Introduction to the
CUHK MoE-Microsoft National Key Laboratory for
Human-Centric Computing & Interface Technologies

Helen Meng, Co-Director
Associate Dean of Research, Faculty of Engineering
Professor, Dept. of Systems Engineering & Engineering Management
The Chinese University of Hong Kong
CRA Conference 2008
Introduction to CUHK
Introduction to CUHK

- Comprehensive research university
- Founded in 1963
- 18,600 students (9,800 undergraduates, 8,800 postgraduates), over 80,000 alumni
- Over 1,900 teaching and research staff
Comprehensive Programs

- Faculties: Arts
  - Business Administration
  - Education
  - Engineering
  - Medicine
  - Science
  - Social Science
  - School of Law
- 61 academic departments
- Over 300 undergraduate & postgraduate programs
Unique Features

- Bilingualism: Chinese and English languages
- Bi-culturalism: meeting points of east & west
- College system
- General education programs in Colleges
Intro to CUHK Faculty of Engineering
History of the Faculty

Established in 1991 by Professor Charles Kao, "father" of Optical Fiber Communication and former Vice-Chancellor of CUHK

Focus on Information Technologies
Departments in the Faculty

Computer Science & Engineering (since 1973)
Electronic Engineering (since 1970)
Information Engineering (since 1989)
Mechanical and Automation Engineering (since 1994)
Systems Engineering & Engineering Management (since 1991)

110 faculty members
1600 undergraduates (15.3% non-local)
420 research students (70% PhD)
R&D Centers

- Center for Advanced Research in Photonics
- Center for Innovation & Technology
- Center for Micro and Nano Research
- Center for Logistics Technologies and Supply Chain Optimization
- Distributed Digital Entertainment Center
- Institute of Optical Science and Technologies
- Institute of Precision Engineering
- Institute of Theoretical Computer Science and Communications
- Joint Center for Intelligent Sensing and Systems
- Microsoft-CUHK Joint Laboratory for Human-centric Computing and Interface Technologies
- Mobile Technologies Center
- R&D Center for Supply Chain and Logistics Management
- Shun Hing Institute of Advanced Engineering
R&D Centers – cont’d
(collaboration with Mainland China)

• CUHK/CAS Shenzhen Institute of Advanced Integration Technologies (since 2007)
  – Partnership with Chinese Academy of Sciences and the Shenzhen Municipal Government
• CUHK-Tsinghua Joint Research Center on Media Sciences, Technologies and Systems (since 2007)
• CUHK-Tsinghua Joint R&D Program on Chinese Enterprise and Internet Operations (since 2006)
• Joint Center for Intelligence Engineering (since 1999)
  – Partnership with Peking University
Introduction to the Microsoft-CUHK Joint Laboratory
Background

• Before 2005
• **Individual** collaborative efforts between CUHK faculty members and MSRA researchers
  – Mutual visits, seminars, e.g. MS Computing in the 21st Century Conference, MSRA Faculty Summit
  – Co-organized workshops
  – Internship opportunities in Beijing
  – MSRA alumni enrolled in CUHK doctoral program
• Student awards and research grants from Microsoft
  – Microsoft Fellows
  – Microsoft Student Ambassador of Hong Kong
  – Microsoft Imagine Cup Championship 2004
  – Research grants in computer graphics, computer speech and language, etc.
• Motivation to consolidate administration and logistics
Theme: Human-Centric Computing and Interface Technologies

- Embrace users’ informational needs and natural communicative modalities at the heart of ICT development
- Information and communication technologies
  - Unification of content, computing, communication
- Users’ informational needs
  - Accessible, searchable, secure, adaptable
- Natural communicative modalities in user interfaces
  - Vision, hearing, touch, etc.
  - Human-computer interaction to resemble human-human interaction → multimodal communication
Establishment of MS-CU-JL (May 05)

- **Mission**
  - Build cohesion among the research areas of common interest to CUHK and MSRA, under the umbrella of human-centric technologies
  - Expand cohesion into an open, innovative research program that connects and inspires researchers from both institutions
  - Long-term, strategic research direction that unleashes the power of computing, communication and content for the benefit of our society

- **Research agenda – five thematic areas**
  - Computer vision (计算机视觉)
  - Computer graphics (计算机图形学)
  - Speech and multimodal UI (语音处理及多模态用户界面)
  - Multimedia processing and retrieval (多媒体信号处理与检索)
  - Networking and wireless communications (网络与无线通信)
International Advisory Board

Professor Andrew YAO   姚期智教授
Distinguished Professor-at-large
The Chinese University of Hong Kong
(Chairman)

Professor Fred JUANG   庄炳湟教授
Motorola Foundation Chair Professor and
Georgia Research Alliance Eminent Scholar
School of Electrical and Computer Engineering
Georgia Institute of Technology

Professor Victor ZUE   舒维都教授
Professor of Electrical Engineering and Computer Science
Co-Director, Computer Science and
Artificial Intelligence Laboratory
Massachusetts Institute of Technology
Organization (3): Members

- 38 faculty members, 2 Adjunct Professors (co-supervision)
- 57 continuing students (21 MPhil and 36 PhD)
- 24 graduates (11 MPhil and 13 PhD)
- Across five departments in the Faculty of Engineering
  - Computer Science & Engineering
  - Electronic Engineering
  - Information Engineering
  - Mechanical & Automation Engineering
  - Systems Engineering & Engineering Management
- 12 incoming intern students from mainland and overseas (e.g., Korea, India)
Research Grants and Outputs
MSRA Grants and Joint Publications

• Trustworthy Computing (2006-2007)
  "On Security Issues of Network Coding"
  – Profs Dah-Ming CHIU and John LUI

• Gaming & Graphics (2006-2007)
  – “Text Synthesis and Image Completion on Programmable Graphics Hardware (GPU)”
  – Profs Jiaya JIA, P.A. HENG and T.T. WONG
    from August 2006 to August 2007

• ASIA-SIGNOPEDIA (2007-2008)
  “An Online Sign Language Knowledge Base Composed Collaboratively by Internet Users”
  – Profs Ronald CHUNG and Gladys TANG

• Natural Language Processing (2008-2009, new)
  – Profs Irwin King and Jimmy Lee
  – from August 2008 to July 2009

• Joint Publications
  – Over 140 conference and journal publications between 2005-2007
Student Awards

• Microsoft Fellows
  – Support young research talents, reward high-potential graduate students in early career (funding and internship in Beijing), build community for academic exchange
  – Prestige: 120 recipients from 39 universities across 8 countries in Asia-Pacific (1999-2004 statistics)
  – CUHK Fellows:
    - Yao Qian (03), Ida Hui (04), Zhenzhong Chen (05), Wei Liu (06)
    - Kelvin Chan (07)
Collaborative Activities
Conferences

• Annual Microsoft Joint Laboratory Symposium
  – 1 Dec 2006 at CUHK
  – 13 January 2008 at Harbin Inst. of Tech.
  – Participants

• Representatives from Ministry of Education, MSRA and 8 universities (CUHK, Harbin Inst of Tech., HKUST, Peking University, Shanghai Jiaotong, Tsinghua, USTC, Zhejiang U)
Conferences (2)

- Beijing-HK International Doctoral Forum
  - Jointly organized by Tsinghua University & CUHK
  - Support from Ministry of Education and MSRA
  - Theme: “Network and Media Computing”
  - 2006 in Tsinghua University, Beijing
Conferences (3)

- Beijing-HK International Doctoral Forum
  - 2007 at CUHK
  - Over 100 participants
Conferences (4)

• MSRA 10th Anniversary Innovation Forum
  – August 2008
  – Keynote speech by Dr. Bill Gates
  – Panel discussion among Dr. Bill Gates and Presidents of CUHK, HKU and HKUST. Topic of discussion is “Technology & Society”
Seminars

• Distinguished Lecture Series
  – MSRA
    Dr Harry SHUM on Research 2.0
  – Georgia Institute of Technology, USA
    Professor Fred Juang on Pattern Recognition
  – Rutgers University, USA
    Professor Lawrence Rabiner on Multimedia Communications
  – University of Sheffield, UK
    Professor Roger Moore on Language Processing

• Seminar Series (partial listing)
  – MSRA
    Dr. Frank K. Soong on Hidden Markov Models
    Dr. Sing Bing Kang on Interactive Visual Media
    Dr. Shipeng Li on Interactive Media
  – Honda Research Institute Japan Co., Ltd.
    Dr. Mikio Nakano on Model for Conversational Robot Intelligence
Short Courses

• MSRA 2006 Summer Course in Harbin Institute of Technology Shenzhen Graduate School
  – CUHK
    Professor Helen Meng
    Multilingual Spoken Dialog Systems

• At CUHK
  – University of California, San Diego
    Professor Alon Orlitsky
    Universal Compression and Probability Estimation
  – University of Southern California
    Professor Jay Kuo
    Advanced Video Coding and Emerging Visual Capturing and Display Technologies
Mutual Visits

- CUHK delegation visited Microsoft Research, Redmond (9.2005)
- Microsoft Research delegation visited CUHK’s technology exhibition (11.2005)
Visiting Students

- **Internships at MSRA**
  - 5 students to Beijing per year

- **Visiting students**
  - Tsinghua University, Peking University, Beijing Jiaotong University, Zhejiang University, USTC, Huazhong UST, IIT etc.

- **Summer Program – Research in Industrial Projects (RIPS)**
  - Organized by MSRA, CUHK and UCLA
Intellectual Property

- Research output mostly published in joint papers
- Joint Research IP resulting from cooperative efforts
  - Subjective to specific agreement between the two parties
  - Both parties are free to license to third parties without obligations to pay royalties to the other
Recognition
MoE-Microsoft National Key Laboratory

• MoE-Microsoft Great Wall Plan
  – Work with academia to nurture young talents in China
  – Joint labs may be evaluated for National Key Laboratory Status

• Upgrade in May 2008
  – CUHK MoE-Microsoft National Key Laboratory for Human-centric Computing and Interface Technologies
  – Two other partner labs from Peking University and Shanghai Jiaotong University

• Future Plans
  – Joint research, joint publications, co-supervision, expanding the collaboration within the (expanding) network of the joint laboratories
  – Cross-disciplinary research
谢谢
Thank you