The TIGP Program on “Social Networks and Human-Centered Computing”

The TIGP on Social Networks and Human-Centered Computing (SNHCC) is a new program established jointly by National Tsing Hua University (NTHU), National Chengchi University (NCCU), and Academia Sinica. Social Networks and Human-Centered Computing are new important areas focusing on the interplay of multimedia contents and social networks. Research issues include user reasoning, user interest profiling, social multimedia, setting-based content pooling, emotional impact analysis/prediction, image/video ranking, transformation, and application development with crowdsourcing.

Natural Language Processing and Information Retrieval in Social Networks:
- This area focuses on various designs of models, methods, algorithms for document representation, click modeling, social tagging, blog search, microblog and forum searching, community-based question answering, intent predictions, query suggestions, vertical searches, local searches, dynamic web searches, security and privacy issues of web searches, real-time content searches, computational advertising, cognitive modeling, psycholinguistics, opinion mining, and summarization in social media.

Data Mining in Social Networks:
- This area focuses on the design of algorithms for social media analysis, blogs and friendship network analysis, email and messaging analytics, influence spreading and viral marketing, social reputation and trust, user profiling and recommendation systems, social media searches, expertise and authority discovery, community identification, link prediction, collaborative data analysis, and data mining with social factors.

Social Multimedia:
- This area focuses on the interplay of multimedia contents and social networks. Research issues include user reasoning, user interest profiling, social setting-based content pooling, emotional impact analysis/prediction, image/video ranking, transformation, and application development with emotion models, aesthetic quality assessment, improved efficiency for data/metadata collection, and multimedia ground truth construction with crowdsourcing.

Mobile Social Networks:
- This area focuses on networking challenges for cloud, mobile, and P2P social networks. Research issues include social reputation and privacy in P2P networks, dissemination of social advertisements in location-based social networks, measurement and analysis of social traffics and dynamics, analysis of mobile user behavior, together with energy, bandwidth, and time efficient strategies for mobile social networks.
Human-Centered Computing:
• This area focuses on the principles, designs, implementations, and experiments of systems, and mechanisms that rely on programmatic access to human intellect to perform some aspect of computation, or where human perception, knowledge, reasoning, or physical activity and coordination contributes to the computation of infrastructures, systems, applications, and/or services on social media, social networking, user-generated content, wikis, blogs, online gaming, crowdsourcing, collective intelligence, virtual worlds, and collaborative information seeking.

Advance to Candidacy
• Students have to complete at least 18 credit units, and pass the Ph.D. Qualifying Examination.
• Students have to choose one of the five topics listed above in the Research Topics section as their area of concentration within the first year after enrollment.
• In the first four semesters, students have to complete 6 courses including 3 out of the 5 core courses (“Natural Language Processing and Information Retrieval with Applications in Social Networks”, “Data Mining in Social Networks”, “Social Multimedia”, “Mobile Social Networks”, and “Human-Centered Computing”), “Project Research” to work on research related to their thesis, and at least 3 of the elective courses. Also, students have to participate in “Seminars” for the first 6 semesters. According to students’ backgrounds, degree requirements may include participation of prescribed planned curriculum. All courses are taught in English.
• The qualifying exam is based on the five core courses and consists of five subjects. The examination is held twice every year in early Sep and late Feb. Students can choose which subjects to take on every examination. The result of the examination for each subject taken is either pass or fail. A subject can be taken twice at most. Students have to pass at least three subjects within 5 semesters after enrollment. Students who enroll in NTHU will need to pass one more subject. More details can be found on the website.

Degree Requirements
• Complete at least 3 out of 5 core courses and the prescribed credit hours.
• The grade of every course should reach at least 70 points (or B- in letter grade).
• Obtain Ph.D. Candidacy.
• Pass the dissertation proposal.
• Publish at least one paper in a top journal or two papers in top conferences, which will be examined and verified by the TIGP Educational Administration Committee. Students have to be the primary author (or corresponding author) of the paper. The paper needs to be published, or a proof of the acceptance should be submitted.
• Pass the oral defense. Notice that a student must pass the examination of graduation by TIGP Educational Administration Committee before proposing the oral defense. The oral defense committee should include at least five members in related research fields. Among them, at least one third of the members should come from organizations other than NTHU, NCCU, and Academia Sinica.
• The length of study is at most seven years.

Admission to the Ph.D. Program
• Master’s degree in computer science or other related areas, or equivalent qualification based on the regulation of the Ministry of Education of Taiwan.
• Fluency in English:
  a. TOEFL: A total score of 550 on paper-based, 213 on computer-based, 79 on internet-based (TOEFL-iBT) or higher.
  b. IELTS: A minimum overall Band Score of 5.5 or higher.
  c. GEPT: Applicants in Taiwan can take the General English Proficiency Test (GEPT) administered by the Language Training and Testing Center. Applicants are required to submit their High-intermediate level certificate when applying for admission. This requirement can be waived for those who have obtained bachelor or master degrees from native English-speaking countries.

For example, applicants with degrees from: Australia, Canada (except Quebec), New Zealand, Singapore, United Kingdom (England, Scotland, Ireland, Wales) will automatically receive an English language waiver.
• GRE score from the general exam. An applicant may submit one of the following materials in place of a GRE general test score:
  1. Any evidence of research ability such as papers published in international conferences or journals.
  2. Satisfactory performance in any course or project work related to the areas of this program.
• (Required) Advanced programming skills demonstrated by courses or projects completed.
• A Statement of Purpose that includes a research plan.
• Official transcripts from academic institutions attended after senior high school.
• Three letters of recommendation.
• GRE score from related subject exam (highly recommended, but not mandatory).
• Concerning the standardized exams listed above (TOEFL; GRE general, GRE subject), our institution CODE is 7142 and NAME is Academia Sinica.

After reviewing all the supporting documents mentioned above, candidates passing the first screening might be invited for an interview. Local candidates will be asked to come to Academia Sinica for interviews. For international students, interview via skype will be conducted.

The deadline for all applications will be on March 31 every year. If you wish to apply, please complete your application though online application system (http://db1x.sinica.edu.tw/tigp/) or post your application with required documents listed above to the following address:

TIGP Admission Office
Taiwan International Graduate Program
128 Academia Road, Section 2
Nankang, Taipei 115
Taiwan, R.O.C.

The submitted application materials will not be returned to applicants under any circumstances. The complete application materials should be received by TIGP before March 31.

Faculty and Staff

National Tsing Hua University

Chung-Ta King
Ph.D., Michigan State University, USA
Pervasive computing, cluster computing, parallel and distributed systems

Von-Wun Soo
Ph.D., Rutgers University, USA
Intelligent agent, machine learning, Bioinformatics

Jason S. Chang
Ph.D., New York University, USA
Natural language processing, knowledge management, IR, MT, AI

Hwann-Tzong Chen
Ph.D., National Taiwan University, Taiwan
Computer vision, pattern recognition

Cheng-Hsin Hsu
Ph.D., Simon Fraser University, Canada
Multimedia networking, mobile multimedia, networked games, peer-to-peer networks

 Yi-Shin Chen
Ph.D., University of Southern California, USA
Web intelligence, multimedia retrieval, Meta-search, realtime queries for continues data streams

Hao-Chuan Wang
Ph.D., Cornell University, USA
Human-computer interaction, social computing, language technologies, educational technology
Chia-Wen Lin  
Ph.D., Tsing Hua University, Taiwan  
Multimedia networks, visual communication, image/signal processing

Fu-Ren Lin  
Ph.D., University of Illinois at Urbana-Champaign, USA  
Multimedia systems and computer networks, mobile multimedia, video dissemination over hybrid networks, cloud multiplayer games, and efficient content sharing in mobile social networks

Jyun-Cheng Wang  
Ph.D., University of Wisconsin-Madison, USA  
Social network, community & EC, patent analysis

Shelly Shwu-Ching Young  
Ph.D., Ohio State University, USA  
Cryptography, network security, watermarking, image compression

National Chengchi University

Yau-Hwang Kuo  
Ph.D., National Cheng Kung University, Taiwan  
Mobile communications, cloud computing and security, social media, big data analytics, context-aware computing

Arbee L.P. Chen  
Ph.D., University of Southern California, USA  
Cloud databases, big data analytics, Top-k queries, data stream processing and analysis, data mining, multimedia information systems

Kung Chen  
Ph.D., Yale University, USA  
Programming languages, software systems, data-driven application development

Yuh-Jong Hu  
Ph.D., University of Missouri at Rolla, USA  
Semantic web, privacy-preserving big data analysis, privacy-aware social web, data protection in the cloud, information and law

Yao-Nan Lien  
Ph.D., Purdue University, USA  
Mobile computing, computer and communication networks, database systems, and telecommunication policy

Tsai-Yen Li  
Ph.D., Stanford University, USA  
Robotics, computer animation, artificial intelligence, intelligent user interface, interactive storytelling, user behavior modeling, social media analysis

Chao-Lin Liu  
Ph.D., University of Michigan, USA  
Automatic reasoning, natural language processing and information retrieval, computational linguistics, digital humanities, intelligent tutoring system, intelligent transportation systems

Jyi-Shane Liu  
Ph.D., Carnegie Mellon University, USA  
Social network analysis and mining, social informatics, digital humanities, digital library

Man-Kwan Shan  
Ph.D., National Chiao Tung University, Taiwan  
Big data, data mining, multimedia systems, social networks, computer music, cloud databases, digital humanities

Hung-Chin Jang  
Ph.D., University of Illinois at Chicago, USA  
Wireless communications, mobile network management, mobile communication systems, green network communication, Machine to Machine (M2M), IOS / Android APP development

Cheng-Chia Chen  
Ph.D., National Taiwan University, Taiwan  
Software language engineering, logic in computer science, theory of computation,

Tzu-Chieh Tsai  
Ph.D., University of California, USA  
Wireless computer networks, QoS management, mobile internet, computer simulation environment design

Wen-Hung Liao  
Ph.D., University of Texas at Austin, USA  
Computer vision, pattern recognition, human-computer interaction

Raylin Tso  
Ph.D., University of Tsukuba, Japan  
Cryptography, network security, information security

Ming-Te Chi  
Ph.D., National Cheng Kung University, Taiwan  
Non-photorealistic rendering, stylistic rendering, applied perception in graphics and visualisation, point rendering

Pei-Jeng Kuo  
Ph.D., University of Tokyo, Japan  
Multimedia retrieval and analysis, digital content technology, digital archive

Kuo-Wei Hsu  
Ph.D., University of Minnesota at Twin Cities, USA  
Data management and analysis

Ming-Feng Tsai  
Ph.D., National Taiwan University, Taiwan  
Information retrieval, machine learning, web search and mining, social network analysis, natural language processing

Neng-Hao Yu  
Ph.D., National Taiwan University, Taiwan  
Interactive tabletop, tangible and multi-touch interactions, mobile and cloud computing

Chun-Feng Liao  
Ph.D., National Taiwan University, Taiwan  
Smart Environment (Pervasive Computing), service-oriented systems, cloud computing, linked open data, healthcare systems

Academia Sinica

Institute of Information Science

Wen-Lian Hsu  
Ph.D., Cornell University, USA  
Algorithms, computational molecular biology, intelligent agents, knowledge management, natural language processing

Hsin-Min Wang  
Ph.D., National Taiwan University, Taiwan  
Spoken language processing, natural language processing, multimedia information retrieval, pattern recognition

Wen-Tsuen Chen  
Ph.D., University of California, USA  
Intelligent sensing and applications, mobile computing, high-speed communications networks, parallel algorithms and systems, software engineering

Hong-Yuan Mark Liao  
Ph.D., Northwestern University, USA  
Content-based multimedia retrieval, video-based human behavior analysis, multimedia protection, 3D mesh decomposition and recognition, multimedia signal processing

Wen-Liang Hwang  
Ph.D., New York University, USA  
Wavelet analysis, signal, image and video processing

Jan-Ming Ho  
Ph.D., Northwestern University, USA  
Information retrieval and knowledge management, combinatorial optimization, digital library and archive technology, multimedia network protocol and applications, Bioinformatics

Tyng-Luh Liu  
Ph.D., New York University, USA  
Computer vision, pattern recognition, machine learning

Da-Wei Wang  
Ph.D., Yale University, USA  
Privacy enhancing technology, graph theory and algorithms, medical informatics

National Taiwan University

*Note: The list is not exhaustive and represents a selection of professionals with expertise in various fields.*
Keh-Jiann Chen  
Ph.D., State University of New York, USA  
Chinese language processing, lexical semantics, lexical knowledge representation

Tsan-Sheng Hsu  
Ph.D., University of Texas at Austin, USA  
Design, analysis, implementation and performance evaluation of computer algorithms, graph theory and its applications, data-intensive computing, data privacy, theory of computer games

Ming-Chang Chen  
Ph.D., University of California, USA  
QoS networking, wireless networks, operating systems, data, text and knowledge management, information retrieval

Chu-Song Chen  
Ph.D., National Taiwan University, Taiwan  
Pattern recognition, computer vision image processing

Chi-Jen Lu  
Ph.D., University of Massachusetts, USA  
Machine learning, computational complexity, algorithms, game theory

Chun-Shien Lu  
Ph.D., National Cheng-Kung University, Taiwan  
Compressed sensing, sparse signal processing, security and privacy in multimedia and sensor networks

Chien-Min Wang  
Ph.D., National Taiwan University, Taiwan  
Cloud computing, parallel and distributed computing, distributed file systems, virtualization technology, dynamic binary translation

Ling-Jyh Chen  
Ph.D., University of California, USA  
Mobile and wireless networks, network measurements, networked sensing, human computation

Sheng-Wei Chen (Kuan-Ta Chen)  
Ph.D., National Taiwan University, Taiwan  
Quality of experience, multimedia systems, social computing, crowdsourcing and human computation

De-Nian Yang  
Ph.D., National Taiwan University, Taiwan  
Social networks and mobile data management, mobile multimedia networks and applications

Mi-Yen Yeh  
Ph.D., National Taiwan University, Taiwan  
Data mining, databases

Yuan-Hao Chang  
Ph.D., National Taiwan University, Taiwan  
Next-generation storage systems and their applications, real-time embedded systems and their OS designs, multi-core architecture and virtualization technology

Lun-Wei Ku  
Ph.D., National Taiwan University, Taiwan  
Natural language processing, computational linguistics, sentiment (opinion and emotion) analysis, information extraction and retrieval, Chinese language processing, topic detection and tracking

Keh-Yih Su  
Ph.D., University of Washington, Seattle, USA  
Statistical semantic machine translation, machine reading, statistical language modeling, natural language processing, natural language understanding, machine learning

Research Center for Information Technology Innovation

Ming-Syan Chen  
Ph.D., University of Michigan, USA  
Data mining, query processing, databases, multimedia networking, mobile computing

Tei-Wei Kuo  
Ph.D., University of Texas at Austin, USA  
Real-time systems, embedded systems, flash memory storage systems, PCM, real-time operating systems, real-time database systems

Yu-Chiang Frank Wang  
Ph.D., Carnegie Mellon University, USA  
Pattern recognition, machine learning, computer vision, multimedia signal processing, information retrieval

Pi-Cheng Hsiu  
Ph.D., National Taiwan University, Taiwan  
Networked embedded systems, real-time systems, wireless mobile networks

Ching-Ju Lin  
Ph.D., National Taiwan University, Taiwan  
Wireless system design, multimedia networking, peer-to-peer computing, social computing, ubiquitous computing

Wei-Ho Chung  
Ph.D., University of California, Los Angeles, USA  
Communications, signal processing, networks, and multimedia

Wen-Huang Cheng  
Ph.D., National Taiwan University, Taiwan  
Multimedia content analysis, computer vision, mobile multimedia applications, human computer interaction

Chia-Han Lee  
Ph.D., Princeton University, USA  
Wireless communications, wireless networks, image processing, stochastic geometry, complex systems

Yen-Yu Lin  
Ph.D., National Taiwan University, Taiwan  
Computer vision, pattern recognition, machine learning, multimedia systems

Yi-Hsuan Yang  
Ph.D., National Taiwan University, Taiwan  
Music information retrieval, analysis, and visualization, machine learning, multimedia systems, smart phone and cloud-based applications, lyrics analysis

Yu Tsao  
Ph.D., Georgia Institute of Technology, USA  
Speech and audio processing, pattern recognition and machine learning, human language processing, multimedia signal and information processing

Ronald Y Chang  
Ph.D., University of Southern California, USA  
Wireless communications and networking, signal processing applications

Cheng-Te Li  
Ph.D., National Taiwan University, Taiwan  
Social networks, data mining, social media analytics, urban computing

Chih-Yu Wang  
Ph.D., National Taiwan University, Taiwan  
Game theory, wireless communication, social network

**Course**

Students need to complete 3 of the Score courses and at least 3 elective courses. Since NTHU and NCCU honor the course credits granted by each other, students in this program can take related courses in English from both schools.

**Core courses**
- Natural Language Processing and Information Retrieval with Applications in Social Networks (3 credits)
- Data Mining in Social Networks (3 credits)
- Social Multimedia (3 credits)
Elective courses
- Search Engine (3 credits)
- Special Topics on Information Extraction (3 credits)
- Special Topic on Machine Translation (3 credits)
- Machine Learning (3 credits)
- Information Retrieval (3 credits)
- Natural Language Processing (3 credits)
- Multimedia Information Retrieval (3 credits)
- Semantic Web and Web Services (3 credits)
- Special Topics on Natural Language Processing, Information Retrieval, and Data Mining in Social Networks (3 credits)
- Data Mining: Concepts, Techniques, and Applications (3 credits)
- Social Computing (3 credits)
- Advanced Database Systems (3 credits)
- Social Cloud Computing (3 credits)
- Social Network and Applications (3 credits)
- Multimedia Communication (3 credits)
- Introduction to Multimedia Coding (3 credits)
- Graph Drawing (3 credits)
- Image Processing (3 credits)
- Advanced Image Processing (3 credits)
- Algorithms for Image Analysis (3 credits)
- Computer Graphics (3 credits)
- Computer Vision (3 credits)
- Pattern Recognition (3 credits)
- Advanced Computer Graphics (3 credits)
- Special Topics on Social Multimedia (3 credits)
- High-Speed Networks (3 credits)
- Optical Fiber Communication Systems (3 credits)
- Broadband Mobile Communications (3 credits)
- Special Topics in Mobile Computing (3 credits)
- Mobile Telecommunications Networks (3 credits)
- Wireless Communications (3 credits)
- Wireless Communication Networks (3 credits)
- Wireless Communications Special Topic (3 credits)
- Wireless Communication Systems (3 credits)
- Wireless Sensor Networks Protocols and Applications (3 credits)
- Wireless Network (3 credits)
- Wireless Transmission and Networks Technologies and Their Patent Issues (3 credits)
- Cloud Computing (3 credits)
- Cloud-based Software Service Lab (3 credits)
- Cloud Computing Platform for 4C Electronic Applications (3 credits)
- Cloud Programming (3 credits)
- Network Computing (3 credits)
- Multimedia Networking and Systems (3 credits)
- Network Computing (3 credits)
- Graph Theory (3 credits)
- Communication Theory (3 credits)
- Network Science (3 credits)
- Network Management (3 credits)
- Stochastic Processes for Networking (3 credits)
- Error-Correcting Codes (3 credits)
- Error-Correcting Codes (II) (3 credits)
- Computer Networks (3 credits)
- Queuing Theory (3 credits)
- Advanced Mobile Computing (3 credits)
- Telecommunication Networks (3 credits)
- Mobile Network Management (3 credits)
- Internet Security (3 credits)
- Selected Topics in Information Security and Cryptography (3 credits)
- Multimedia Network (3 credits)
- The Third Generation Mobile Communication Network (3 credits)
- Special Topics on Mobile Social Networks and Human-Centered Computing (3 credits)
- Introduction to Human Computer Interaction (3 credits)
- Human-Computer Interaction with Touch-Based Interfaces (3 credits)
- Big Data for Science (3 credits)
- Social Media and Network Analysis (3 credits)
- Indigenous Psychology (3 credits)
- Contemporary Topics in Social Psychology (3 credits)
- Research Seminar in Social Psychology (3 credits)
- Social Cognition (3 credits)
- Intergroup Relationship (3 credits)
- Sociophysics (3 credits)
- Information Seeking in Communication Contexts (3 credits)
- Seminar on Information Planning and Synthesis (3 credits)
- 3D Virtual World Building (3 credits)
- Digital Narratives: Using Digital Storytelling as Research Methods (3 credits)
- Digital Design and Presentation (3 credits)
- New Media Research (3 credits)
- Social Network Analysis (3 credits)
- Operations Research (3 credits)
- Multivariate Analysis (3 credits)
- Numerical Analysis (3 credits)
- Special Topics in Human Factor Engineering (3 credits)
- Human Information Processing (3 credits)
- Man-Machine System Design (3 credits)
- Introduction to Service Science (3 credits)
- Text Mining (3 credits)
- Social Network Analysis and Management (3 credits)
- Introduction to Service-Oriented Architecture (3 credits)
- Mobile Cloud Service System Design and Implementation (3 credits)
- Theory of Learning Sciences (3 credits)

TA and Chinese Language

TA experience is an essential part of our program. Thus, all students from TIGP must serve as TA for at least one semester. Additionally, in order to help their daily lives and communication with the local people, international students are required to take a one-year course in Mandarin Chinese.

Academic System

The TIGP on Social Networks and Human-Centered Computing cuts into social networks and human-centered computing mainly from the viewpoint of computer science and engineering, and is supplemented by social and behavioral science, to provide students in the program with interdisciplinary training. This program adopts a team-teaching system, and students should decide their advisors in...
the first academic year after enrollment. This program is completely taught in English. The courses include core courses, elective courses, seminar and project research. Program professors guide students to the newest research topics in the field of social network and human-centered computing to conduct high-quality, cutting-edge research.

**Student Status and Degree Conferral Policy**

The admission to this program is limited to 20 students per year. In addition to international students with proficient English ability, Taiwanese students with solid English abilities can enroll after passing one of the English proficiency tests listed above. Students can choose to enroll in NTHU or NCCU. This program gives priority to computer science and takes social and behavioral science as subsidiaries to provide students with training across different disciplines.

**Cost of Study**

The payment of tuition fees (basic fees + credit fees are about US$1,000 per semester) for all students should be made by the deadline.

**Fellowship and Stipends**

The TIGP will provide fellowship support for all graduate students during the first year of their enrollment at about NT$34,000 (about US$1,133) per month. The support will be extended for another two years upon evidence of satisfactory progress towards the degree. In subsequent years, the financial support will be provided by the student’s thesis advisor. The amount of the support will be at the discretion of the advisor.

**Medical Insurance**

Six months after they receive their Alien Resident Certificate, the students will qualify for Taiwan’s National Health Insurance Program. The students pay the same premium (about US$210 per year) as all the Taiwanese citizens and will be entitled to the same medical coverage.

**Living and Housing Costs**

On campus self-catering student dormitory is available to TIGP students at reasonable costs (for details please visit our website at http://tigp.sinica.edu.tw/housing.html). Off-campus private housing is generally more expensive. Rents for off-campus apartments range from NT$5,000-15,000 per month. Meals are available on campus at the Activity Center Cafeteria, the Café, the Chinese restaurant, and the Western restaurant at modest costs. Various types of local cuisines are also available at off-campus cafeterias and restaurants within walking distance and at affordable prices.

**Correspondence and Information**

For general information concerning TIGP, please contact:
Ms. Huan-Yi Shen
Administrative Assistant
Taiwan International Graduate Program

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For information concerning this Program, please contact:
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**Websites Information**

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Academia Sinica
http://www.sinica.edu.tw

National Tsing Hua University
http://www.nthu.edu.tw

National Chengchi University
http://www.nccu.edu.tw

If there is any discrepancy on this pamphlet with the most updated regulation, the latter is to be followed.

This program is sponsored by
Institute of Information Science &
Research Center for Information Technology Innovation,
Academia Sinica

in cooperation with
Institute of Information Systems and Applications,
National Tsing Hua University

&
College of Science,
National Chengchi University