Microsoft Research - Advancing Science and Technology Through Worldwide Collaboration

P. Anandan
Distinguished Scientist and Managing Director
Microsoft Research India
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

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)
- EMIC, Germany (2003)
- Bangalore, India (Jan, 2005)
- CMIC, Egypt (2006)
- 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
Microsoft Research Connections

**Worldwide Head:** Dr. Tony Hey

**Computer Science**
Fostering innovative research to advance social and human potential

**Earth, Energy, and Environment**
Accelerating scientific insights that advance our understanding of the natural world

**Health and Wellbeing**
Applying advanced computing technologies to improve health and wellness

**Natural User Interface**
Exploring human-centric ways for people to interact with future computing paradigms

**Education and Scholarly Communication**
Empowering the academic community with innovative tools and technologies
A Few Examples of Initiatives
The Microsoft Biology Foundation (MBF) is a language-neutral bioinformatics toolkit built as an extension to the Microsoft .NET Framework to help researchers and scientists work together and explore new discoveries. This open-source platform serves as a library of commonly-used bioinformatics functions. MBF facilitates collaboration and accelerates scientific research by enabling different data sets to communicate. Several universities and corporations use MBF tools, which help reduce processing time and enable scientists to focus on research.
World Wide Telescope:
Enabling the world to see the Universe

Image of Mars

Horse-head Nebula
At A Glance

Full-time staff total: 56

Technical staff: 48
- 34 with PhD (69%)

Total interns (6 years): ~500
- Indian universities: 60%
- Foreign universities: 40%
- PhD candidates: 43%
- Bachelors/Masters: 57%

GROUPS
- Algorithms
- Cryptography, Security, and Applied Mathematics
- Rigorous Software Engineering
- Mobility, Networks, and Systems
- Multilingual Systems
- Technology for Emerging Markets
- Vision, Graphics and Visualization
- Advanced Development
- MSR India Connections
Publications and Collaborations

In 2010, 109 papers

More than 120 co-authors from outside MSR

Collaboration with over 50 Institutions

IISc, IITs, BITS, DAIICT, IIITs, MIT, CMU, UC Berkeley, UW, Yale, Cambridge, Chicago, Bristol, National University of Singapore, Institute of Mathematical Sciences, Oxford, Georgia Institute of Technology, Princeton, New York University, University of Maryland, McGill University, U. Cape Town, UC Santa Barbara, U Michigan, ...
Goal: Be the leading corporate partner in Computer Science research in India
Strengthen CS Research Ecosystem
• Capacity Building
• Communitywide Research Initiatives

Address Societal Challenges
• Community Engagement
• Social Responsibility

Empower Communities with Technologies
• Help advance research process
• Innovation

Partner with Academia, Industry and Government
MSR India Connections Programs

**Student programs**
- PhD Fellowships
- Travel Grants
- Rx Lab
- Joint PhD Advising
- Raising Star Awards
- ResearchAndYou Portal

**Faculty programs**
- Young Faculty Awards
- Research Collaborations & Grants
- Visiting Researcher

**Events**
- Summer and Winter Schools
- Theory Day
- Research Workshops
- MSR Faculty Summit
- TechVista

**Community Engagement**
- Conference sponsorships
- Software Engineering Tools
- WikiBhasha
- Worldwide Digital Heritage
- HPC and Science
## Highlights

<table>
<thead>
<tr>
<th>Category</th>
<th>Count/Details</th>
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<tbody>
<tr>
<td>Strategic Partnerships</td>
<td>~20 IITs, IIITs, BITs, CMI, IMSc, ISI, etc</td>
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<tr>
<td>Institutes/Colleges reached in CY2010</td>
<td>85</td>
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<tr>
<td>Students touched in 4yrs</td>
<td>34000 85 institutes x 100 students per year x 4 years</td>
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<tr>
<td>Faculty touched in 4yrs</td>
<td>1700 85 institutes</td>
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<tr>
<td>PhD Fellowships awarded since inception</td>
<td>30 6 rounds of awards x 5 awards each</td>
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<tr>
<td>Young Faculty awardees</td>
<td>40</td>
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<td>Internships at MSR India since inception</td>
<td>~500 100 – 120 since last 3 years + 50 average for first 3 years</td>
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<tr>
<td>Attendees at schools</td>
<td>840 5 summer and 2 winter schools x 120 attendees average</td>
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<td>Research exposure through Rx Lab</td>
<td>210 150 in FY10, ~60 in FY09</td>
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A Few Examples of Collaboration on Societal Challenges
WikiBhasha

Multilingual content creation tool for Wikipedia

Also enables community creation of parallel corpora for language research

In collaboration with Wikipedia

Open source tool

Launched in October 2010

Community Program in India, Egypt, Brazil & Mexico
Digital Green

Enable Peer-to-Peer knowledge transfer among farmers

Solution: Locally recorded videos of good farming practices and *ad hoc* screenings in villages

Stockholm Challenge Award 2008

Spun off independent non-profit in 2010: Aiming to impact ~400,000 households in 3 years
Rich Interactive Narratives

- Enable rich, immersive and interactive narratives through the seamless convergence of guided experiences and user exploration.

- Allow user to freely explore interactive content any time in the middle of the narrative.

- Integrate broad-range of media: very high-res images, video, photosynth, maps, documents, etc.

- On-line web based player(s)

- Easy authoring tool(s)

www.digitalnarratives.net
India Digital Heritage Project

- Digital capture, archiving and presentation of Indian cultural heritage
- An India Dept. of Science and Technology Project
- 12 Technology + 11 “Culture” projects
- INR 7 Crore (70 Million) over 3 years
- MSR India catalysed the project and provides technical leadership
Thank you!