

Microsoft
Research



Microsoft Research Asia
Faculty Summit 2010



Microsoft Research Update

Rick Rashid

Senior Vice President

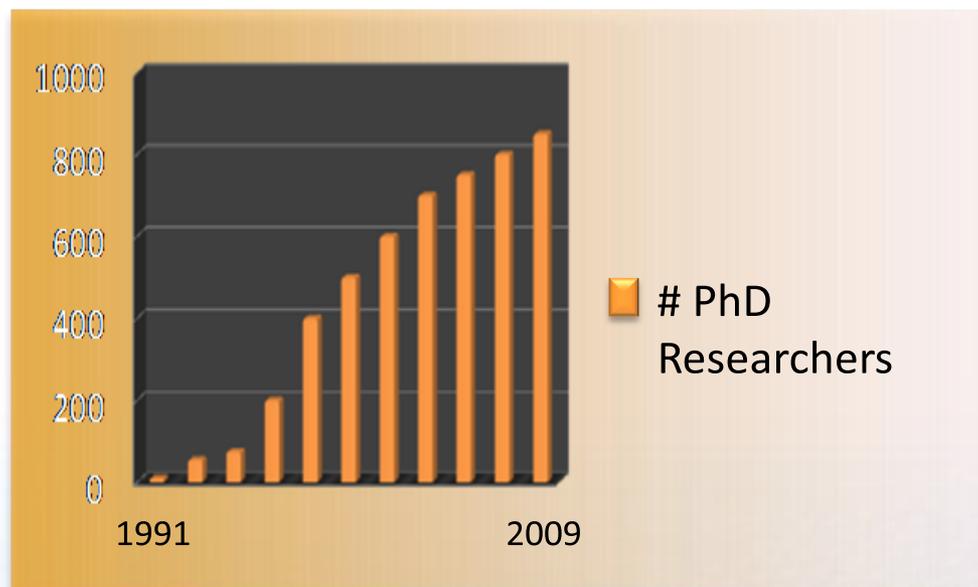
Microsoft Research

MSR Mission Statement

- Expand the state of the art in each of the areas in which we do research
- Rapidly transfer innovative technologies into Microsoft products
- Ensure that Microsoft products have a future



Microsoft Research



MSR India



MSR New England



MSR Asia

Research locations

- Redmond, Washington (Sep, 1991)
- San Francisco, California (Jun, 1995)
- Cambridge, United Kingdom (July, 1997)
- Beijing, China (Nov, 1998)
- Silicon Valley, California (July, 2001)
- Bangalore, India (Jan, 2005)
- Cambridge, Massachusetts (July, 2008)



Organizing for Innovation

- University organizational model
 - Flat structure, critical mass groups
- Open research environment
 - Aggressive publication of results in peer-reviewed literature
 - Frequent visitors, daily seminars
- Strong ties to University Research
 - Nearly 15% of basic research budget directly invested in universities
 - Lab grants, research grants, fellowships, etc.
 - Hundreds of interns and visitors

Expanding the State of the Art

- Over 40 peer-reviewed publications
 - 13% of papers at 2009 CHI (UI)
 - 22% of papers at 2009 SIGCOMM(Communications)
 - 28% of papers at 2009 SIGIR (Info retrieval)
 - 32% of papers at 2009 SOSP (Operating Systems)
- Community leadership
 - Professional societies
 - Journals
 - Conferences

Talent



- 1 Fields Medal
- 4 Turing Awards (new: Chuck Thacker, 2009)
- 2 Draper Prizes
- 2 IEEE Emanuel R. Piore Awards
- 1 Kyoto Prize in Advanced Technology
- 4 Royal Academy of Engineering Awards
- 2 John von Neumann Medals
- 1 National Academy of Sciences Award
- 1 MPAA Academy Award (Oscar)
- 20 ACM Fellows
- 11 IEEE Fellows
- 3 Royal Society Fellows
- 15 Nat'l Academy of Engineering Fellows
- 3 Amer. Acad. of Arts & Sciences Fellows
- 1 CHI Lifetime Achievement Award
- 1 Foreign Member, Royal Swedish Academy of Sciences
- 1 Amer. Assoc for Adv. Of Science Award
- 1 Order of the British Empire

- **Chuck Thacker, 2009 ACM Turing Award**
- Butler Lampson, *1992 ACM Turing Award*
- C.A.R. Hoare, *1980 ACM Turing Award*
- Gary Starkweather, *Inventor of the laser printer*
- Jim Blinn, *Graphics pioneer*
- Michael Freedman, *Fields Medal winner*
- Gordon Bell, *Father of the VAX*
- Bill Buxton, *ACM CHI Lifetime Achievement Award*
- Rick Rashid, *creator of the MACH Kernel*



Value of MSR to Microsoft

- Source of IP and new product technologies
 - MSR generates roughly 25% of the Company's patents and generally MSR patents are more "fundamental"
- Problem solving
 - Ability to bring smart people to bear rapidly on hard problems confronting products, product groups or the company
- Early warning system
 - Ears to the ground in new areas across a broad range of technologies

Driving Technologies into Products

- Focused technology transfer effort
 - Program management team with sole focus on tech transfer
- Researchers on product incubation “advisory” boards
- “Mindswaps” – joint product/research offsites
- Joint product/research teams, e.g.
 - ClearType (Windows XP)
 - Datamining (SQL 2000)
 - Natural Language & Speech (Office)
 - TabletPC
- Incubations
 - Robotics Studio, ResponsePoint, etc.



Tech Transfer Examples

Windows

- Virtual WiFi
- East Asian handwriting recognition
- DirectX 11
- Smart correction for Tablet PC
- Static Device Verifier
- Network Map
- Automatic identification of songs(WMP11)
- Ink Parsing architecture
- Algorithm for Phish Detective (IE 7)
- Windows Audio Improvements (acoustic echo cancelation, speech enhancement, microphone arrays)
- Desktop search
- UI: Carousel view, 3dish card shuffle interface, CardSpace
- WiFi simple configuration
- IPv6
- ProbeGap
- Compound TCP
- Peer name resolution protocol
- Windows Media Photo

Bing

- Categorized search
- Local search classifier
- Ranking
- Toolbar parser
- Improved relevance
- Session memory
- Search galleries
- Sentiment extraction

Microsoft Office 2010 & 2007

- Image background removal
- SQM data analysis
- Search relevance ranking improvements (SPS)
- Speller improvements
- Speech
- Ribbon UI
- Smart Chart Labels in Excel

Other Contributions to Products

- Speech: recognition & synthesis
- Xbox Graphics , net probing
- Cryptography libraries
- Windows Media Format audio codec
- Handwriting recognition
- Information retrieval for SPS, MSN
- Development tools

Key Challenges for the Future

- Platform Elements
 - Networking, distributed systems, operating systems
 - Cell phone and other devices
 - Sensor networks
 - Security, cryptography, protection against malware
- Reinventing Software Development
 - Languages, tools, compilers
 - Collaborative development
- Data and Documents
 - Database architectures, data mining
 - Search
 - Fighting spam & phishing
- User Interfaces, Social Computing, and Collaboration
 - New UI – speech, ink, gesture, natural language, large displays, surface computing
 - Meetings and collaboration
 - Modeling people, groups, info
 - Technologies for emerging segments
- Media
 - Graphics and multimedia
 - Digital photography and video
- Science & healthcare
 - Quantum computing, astronomy
 - Algorithms, cryptography
 - AIDS vaccine, memory loss
 - Education

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Update of Microsoft Research Asia

Hsiao-Wuen HON
Managing Director
Microsoft Research Asia



MSR Asia in the Past 12 Years

- Founded on Nov. 5th, 1998
- 3000+ papers published on top-tier journals / conferences, 20+ best paper awards
- 300+ technologies transferred to MS products
- 20+ technologies licensed to other companies



Academic Achievement

Extensive publication: over 3000 publications to date

- CVPR 2010/09/08/07 20/8/15/16 papers
- SIGIR 2010/09/08/07 5/8/8/7 papers
- SIGGRAPH 2010/09/08/07 7/6/8/7 papers
- WWW 2010/09/08/07 6/9/8/6 papers
- ACL 2010/09/08/07 4/6/5/4 papers
- SIGKDD 2010/09 3/7 papers
- ACM Multimedia 2009/8/7 6/8/8 papers
- NIPS 2009 5 papers
- COLING 2010 10 papers
- SIGMOD 2010 5 papers
- ACM Multimedia 2010 6 papers
- Mobicom 2009 over 10% of papers
- Best paper awards in ACM Multimedia, IEEE RTAS, ICDAR, IEEE CSVT, NSDI'09, CVPR, ACCV, CIKM, ...

Academic Community

- Extensive visitors and speakers program
- Professional Services: TVCG, PCM, WWW, SIGIR, SIGGRAPH, Mobicom, CVPR, ...

People and Research Areas



Hsiao-Wuen HON

Machine Learning
Zheng CHEN

Speech
Frank SOONG

Engineering
Jonathan TIEN

Technical Strategy
Eric CHANG



Baining GUO

Visual Computing - Yi MA

Graphics - Baining GUO

Multimedia - Shipeng LI, Feng WU

Theory - Baining GUO



Weiyong MA

Web Search & Mining, Natural Language Processing –
Weiyong MA, Ming ZHOU, Hang LI, Jirong WEN,
Chin-yew LIN

Human Computer Interaction - Desney TAN



Feng ZHAO

System - Zheng ZHANG, Lidong ZHOU

Network & Wireless - Yongguang ZHANG

Hardware - Feng-Hsiung HSU

Software Analytics - Dongmei ZHANG

Computing in the Next 10 years

- 3 Screens + 1 Cloud
 - Software + Service
 - Rich client (device) experience
 - Internet services - software as a service
 - Emails, IM's, internet search, ...
 - Clients + Cloud experience
 - Clients are becoming more powerful and capable
 - Services in the cloud provide efficiency, scalability and redundancy



Demo: Microsoft Kinect



**KINECT
SPORTS**



Demo: Microsoft Kinect



**KINECT
SPORTS**



Computing in the Next 10 years

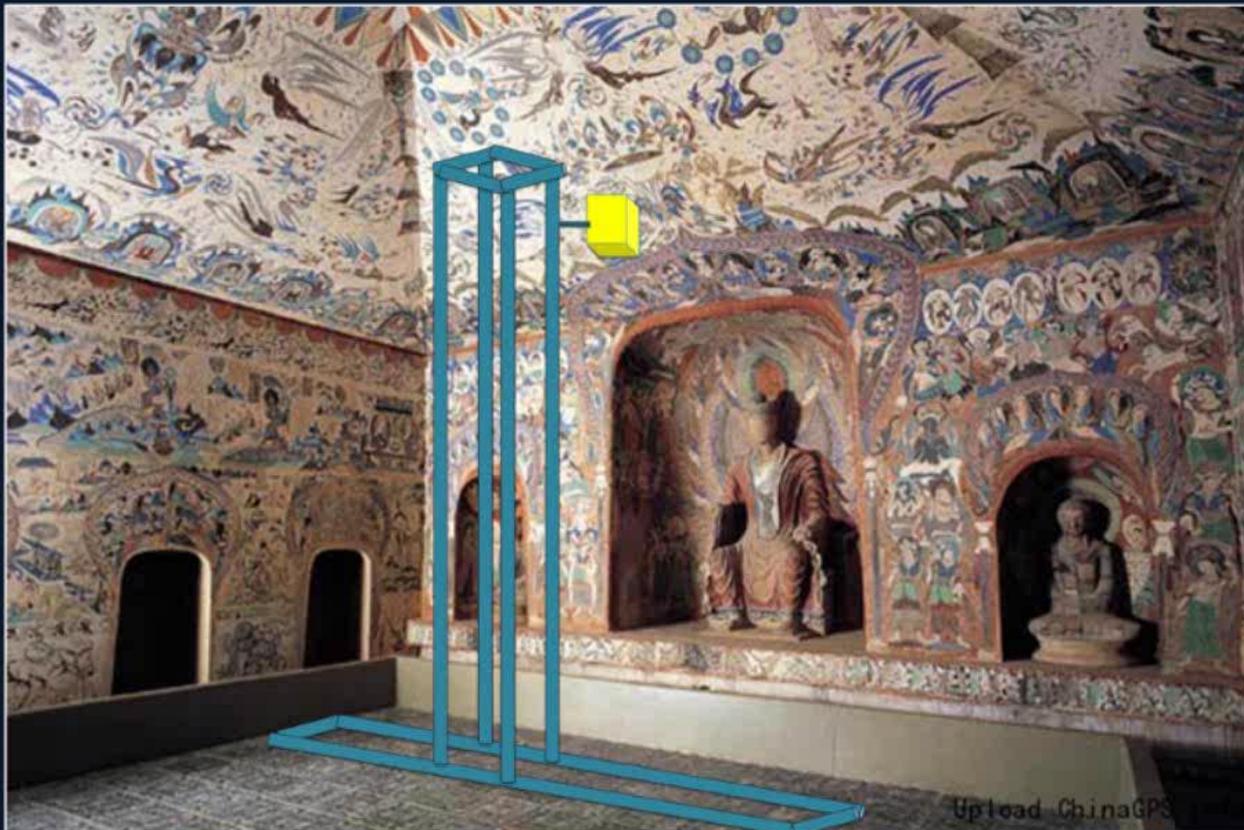
- Inter-disciplinary and multi-disciplinary
 - Tough computing challenges span across disciplines
 - New technology/business opportunities:
 - eHeritage
 - Education
 - Healthcare
 - Environment



Demo: eHeritage



Demo: eHeritage



Internet photo

Opportunities in Asia



Strong focus on education & engineering



Big talent pool



Largest Internet and mobile phone user population



Aspiration to innovate technologies for Asia and the world

Turning Ideas into Reality

Poised to lead
the next decade
of innovation

Committed to
a continued
partnership
with academia

Together
we Innovate!

THANK YOU!