
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</tbody>
</table>

#### Department of Common and Graduate Studies (CGS)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ext.</th>
<th>Position</th>
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<tbody>
<tr>
<td>Ms. Chanpen Huabnarin</td>
<td>1563</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Sirinart Sirijorn</td>
<td>1561</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Suwanna Punyadee</td>
<td>1518</td>
<td>Secretary</td>
</tr>
</tbody>
</table>

### SIIT at Bangkadi

SIIT-Tel: +66 (0) 2501 3505-20; SIIT-Fax: +66 (0) 2501 3524

#### School of Communications, Instrumentations and Control (CIC)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ext.</th>
<th>Position</th>
</tr>
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<tbody>
<tr>
<td>Ms. Chiranat Puakanokhiran</td>
<td>1802</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Cholthicha Praditkwan</td>
<td>1817</td>
<td>Secretary</td>
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#### School of Information and Computer Technology (ICT)

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Ms. Khotchakorn Puapunthuma</td>
<td>2002</td>
<td>Secretary</td>
</tr>
<tr>
<td>Mr. Passakorn Puangpaiboon</td>
<td>2012</td>
<td>Secretary</td>
</tr>
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</table>

#### School of Management Technology (IMT)

<table>
<thead>
<tr>
<th>Name</th>
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<th>Position</th>
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<tbody>
<tr>
<td>Ms. Benchasri Sryothin</td>
<td>2104</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Prapaiporn Tunyuvardhana</td>
<td>2102</td>
<td>Secretary</td>
</tr>
<tr>
<td>Ms. Usanee Koedlapmeesuk</td>
<td>2110</td>
<td>Secretary</td>
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</table>
School of Bio-Chemical Engineering and Technology
2006 Publications

**International Journals**


**International Conferences**


**Book Chapters**


**School of Bio-Chemical Engineering and Technology**

**Faculty Members, 2006**

1. Dr. Pisanu Toochinda  
   Lecturer
2. Dr. Rapeepong Suwanwarangkul  
   Lecturer (Joined SIIT in October 2006)
3. Dr. Sandhya Babel  
   Associate Professor
4. Dr. Suwanchai Nitisoravut  
   Associate Professor
5. Dr. Thammajun Leungsakul  
   Lecturer (With SIIT during May 2006 – May 2007)

**School of Civil Engineering and Technology**

**2006 Publications**

**International Journals**


**National Journals**


International Conferences


**National Conferences**


**School of Civil Engineering and Technology**

**Faculty Members, 2006**

1. Dr. Amorn Pimanmas Associate Professor
2. Dr. Krishna Murari Neaupane Associate Professor
3. Dr. Mongkut Piantanakulchai Assistant Professor
4. Dr. Prueetha Nanakorn Associate Professor
5. Dr. Somnuk Tangtermsirikul Professor
6. Dr. Taweep Chaisomphob Associate Professor
7. Dr. Winyu Rattanapitikon Associate Professor
School of Communications, Instrumentations and Control

2006 Publications

International Journals


International Conferences


School of Communications, Instrumentations and Control
Faculty Members, 2006

1. Dr. Banlue Srisuchinwong  Associate Professor
2. Dr. Chalie Charoenlarpnopparut  Assistant Professor
3. Dr. Duangrat Eungdamrong  Assistant Professor
4. Dr. Issarachai Ngamroo  Associate Professor (Until 31 October 2006)
5. Dr. Pichai Jintakosonwit  Lecturer (Until 31 October 2006)
6. Dr. Sawasd Tantaratanana  Professor
7. Dr. Suwan Runggeratigul  Associate Professor (Until 31 March 2006)
8. Dr. Toshiaki Kondo  Lecturer
9. Dr. Waree Kongprawechnon  Associate Professor

School of Information and Computer Technology
2006 Publications

**International Journals**


**National Journal**


**International Conferences**


School of Information and Computer Technology
Faculty Members, 2006

1. Dr. Bunyarit Uyyanonvara Assistant Professor
2. Dr. Cholwich Nattee Lecturer
3. Dr. Ekawit Nantajeewarawat Associate Professor
4. Dr. Komwut Wipusitwarakun Assistant Professor
5. Dr. Mud-Armeen Munlin Assistant Professor (Until 31 October 2006)
6. Dr. Pakinee Suwannajan Lecturer
7. Dr. Philippe Meunier Lecturer (Joined SIIT in August 2006)
8. Dr. Stanislav S. Makhanov Associate Professor
9. Dr. Steven Gordon Assistant Professor (Joined SIIT in October 2006)
10. Dr. Thanaruk Theeramunkong Associate Professor
School of Management Technology

2006 Publications

International Journals


International Conferences


**School of Management Technology**  
**Faculty Members, 2006**

1. Dr. Chawalit Jeenanunta  
   Lecturer
2. Dr. Jittima Tongsurai  
   Lecturer (Joined SIIT in June 2006)
3. Dr. Junalux Chalidabhongse  
   Assistant Professor
4. Dr. Piyat Chanvarasuth  
   Lecturer (Joined SIIT in November 2006)
5. Dr. Pornpimol Chongphaisal  
   Lecturer
6. Dr. Somrote Komolavanij  
   Associate Professor
7. Dr. Suebsak Nanthavanij  
   Associate Professor
8. Dr. Veeris Ammarapala  
   Lecturer

**School of Manufacturing Systems and Mechanical Engineering**  
**2006 Publications**

**International Journals**


10. Vimalin Sirikrai and Pisal Yenradee (2006). Modified drum-buffer-rope scheduling mechanism for a non-
identical parallel machine flow shop with processing-time variation, *International Journal of Production 

11. Watcharee Kaewboonsong; Vladimir I. Kuprianov; and Nutsupak Chovichien (2006). Minimizing fuel and 
environmental costs for a variable-load power plant (co-)firing fuel oil and natural gas: part 1. modeling of 
gaseous emissions from boiler units, *Fuel Processing Technology*, Vol. 87, No. 12, December 2006, pp. 1085-
1094.

**International Conferences**

Thai residential sector: long-range energy alternatives planning approach. In *Proceedings of the 2nd Joint 
International Conference on "Sustainable Energy and Environment (SEE 2006)"* [CD-ROM], 21-23 November 

and industrial sectors: long-range energy alternatives planning in the small buildings and industries. In 
*Proceedings of the 2nd Joint International Conference on "Sustainable Energy and Environment (SEE 2006)"

3. Bundit Limmechokchai; Warunees Tia; and Pawinee Sukuntornsiri (2006). Embedded energy and total CO2 
(WREC-IX)*, 19-25 August 2006, Florence, Italy. 6 p.

aggregate production planning problem. In *Proceedings of the 2006 IEEE International Conference on 
Cybernetics & Intelligent Systems and Robotics, Automation & Mechatronics (CIS-RAM 2006)*, 7-9 June 2006, 

5. Busaba Phruksaphanrat; Pisal Yenradee; and Ario Ohsato (2006). Fuzzy aggregate production planning 
model based on theory of constraints. In *Proceedings of the 7th Asia Pacific Industrial Engineering and 
344-356.

*Proceedings of the 7th Asia Pacific Industrial Engineering and Management Systems Conference (APIEMS 

algorithm for care worker scheduling. In *Proceedings of the 7th Asia Pacific Industrial Engineering and 
457-466.

8. Jakapong Pongthanaisawan; Chumnong Sorapipatana; and Bundit Limmechokchai (2006). Land transport 
demand analysis and energy saving potentials in Thailand. In *Proceedings of the 2nd Joint International 
Conference on "Sustainable Energy and Environment (SEE 2006)"* [CD-ROM], 21-23 November 2006, Bangkok, 

approach. In *Proceedings of the Eighth International Conference on Industrial Management (ICIM' 2006)*, 20-

10. Kanit Prasertwattana; Yoshiaki Shimizu; and Navee Chiadamrong (2006). Evoloutional optimization on material 
ordering and inventory control of supply chain through incentive scheme. In *International Symposium on 

combustor fired with rice husk. In *Proceedings of the 2nd Joint International Conference on "Sustainable 

particles emitted from fluidized-bed combustion of Thai rice husk. In *Proceedings of the 2nd Joint International 
Conference on "Sustainable Energy and Environment (SEE 2006)"*, 21-23 November 2006, Bangkok, 


School of Manufacturing Systems and Mechanical Engineering

Faculty Members, 2006

1. Dr. Bundit Limmeechokchai Associate Professor
2. Dr. Chakguay Prakasvudhisarn Assistant Professor (Until May 2007)
3. Dr. Jirachai Buddhakulsomsiri Assistant Professor (Joined SIIT in June 2006)
4. Dr. Lalita Tantimuratha Assistant Professor
5. Dr. Pisal Yenradee Associate Professor
6. Dr. Navee Chiadamrong Associate Professor
7. Dr. Ruengsak Kawtummachai Associate Professor
8. Dr. Satha Aphornratana Associate Professor
9. Dr. Supachart Chungpaibulpattana Associate Professor
10. Dr. Thananchai Leephakpreeda Associate Professor
11. Dr. Vladimir I. Kuprianov Associate Professor
Department of Common and Graduate Studies

2006 Publications

**International Journals**


**International Conferences**


**Department of Common and Graduate Studies**

**Faculty Members, 2006**

1. Dr. Alice Sharp Assistant Professor
2. Dr. Jeffrey Frank Webb Assistant Professor (Joined SIIT in October 2006)
3. Dr. Luckhana Lawtrakul Assistant Professor
4. Dr. Pakorn Opaprakasit Assistant Professor
5. Dr. Ruben Nelson Mera Assistant Professor
6. Dr. Thawatchai Onjun Assistant Professor
<table>
<thead>
<tr>
<th>School</th>
<th>Principal Investigator</th>
<th>Title</th>
<th>Sponsoring Organization</th>
<th>Total Project Budget (Baht)</th>
<th>Duration</th>
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<tbody>
<tr>
<td>BCET</td>
<td>Dr. S. Babel</td>
<td>Removal of Cr(VI) from Contaminated Wastewater by Andisol</td>
<td>Joint Graduate School of Energy &amp; Environment (JGSEE)</td>
<td>328,900</td>
<td>Nov. 2005-May 2007</td>
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<tr>
<td></td>
<td>Dr. A. Sharp</td>
<td>Asia Euro Link Project - Establishment of Master Program at the National University of Laos in Environmental Engineering and Management</td>
<td>European Commission</td>
<td>139,850 (approx. 6,712,800) (SIIT Portion)</td>
<td>Jan. 2006-Dec. 2008</td>
</tr>
<tr>
<td></td>
<td>Dr. S. Babel (with four Universities)</td>
<td>Development of Multi-physics Model for Designing the Solid Oxide Fuel Cell Stack Fueled by Natural Gas and Biomass-Derived Synthesis Gas</td>
<td>The Thailand Research Fund (TRF)</td>
<td>360,000</td>
<td>Dec. 2006-Present</td>
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<tr>
<td></td>
<td>Dr. Rapeepong S.</td>
<td>Design and Development of Methanol Reformer to Produce Hydrogen for Fuel Cell</td>
<td>Thammasat University Research Fund</td>
<td>80,000</td>
<td>May 2007-Present</td>
</tr>
<tr>
<td></td>
<td>Dr. Suwanchai N.</td>
<td>Cultivation and Application of Anammox Organisms for High Nitrogen Wastewater Treatment</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,195,000</td>
<td>Jun. 2005-Present</td>
</tr>
<tr>
<td>CET</td>
<td>Dr. Amorn P.</td>
<td>Preparation of Reinforced Concrete Members Against Seismic Hazard</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,200,000</td>
<td>Jul. 2005-Present</td>
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<td></td>
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<td>The Improvements of Seismic Performance for Reinforced Concrete Bridge</td>
<td>Thammasat University Research Fund</td>
<td>240,000</td>
<td>May 2007-Present</td>
</tr>
<tr>
<td></td>
<td>Dr. Mongkut P. (with AIT)</td>
<td>Logistics Management at the Intermodal Terminals</td>
<td>The Office of the Education Council, The Royal Thai Government</td>
<td>219,000 (SIIT Portion)</td>
<td>Nov. 2005-Present</td>
</tr>
<tr>
<td></td>
<td>Dr. Pruetha N. (with AIT)</td>
<td>Finite Element Modeling of Tsunami Propagation on the Coast of Thailand</td>
<td>The Office of the Education Council, The Royal Thai Government</td>
<td>262,500 (SIIT Portion)</td>
<td>Nov. 2005-Present</td>
</tr>
<tr>
<td></td>
<td>Dr. Somnuk T.</td>
<td>Durability Code of Reinforced Concrete Structures and Performance-based Design Method for Concrete Mix Proportions</td>
<td>Kasetsart University</td>
<td>200,000</td>
<td>Oct. 2006-Present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Development of Expansive Concrete with Expansive Additives for Application in Thailand</td>
<td>Taiheiyo Materials Corporation</td>
<td>635,100</td>
<td>Oct. 2006-Present</td>
</tr>
<tr>
<td></td>
<td>Dr. Tawee C.</td>
<td>Development of Serial Self-turning Reactor System for Composting of Organic Waste</td>
<td>The University of Tokyo</td>
<td>375,442</td>
<td>Nov. 2006-Present</td>
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<tr>
<td></td>
<td>Dr. Winyu R.</td>
<td>Mathematical Modeling for Cross Shore Sediment Transport and Beach Deformation under Irregular Waves</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,120,000</td>
<td>Jul. 2005-Present</td>
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<tr>
<td></td>
<td>Dr. Banlee S.</td>
<td>10.7-MHz Fully-Balanced, High-Q, Wide-Dynamic-Range Current-Tunable Bandpass Filters</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,591,000</td>
<td>Nov. 2006-Present</td>
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<td></td>
<td>Dr. Chalie C.</td>
<td>Two-dimensional Convolutional Code Design: Algebraic Approach</td>
<td>Thammasat University Research Fund</td>
<td>80,000</td>
<td>May 2007-Present</td>
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<td>Design of WCDMA Uplink Adaptive Channel Equalizer</td>
<td>National Electronics and Computer Technology Center (NECTEC)</td>
<td>50,000</td>
<td>Jun. 2006-Present</td>
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<tr>
<td>School</td>
<td>Principal Investigator</td>
<td>Title</td>
<td>Sponsoring Organization</td>
<td>Total Project Budget (Baht)</td>
<td>Duration</td>
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<tr>
<td>CIC</td>
<td>Dr. Issarachai N.</td>
<td>On-Line Monitoring of Wide Area Dynamics between Central and Southern Regions of Thailand Power System via Synchronized Phasor Measurement Units.</td>
<td>The Thailand Research Fund (TRF)</td>
<td>792,000</td>
<td>Sep. 2004-Aug. 2006</td>
</tr>
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<td></td>
<td>Dr. Pichai J.</td>
<td>Implementation and Control of an Anti-Resonance Hybrid Shunt-Capacitor System for Power Factor Correction</td>
<td>National Electronics and Computer Technology Center (NECTEC)</td>
<td>583,080</td>
<td>Nov. 2004-Oct. 2006</td>
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<td></td>
<td>Dr. Sawasd T. Dr. Chalie C. (with 6 Universities)</td>
<td>R &amp; D for 3rd Generation Mobile Telecommunication Systems Phase 2</td>
<td>National Electronics and Computer Technology Center (NECTEC)</td>
<td>39,443,000</td>
<td>Jul. 2004-Present</td>
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<td>ICT</td>
<td>Dr. Bunyarit U.</td>
<td>Information System for Dental PACs</td>
<td>ADTEC and NECTEC</td>
<td>3,664,000</td>
<td>Jun. 2006-Present</td>
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<td></td>
<td>Dr. Thanaruk T. Dr. Ekawit N. Dr. Cholwich N. Dr. Pakinee A.</td>
<td>Research and Development of a Prototype of Medical-related Knowledge Base in Thailand</td>
<td>National Electronics and Computer Technology Center (NECTEC)</td>
<td>2,360,400</td>
<td>Sep. 2006-Aug. 2007</td>
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<td>Assessment of Long-term Energy Demand and Energy Efficiency Improvement in Thailand</td>
<td>Joint Graduate School of Energy &amp; Environment (JGSEE)</td>
<td>60,000</td>
<td>Jun. 2006-Present</td>
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<td></td>
<td>Dr. V. I. Kuprianov</td>
<td>Combustion and Emission Performance of a Swirling Fluidized-bed Reactor Co-firing Biomass Fuels</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,591,000</td>
<td>Jun. 2006-Present</td>
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<td>Comparative Study on Firing Biomass in a Cone-shaped Combustor with Conventional and Swirling Fluidized Beds</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,407,400</td>
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<td>Effects of Operating Conditions on Major and PAH Emissions from a Conical Fluidized-bed Combustor Firing Thai Biomass Fuels</td>
<td>The Thailand Research Fund (TRF)</td>
<td>1,195,000</td>
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<td></td>
<td>Dr. Navee C. Dr. Ruengsak K.</td>
<td>Warehouse and Distribution Management in Sugar Industries</td>
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<td>Apr. 2006-May 2007</td>
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<td>School</td>
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<td></td>
<td>Dr. Pakorn O. Dr. Luckhana L.</td>
<td>The Study of Intra-Molecular Hydrogen Bonds Formation for Improving of Adhesive Strength of Wood Protecting Materials, Phenolic Resins</td>
<td>Thammasat University Research Fund</td>
<td>80,000</td>
<td>May 2007-Present</td>
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<td>CGS</td>
<td>Dr. A. Sharp Dr. S. Babel (with four Universities)</td>
<td>Asia Euro Link Project - Establishment of Master Program at the National University of Laos in Environmental Engineering and Management</td>
<td>European Commission</td>
<td>Euro 139,850 (approx. 6,712,800) (SIIT Portion)</td>
<td>Jan. 2006-Dec. 2008</td>
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<td></td>
<td>Dr. A. Sharp Dr. Thawatchai O.</td>
<td>Study on the Conditions of Using Microorganisms from Wastewater Treatment Facility to Produce Electricity</td>
<td>Thammasat University Research Fund</td>
<td>80,000</td>
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<td>Dr. Thawatchai O. Dr. Luckhana L.</td>
<td>Predictions of Nuclear Fusion Energy Efficiency in ITER Tokamak</td>
<td>Thammasat University Research Fund</td>
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<td>May 2007-Present</td>
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SIIT Doctoral Faculty Members’ 2006 Publications

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<th>Publications (1)</th>
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<td>International Journal Papers</td>
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<td>Regional/National Journal Papers</td>
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<td><strong>No. of Equivalent International Journal Papers /Faculty Member</strong></td>
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(1) Publications with non-SIIT co-authors are weighted according to the number of SIIT authors
(2) Equivalent Number: International Journal Paper in International Database x 1.0, International Journal Paper x 0.75, National Journal Paper x 0.5, International Conference Paper x 0.33
(3) 27.38 International Journal Papers in International Databases (x 1.0) and 6.78 International Journal Papers (x 0.75)

SIIT Graduate Students, 2nd/2006 Semester

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<th>Program</th>
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<td>Electrical Engineering</td>
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<td>Mechanical Engineering</td>
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<td>Telecommunications</td>
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<td>Environmental Technology</td>
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<td>Management Technology</td>
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## Royal Golden Jubilee & ADB Scholarships for Graduate Students

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<th>Scholarships</th>
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## External Research Grants and Internal Research Support

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<th>School/Department</th>
<th>External Research Grants, Baht</th>
<th>Internal Research Support*, Baht</th>
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<td>Academic Year (June - May)</td>
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<td><strong>School/Department</strong></td>
<td>2004</td>
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<tr>
<td>School of Bio-Chemical Engineering and Technology</td>
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<td>School of Civil Engineering and Technology</td>
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<td>School of Communications, Instrumentations and Control</td>
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<td>School of Information and Computer Technology</td>
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<td>10,717,386</td>
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* Internal research support includes financial support for graduate thesis, for paper presentation and publication.
Access to SIIT at Bangkadi

SIIT, Bangkadi Industrial Park
Tivanond Road, T. Bangkadi, A. Mueang, Pathum Thani 12000, Thailand

Donmuang Airport to Bangkadi Industrial Park

Sirindhorn International Institute of Technology (SIIT) at Bangkadi
Thammasat University
131 Moo 5, Tivanond Road, Bangkadi, A. Mueang, Pathum Thani 12000, Thailand
Tel. +66 (0) 2501 3505-20. Fax. +66 (0) 2501 3524
http://www.siit.tu.ac.th
Access to SIIT at Rangsit

SIIT, Thammasat University, Rangsit Campus
Km. 41 on Paholyothin Highway, Klong Luang,
Pathum Thani 12121, Thailand

Donmuang Airport to TU-Rangsit Campus

Sirindhorn International Institute of Technology (SIIT) at Rangsit
Thammasat University
P.O. Box 22, Thammasat-Rangsit Post Office, Pathum Thani 12121, Thailand
Tel. +66 (0) 2986 9009, (0) 2564 3226. Fax. +66 (0) 2986 9112-3
http://www.siit.tu.ac.th
Sirindhorn International Institute of Technology
Thammasat University
http://www.siit.tu.ac.th