I. Brief Introduction

- Communications and Multimedia Lab. (CMLab.) was founded in Feb. 1991 at Department of Computer Science and Information Engineering (CSIE) National Taiwan University – the first and the largest academic Lab., which focused on, Multimedia and Networking researches in Taiwan. (Currently, CMLab. has 7 faculty members, 3 post Ph.D.s, 80 M.S./Ph.D. students, and 3 assistants.)
- CSIE department transferred from College of Engineering to College of Electrical Engineering and Computer Science (EECS) in Aug. 2000. (CSIE is the first choice of high-school students who attended the Joint Collegiate Entrance Examination in the category of Computer Science and Engineering)
- Ministry of Education approved GINM to offer M.S. and Ph.D. programs starting at August 2004.
One Undergraduate Department and Multiple Graduate Institutes Structure
## Missions

<table>
<thead>
<tr>
<th><strong>Education</strong></th>
<th>Nurturing first-class information technology professionals, specifically, in the area of Networking and Multimedia.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research</strong></td>
<td>Multiple-discipline researches among the faculties within the NTU or with other universities (Taiwan and other Nations) are encouraged to foster innovative, high-quality and advanced research.</td>
</tr>
<tr>
<td><strong>University-Industry Collaboration</strong></td>
<td>The curriculum has been designed to minimize the gap between the industry and academia. Specifically, academic-industrial collective research projects are strongly encouraged. GINM encourages the interaction with industries and the technology transfer to industries in hopes of advancing the research capability of industries.</td>
</tr>
</tbody>
</table>
III. Current Status

A. Faculty

Full-time: 37 (joint with CSIE(19), EE(3), GICE(6), GIEE(2), Depart IM(1))
Adjunct: 3
Ph.D. Degree: 40
TEL: +886-2-33664899
FAX: +886-2-33664898
http://www.inm.ntu.edu.tw

Director

Professor Ja-Ling Wu
Ph.D., Ta-Tung Institute of Technology, Taiwan
E-mail: wjl@csie.ntu.edu.tw
Address: No.1, Sec 4, Roosevelt Rd., Taipei, Taiwan 106
Homepage: http://www.cmlab.csie.ntu.edu.tw/cml/dsp/prof-wu/
GINM comprises 37 full-time faculties (including nineteen faculties from Department of CSIE, three faculties from Graduate Institute of Electrical Engineering, six faculties from Graduate Institute of Communication Engineering, two faculties from Graduate Institute of Electronics Engineering, and one faculty from the Department of Information Management), 6 of them are dedicated to GINM. All the GINM faculties hold Ph.D. degrees.

Full-Time Dedicated Faculty members:

<table>
<thead>
<tr>
<th>Professors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ja-Ling Wu</td>
<td>Ph.D., Ta-Tung Institute of Technology</td>
</tr>
<tr>
<td>Ming Ouhyoung</td>
<td>Ph.D., University of North Carolina, Chapel Hill</td>
</tr>
<tr>
<td>Yi-Ping Hung</td>
<td>Ph.D., Brown University</td>
</tr>
<tr>
<td>Associate Professor</td>
<td></td>
</tr>
<tr>
<td>Ai-Chun Pang</td>
<td>Ph.D., National Chiao-Tung University</td>
</tr>
<tr>
<td>Assistant Professors</td>
<td></td>
</tr>
<tr>
<td>Chi-Sheng Shih</td>
<td>Ph.D., University of Illinois at Urbana-Champaign</td>
</tr>
<tr>
<td>Chih-Wen Hsueh</td>
<td>Ph.D., University of California, Irvine.</td>
</tr>
</tbody>
</table>

(Three more faculty members are in the process of recruiting.)

Three adjunct faculties have joined GINM since August 2005.
B. Facilities

The GINM maintains an array of powerful computers and software for instruction, as well as research laboratories maintained by individual faculty. The facilities are available to all students and faculties. They include SGI workstations, laptop computers, desktop computers, network traffic analyzers, V8 and Hi8 video recorders, digital cameras, digital video camcorders, scanners, 3D scanners, VHS/LD/DVD video player/recorders, video editors, audio mixers, VCD/MP3 testing platforms, and Sony PSII. In the coming years, GINM will continue expanding its facilities to serve its educational and research mission. The faculties in GINM lead six laboratories:

Communications and Multimedia Laboratory, Embedded Systems and Wireless Networking Laboratory, Image Processing and Pattern Recognition Laboratory, Network Security Laboratory, Architecture and Compiler Technology Laboratory and Computer Graphics Laboratory (Department of IM).
C. Programs Requirements and Courses

GINM offers graduate programs leading to the degrees of Master of Science (MS) and the Doctor of Philosophy (PhD). Students must complete course work or proficiency courses. All the courses in the GINM are divided into three categories: multi-media technology category, networking technology category, and systems and application category.

<table>
<thead>
<tr>
<th>Master degree</th>
<th>The MS requires <strong>24 units of course work</strong> (one unit equals one semester hour) excluding seminar, individual study, and thesis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D. degree</td>
<td>The PhD program requires <strong>30 of semester hour units</strong> and the completion of a doctoral thesis under the direction of an approved thesis advisor and with the guidance of a doctoral committee. Students must complete at least 18 units of course work and the remainder are thesis research. PhD candidates must also satisfy a <a href="#">core course requirement</a>, pass the qualifying and preliminary examinations and must successfully defend the doctoral thesis at the final examination. Candidates who do not complete an Master of Science in computer science as part of their graduate program or enter the GINM doctoral program without an approved MS in computer science or related area, are required to complete 12 additional units (42 units in total).</td>
</tr>
<tr>
<td>Multimedia</td>
<td>BASIC</td>
</tr>
<tr>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td>Digital Communications and Computing</td>
<td>Digital Image Processing</td>
</tr>
<tr>
<td>Information Theory and Coding Techniques</td>
<td></td>
</tr>
<tr>
<td>Networked SoC Embedded Software Design</td>
<td>Hardware Software Codesign, Multiagent Systems, …</td>
</tr>
<tr>
<td>Operating Systems</td>
<td>Advanced Operating System</td>
</tr>
<tr>
<td>Database Systems</td>
<td>Information Retrieval and Extraction</td>
</tr>
</tbody>
</table>
D. Students

<table>
<thead>
<tr>
<th>Year</th>
<th>M.S. Program</th>
<th>Ph.D. Program</th>
<th>Industry-specific MS Program (joint with Depart. CSIE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>22</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>2005</td>
<td>32</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>2006</td>
<td>35</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>
E. Awards

• Prof. Ai-Chun Pang: **Excellent Teaching Award**, National Taiwan University, 2005.
• Prof. Yi-Ping Hung: **Best Paper Awards**, CVGIP-Academic Society Taiwan, 2005.
• Prof. Ja-Ling Wu and Prof. Ming Ouhyoung: **Fu Ssu-nien Award** (for contributions to Industry-University Cooperative Research), National Taiwan University, 2005.
• Prof. Ja-Ling Wu: **Outstanding Faculty Award of Electrical Engineering**, 2005.
IV. Research and Services

A. Research
   1. Research Areas
2. Related Research Labs.

- Communications and Multimedia Lab.
  (Profs. Ja-Ling Wu & Ming Ouhyoung)
- Image and Vision Lab.
  (Profs. Yi-Ping Hung)
- Embedded Systems and Wireless Networking Lab.
  (Profs. Ai-Chun Pang & Chi-Sheng Shih & Chih-Wen Hsueh)
3. Large Scale Projects

- Program for Promoting Academic Excellence of University (Phase II)-Content Science for a Media-Rich Life.
- NTU Center for Information and Electronics Technologies- Multimedia Integration Laboratory.
- The National Science & Technology Program for Telecommunications (NTP)
4. Selected Research Results:

Image and Vision Lab (Prof. Yi-Ping Hung)

Multi-Resolution Displays

Virtual Exhibition

Visual Surveillance

Computer-Human Interaction
Embedded Systems and Wireless Networking Lab (Prof. Chi-Sheng Shih)
Embedded Systems and Wireless Networking Lab (Prof. Ai-Chun Pang)
SoCOS Architecture

Embedded Systems and Wireless Networking Lab. (Prof. Chih-Wen Hsueh)
Communications & Multimedia Lab.
(Prof. Ja-Ling Wu & Prof. Ming Ouhyoung)
Communications & Multimedia Lab.
(Prof. Ja-Ling Wu & Prof. Ming Ouhyoung)

X3D Library

(a) 
(b) 
(c) 
(d) 
(e) 
(f) 
(g) 
(h)
Content Analysis and Adaptation

Communications & Multimedia Lab.
(Prof. Ja-Ling Wu & Prof. Ming Ouhyoung)
Emotional Event Detection

Communications & Multimedia Lab.
(Prof. Ja-Ling Wu & Prof. Ming Ouhyoung)
DiffServ and Multi-source
The jGL ES

Communications & Multimedia Lab.
(Prof. Ja-Ling Wu & Prof. Ming Ouhyoung)
Geta Sandal and Location-aware

(a) Straight movement

(b) Movement at corner

Higher probability

Communications & Multimedia Lab.
(Prof. Ja-Ling Wu & Prof. Ming Ouhyoung)
Dietary-aware Dining Table

• A Smart Sensor Surface
  – Sensors (RFID sensor, Load sensor)
  – Detecting user activities on it.

• Dining Table
  – RFID sensor is used to recognize the objects (container, food, etc.)
  – Load sensor is used to detect the weight and weight transfer on the table
## B. Services

### Prof. Ja-Ling Wu

- International Journal of Electronic Imaging: Editor
- Journal of Information Science and Engineering: Editor
- IEEE Consumer Electronics Society-Taipei Chapter: Chairman

### Prof. Ming Ouhyoung

- Guest Editor
  - Special Issue on Search and retrieval of 3D content and associated knowledge extraction and propagation, 2006.
  - EURASIP Journal on Applied Signal Processing (EURASIP JASP) Program Co-Chair
  - 2006 PacificGraphics Conference (PG2006), Program Committee Member
  - PacificGraphics, 2000-2005,
  - ChinaGraph, 2000-2005
- General Co-Chair
  - International Conference on Artificial Reality and Tele-existence (ICAT), 2000-2005/1/18
  - International Conference on Computer Graphics and Imaging (CGIM), 2003-2005
Prof. Yi-Ping Hung

- Program Co-Chair, Multimedia Track, Third Taiwanese-French Conference on Information Technology (TFIT), Nancy, France, March 28-30, 2006
- Area Chair, Seventh Asian Conference on Computer Vision (ACCV’06), Hyderabad, India, January 22-25, 2006.
- Advisory Committee Member, Asian Conference on Computer Vision (ACCV’02), Melbourne, January 2002.
- Program Committee Member: ICPR’06, ICCV’05, MVA’04, ICMI’04, ICPR’04, ACCV’04, ICCV’03, ICRA’03, ICPR’02, MVA’02, ICCV’01, ICDAR’01, MVA’00, ICPR’00, etc.
- Directorate, the Chinese Image Processing and Pattern Recognition Society, 1997 – present
Prof. Ai-Chun Pang

- Guest Editor: IEEE Wireless Communications Special Issue on Voice over Wireless Local Area Network
- Conference Committee:
  - IEEE Wireless Communications and Networking Conference (WCNC) 2007
  - International Conference on Mobile Computing, Communications, and Applications (ICMOCCA) 2006
  - IEEE International Conference on Sensor Networks Ubiquitous and Trustworthy Computing (SUTC) 2006
  - International Conference on Communications, Circuits and Systems 2005 (ICCCAS),
  - The 11th International Conference on Parallel and Distributed Systems (ICPADS-2005),
  - IADIS Web Applications and Research (WARC2005) Conference
  - The Third IASTED International Conference on COMMUNICATIONS AND COMPUTER NETWORKS (CCN 2005)
  - Mobile Computing Workshop 2004 and 2005
- Workshop Chair: The IEEE International Workshop on Mobility, Agents, and Mobile Services
<table>
<thead>
<tr>
<th><strong>Prof. Chi-Sheng Shih</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Committee member for RTCSA 2004, 2005, and ICPADS2005,</td>
</tr>
<tr>
<td>• Publicity chair for RTAS 2005.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Prof. Chih-Wen Hsueh</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Publication Chair: EEE04</td>
</tr>
<tr>
<td>• Registration Coordinator: RTAS 2001</td>
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<tr>
<td>• Program Co-chair: RTCSA 2006</td>
</tr>
</tbody>
</table>
## V. Future Developments

<table>
<thead>
<tr>
<th>Education</th>
<th>The <strong>curriculum</strong> of GINM should be evolutionary enhanced so that the students graduate with most needed <strong>Networking and Multimedia technology skills, cultivated skills and hands-on experience.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>GINM seeks the <strong>cooperation</strong> with <strong>research institutes/universities</strong> in the country and <strong>all over the world</strong>. GINM also accepts the admission from foreign countries and welcomes the faculty member from foreign countries. GINM should be <strong>recognized throughout the world as a leader in the research of networking and multimedia</strong> in the near future.</td>
</tr>
<tr>
<td>Industrial-academics collaboration</td>
<td>For cooperation with research institutes and industry in the country, GINM pursues the cooperation with other departments/institutes within NTU to promote the research results to the industry. Through the interaction with the industry, the research agenda in GINM will be highly related to the research and design needs of the industry so as to advance the technology development.</td>
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</tbody>
</table>