

5. International Cooperation Activities

Members of CIET have numerous joint cooperative works with the related institutes around the world. Typical international cooperation activity examples are summarized in the following.

5.1 Subproject 1 (SP1)

- International exchange: The microwave group has actively participated in international cooperation, including a joint research in MMIC with iHP in Germany, exchange and collaboration with Ghent University in Belgium, a yearly technology conference jointly held by NTU and KAIST on advanced packaging, and a joint proposal with Montreal Ecole Polytech, etc. Based on such foundation, the subproject will strengthen the international exchange and collaboration, thereby exploring shared synergy for the promotion of technology advancement in microwave and mmW technologies in the world.
- The microwave team of our center has a long-term collaborative relationship and has involved in important astronomy radio telescope projects, such as AMiBA, and ALMA, etc. We have developed mmW components for the receivers which have been used in the existing telescope systems, for example, the AMiBA located in Hilo, Hawaii.
- International Conference: The microwave group has organized or co-organized several international conferences in last five years, including EDAP in 2007, EMF Workshops in 2007 and 2008, EMC Workshop in 2008, NTU-KAIST Workshops in 2009 and 2010, and IEEE R10 Distinguished Lectures Workshop in 2011. Highly involved in the IEEE Distinguished Lectures programs, 18 seminars of distinguished speakers have been arranged in these five years, including many world leaders, e.g., Profs. Tatsuo Itoh, Richard Snyder, Magdalena, Weng-Cho Chew, Alexopoulos, etc. The group has constantly participated in the university exhibition in IMS and APMC, consequently highly visible in the world. Furthermore, it has also been approved to organized two major international conferences in the coming years, including IEEE Electrical Design of Advanced Packaging and Systems in Dec. 2012 and URSI Asia Pacific Radio Science Conference in Sept. 2013.

5.2 Subproject 2 (SP2)

- The research group led by Professor Hsin-Hsi Chen collaborated with Professor Noriko Kando (National Institute of Informatics, Japan), Dr David Kirk Evans (Amazon Japan), Professor Yohei Seki (Toyohashi University of Technology, Japan), and Dr Le Sun (ISCAS, Chinese Academy of Science, China) to develop multilingual opinion analysis test beds, and released them in NTCIR-7 (June 2007-December 2008) and NTCIR-8 (May 2009-June 2010) MOAT evaluation. These test beds provide Chinese, English and Japanese materials which facilitate the evaluation of opinion detection, polarity judgment, holder/target identification, and relevance judgment.
- Prof. Bing-Yu Chen was invited to serve as a visiting researcher by The University of

Tokyo since 2008, and hence collaborated some projects with students and faculties of The University of Tokyo. In the past three years, he and his collaborators at The University of Tokyo published two papers in ACM Transactions on Graphics (presented in ACM SIGGRAPH Asia), three papers in Computer Graphics Forum (presented in Pacific Graphics), and several international journal and conference papers. Besides these published papers, he still has several ongoing projects with the researchers in Japan.

- The research group lead by Prof. Chih-Jen Lin has collaborated with Michael Ringgaard at Google Research to develop fast machine learning methods for language parsing. A provisional patent was filed in August 2009 and a paper appeared in Journal of Machine Learning Research 2010.
- Prof. Ming Ouhyoung has collaborated with a USC team led by Prof. Paul Debevec on facial expression 3D model acquisition. The results have been published in SIGGRAPH Asia 2008. In 2010, Prof. Ming collaborated with Prof. Brian Barsky at University of California, Berkeley. Prof. Barsky is an expert on photography and optics, and he is also the fellow of of American Optometry Society and the reviewer of international photography competition. Two papers are published :
 - Che-Hua Yeh, Wai-Seng Ng, Brian A. Barsky, Ming Ouhyoung, “An Esthetics Rule Based Ranking System for Amateur Photos”, Sketches, ACM SIGGRAPH Asia 2009, December, Japan, 2009.
 - Che-Hua Yeh, Yuan-chen Ho, Brian A. Barsky, Ming Ouhyoung, “Personalized Photo Ranking and Selection System”, (full paper), pp. pp. 211-220, Proc. ACM Multimedia 2010, Italy
- Prof. Winston Hsu conducted tangible collaborations in large-scale social medial analysis and retrieval with Dr. Jiebo Luo (Eastman Kodak Research), Dr. Tao Mei (Microsoft Research Asia), and Dr. Rong Yan (Facebook). The research results had been highly visible as publications in important conferences and journals. We, as guest editors, also successfully organized a special issue, titled "Knowledge Discovery from Community-Contributed Multimedia," in IEEE Multimedia Magazine, July-December 2010.

5.3 Subproject 3 (SP3)

- Prof. Sao-Jie Chen of subproject 3 conducted the research on “Development of a Hierarchical Network-on-Chip System Platform Synthesizer” cooperated with University of Wisconsin, Madison from 8/1/2008 to 7/31/2011 and the REALIFE-CR project (a REasoning and Learning with Intelligent FPGA Embedded CR Platform) from 11/1/2008 to 10/31/2009.
- The hardware design team collaborated with Columbia University and University of California, San Diego for scholar exchange and research.
- Members of subproject 3 worked on a project which consolidates the efforts from reputable research teams in France, Korea, Thailand, Taiwan and the Philippines in order

to extend the benefits of individual experience to a broader set of knowledge inside a French Asian research network for 3G beyond services and architectures. The collaboration focuses on bringing advanced service architecture and applications in a 3G beyond environment. Novel paradigms will be proposed for the delivery of user-centric customized communication services. The effectiveness of the mechanisms will be demonstrated with a prototype. The duration of this project is from April 2008 to December 31st 2010.

- Prof. Ai-Chun Pang of subproject 3 executed a project called Woaa! Wireless Broadband Overlay Network Architectures and Application, French Ministry of Foreign Affairs, 1/2008—12/2009.
- This project consolidates the efforts from reputable research teams in France, Korea, Thailand, Taiwan and the Philippines in order to extend the benefits of individual experience to a broader set of knowledge inside a French Asian research network for 3G beyond services and architectures. The collaboration focuses on bringing advanced service architecture and applications in a 3G beyond environment. Novel paradigms will be proposed for the delivery of user-centric customized communication services. The effectiveness of the mechanisms will be demonstrated with a prototype.

5.4 Subproject 4 (SP4)

- The members of this team continuously cooperate with international research teams with world leading achievements in communication technologies (e.g., TU Dresden in Germany, AAU in Denmark, etc.).
- We have cooperated with Philips Research North America on feature detection of DVB-T signals using autocorrelation of cyclic prefix (CP) of OFDM signal.
- Cooperation with Prof. Adrian Perrig at CMU on high speed cryptography for mobile devices. Due to the fast progress of cloud computing, mobile devices and thin clients are used more frequently than ever before. However, to provide such lightweight device with ample security and authentication capabilities, we need tailored lightweight and high speed cryptographic algorithms. In the collaboration with Prof. Adrian Perrig, we address these issues.
- We are going to host PQCRYPTO 2011 in Taipei, Taiwan. This is the most prestigious international conference in post-quantum cryptography, and PQCRYPTO 2011 is the first time that this conference is held in Asia. Our faculty member Prof. Chen-Mou Cheng will serve as the General Chair of PQCRYPTO 2011.
- Hsu-Chun Yen has been collaborating with Prof. Jacques Sakarovitch of Ecole nationale supérieure des télécommunications (ENST), and Prof. Sylvain Lombardy of Université Paris-Est Marne-la-Vallée, Paris, France, on weighted automata, and with Prof. Shigeo Takahashi of University of Tokyo on 3D unfolding and map labeling.
- In these years, we ever cooperated with UNSW and APuHC to research Mental Health Suicide Prevention and cooperated with Prof. Demiris of University of Washington music and theater performance to hold the 2010 International Symposium of Music and

Health Promotion.

- We cooperated with the French IPAL and other six lab to jointly participate in Taiwan National Science Council- French National Research Agency(NSC-NRA) to research COgnitive MIcroscope.

5.5 Subproject 5 (SP5)

- We are cooperating with University Ghent, Belgium to produce ultra-low-loss Si waveguides. The research group is led by Professor Roel Baets. He has made contributions to the design and fabrication of III – V semiconductor laser diodes, passive guided-wave devices, photonic integrated circuits, and microoptic components.
- We are collaborating with Fudan University and Nanjing University to employ the Si-rich SiO_x/SiN_x/SiC_x films with buried Si nanocrystals to fabricate light emitting/amplification and solar-energy transferring devices with their corresponding gain/loss and quantum efficiency being characterized.
- We are collaborating with Prof. Tsing-Hua Her and Prof. Lee W. Casperson, Center for Optoelectronics and Optical Communications, University of North Carolina at Charlotte, USA, on modeling of photonic-crystal fibers and novel photonic devices. Recent joint work includes numerical modeling of gain saturation and output characteristics of index-antiguided planar waveguide amplifiers with homogeneous broadening.