

Microsoft® Research

Faculty Summit 2010

Guarujá, Brasil | May 12 – 14 | In collaboration with FAPESP

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Collaborating with Microsoft Research

Dr Daron G Green
General Manager
Microsoft Research

Overview

- External Research: vision/mission
- Focal areas for Microsoft Research's external engagements
note: not an exhaustive summary
- Anatomy of a good project
- How to engage with MSR

ER Vision

Work broadly with the academic and research community to speed research, improve education, foster innovation and improve lives around the world.

Mission

Support university research through collaborative partnerships

Accelerate university research and education through technology investments

Inspire the next generation of researchers and scientists

Drive awareness of Microsoft contributions to research

Strategy

- Work with leading researchers on important scientific discoveries
- Ensure a diverse, world-wide portfolio
- **Exploit, complement, and collaborate with Microsoft research expertise**
- **Leverage Microsoft products and tech.**

- Extend use of MS products in key communities
- **Foster broad deployment and experimentation**
- **Demonstrate application of MS tools to science**
- **Deliver open, interoperable solutions and drive tech transfers**

- Sponsor and participate in events that bring researchers together
- Foster and develop talent and leadership in STEM-D research
- Drive awareness of MS's diversity leadership

- Improve perception of Microsoft in leading research universities
- **Showcase applications of computing to major societal challenges**
- **Leverage our research partners to increase impact and reach**
- Share our message via events, social nets & traditional media

Focal areas for Microsoft Research's external engagements

Focal areas

Regional Outreach/Engagements

Core Computer Science

Earth, Energy and Environment

Education and Scholarly Comm.

Health & Wellbeing

Advanced Research Tools and Services



Health and Wellbeing
Revolutionizing Bioinformatics

Previous bioinformatics project outputs



Jaroslav Pillardy, Computational Biology Service Unit, Cornell University

- BioHPC: Suite of 28 applications modified and adapted for efficient use in an Windows HPC environment with ASP.NET interface
- Currently supports the areas of DNA sequence analysis, protein structure prediction, population genetics and phylogenetics



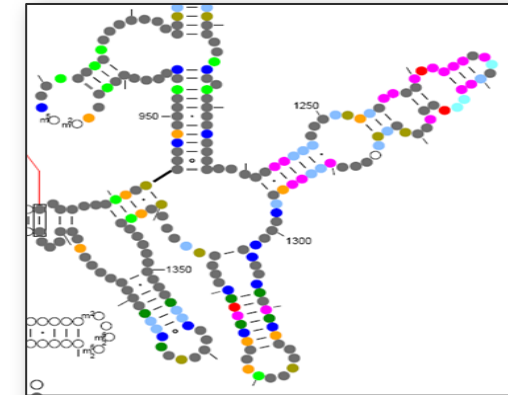
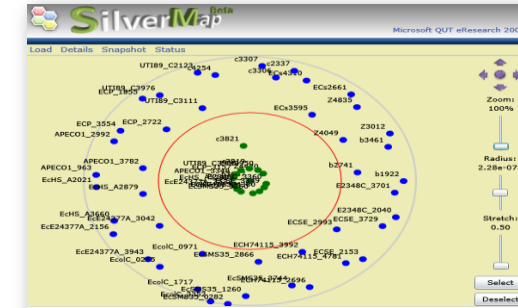
Jim Hogan, SilverMap: Queensland University of Technology

- MQUTer supports research into bioinformatics, sensor networks, visualization and parallelism on the Microsoft platform
- Six new tools – the latest under development using MBF and Silverlight 3 which visualizes DNA sequence similarity and is integrated into MBF (and will shortly be available as an Excel plug-in)



Robin Gutell, Center for Computational Biology and Bioinf., UT Austin

- Suite of tools to explore evolutionary relationships and predict function of RNA molecules
- Available as a website – also a complementary open-source suite of Windows-based tools, under development using MBF (H1 FY11)



+ Cancer Bioinformatics in ER



Marty Humphrey, Department of Computer Science, University of Virginia

- The caBIG platform connects consumers, the care delivery system, and the research community. Close to 60 [NCI-designated Cancer Centers](#) are deploying caBIG® infrastructure and tools, as are 16 [Community Cancer Centers](#) that in the aggregate touch 20 million lives.
- This project pilots caBIG clients on Windows, leveraging and extending MBF, and tutorials demonstrating the value of Microsoft technologies to the caBIG developer and user community.



Convergence on strategic platform for Bioinformatics

research.microsoft.com/en-us/collaboration/tools/mbf.aspx

TCI Bioinformatics projects...

Jaroslav Pillerdy, Computational Biology Service Unit, Cornell University

- BioPAC: Suite of 28 applications modified and adapted for efficient use in an Windows HPC environment with ASP.NET interface
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- MGUfer supports research into bioinformatics, sensor networks, visualization and operations on the Microsoft platform
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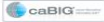
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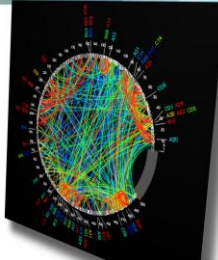


Chasing HIV – to web scale analysis (Tony & David's talks)

InfoTech Research



Tracking the evolution of HIV inside an individual using advanced machine-learning algorithms



Azure engagement through XCG (Azure BLAST, PhyloD services)

Product engagement and prototyping use by TC, HSG

Microsoft Biology Foundation

- **Beta 1: Nov 5, 2009 (MS Connect)**
- **Beta 2: Feb 10, 2010 (CodePlex)**
- **V1 release: July 2010**

- **200+ academics enrolled in TAP**
- **Illumina early adopter**
- **UW (Eichler lab) early adopter**
- **Johnson & Johnson early adopter**
- **Aditi Technologies to partner**

- **HLS, HSG, HPC, TC, .NET all engaged**
- **Bio-IT Alliance partner**

- **Leveraging MSR/MS assets: Pivot, NodeXL, TRIDENT, IronPython, etc**

- **Showcasing MS products: Excel/Office, Visual Studio 2010, .NET 4.0, WPF, Silverlight**

- **Launch at 2010 FacSum**
- **9 keynote presentations planned H2, FY10**
- **Training course in prep**
- **Community ownership**
- **Foundation to future MSR genomics projects**
- **Foundation to all future ER genomics engagements with academia**

Earth, Energy and Environment
Transforming earth sciences

Worldwide Telescope

www.worldwidetelescope.org

World Wide Telescope

Seamless Rich Social Media Virtual Sky
Web application for science and education

- Alyssa Goodman, Astronomer Harvard-Smithsonian Center for Astrophysics
- Alex Szalay, Astronomer Johns Hopkins University
- Curtis Wong, Principal Researcher Microsoft Research
- Jonathan Fay, Principal RSDE Microsoft Research

Goals

- Science- Seamless integration of multi-wavelength, multiple telescope distributed image/data sets and one click contextual access to distributed web information/data sources
- Education- Easy as Powerpoint, rich social media authoring environment within the sky allowing astronomers, educators and kids to create and share rich narrated guided tours of the universe



Worldwide Telescope

Project: Seamless Astronomy at Harvard

Windows Client launched at TED'08

Silverlight Client launched at MIX'09

Over 6 Million unique visitors

TED'10 demo by Blaise to show Bing Maps SL integration with WWT SL

WWT Outreach

WWT at center of China eclipse July '09

Localizations in 5 languages

Community Servers in China & Japan

WWT Coursework developed

Galileo Tour celebrating 400th anniversary launched

WWT Ambassadors program (Harvard & WGBH) NSF funding

NASA Space Act Agreement

NASA provide content in WWT format for Moon and Mars – launch March '10

SAA allowed MS to have more combined marketing

PDC Azure Demo by DPE – Be A Martian, leveraged GalaxyZoo effort

NASA Explorer Schools to adopt WWT Planetarium

WWT|Earth

Visualize environmental datasets


Bring gaming experience to environmental data

Have high-end Rich Internet App to complement Bing Maps

Prototype demo'd at AGU'09

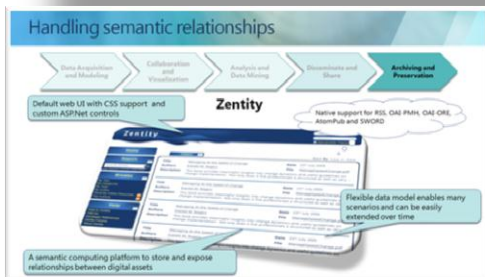
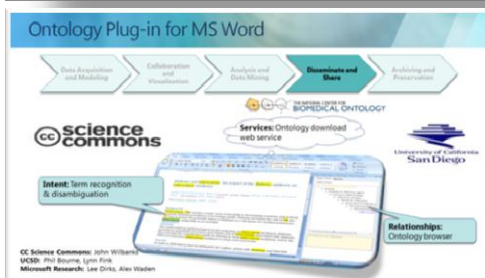
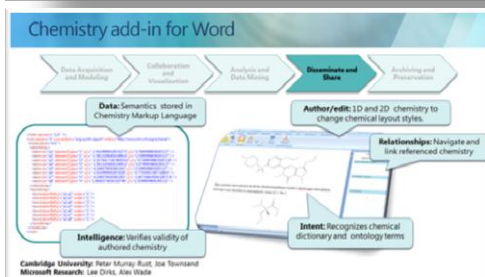
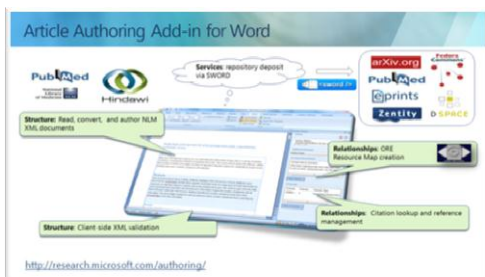
Re-architecture building on Win7, DX11, etc – exposing API

3D Scientific exploration and inquiry tool



Education and Scholarly Communication
Enabling eResearch

Enabling eResearch



eResearch Tools

- Office Add-ins shipped 2008-2009
- Creative Commons for Office
- Article Authoring Add-in
- Ontology Add-in
- Chemistry add-in for Word
- Zenty v1 shipped May09
- RIC Framework shipped Dec09
- In partnership with Public Sector (Higher Education) Team, expand academic partner list to 10-20 institutions running RIC Framework (and Zenty)
- Worldwide Partners: Softtek (Mexico); WinVision (NL); SoftEdge (IRE); Armadillo (UK); OTB (US); @Mire (BE) and others in discussions.
- Leveraging MSR/MS assets: MSRA-Libra Project, NodeXL, Trident, etc
- Showcasing MS product: Office (Word & Excel), SharePoint, SQL Server + ADO.Net

- Launch RIC v1.1 formally with British Library in 7/10
- Launch Chem4Word at ACS Annual Meeting in March 2010 (San Francisco)
- Ongoing series of partner "Airlifts" planned for Brazil and North America

Computer Science

The future of computing

UPCRCs with XCG (+DevDiv, VisualStudio)



- Marc Snir (University of Illinois at Urbana-Champaign)
 - Michael Faiman and Saburo Muroga Professor
 - Director, Illinois Informatics Institute



Applications:

- Tele-immersion, gaming (Smoke 2.0 demo), computer vision, medicine (MRI reconstruction, stroke simulation), parallel browsing, telecommuting, computational finance (auctions, value-at-risk estimation), music

Also...

- Parallel Programming Patterns, Safe parallel programming, Easy tuning, Auto tuning, Architecture, OS, Safe programming, Performance programming



- David Patterson (University of California at Berkeley)
 - E. H. and M.E. Pardee Chair
 - Director, Parallel Computing Laboratory (Par Lab)



Many-core and parallel programming

Project	Organization
MultiCore Center - Rice	Rice University: John Mellor-Crummey
Multicore Center - Indiana	Indiana University: Geoffrey Fox
Multicore Center - Tennessee	University of Tennessee: Jack Dongarra
BSC/MSRC Institute <u>and</u> TM for multicore (BSC)	Barcelona Supercomputing Center- Centro Nacional de Supercomputacion: Mateo Valero
Towards a Solution to the Multicore Challenge	Louisiana State University: Thomas Sterling

Applications using Dryad & DryadLINQ Collaboration with Geoffrey Fox's SALSA team, Indianapolis

CAP3 [1] - Expressed Sequence Tag assembly to re-construct full-length mRNA

Time to process 1280 files each with ~375 sequences

Average Time (Seconds)

Input files (FASTA)

Output files

- Expressed Sequence Tag assembly to re-construct full-length mRNA
- Perform using DryadLINQ and Apache Hadoop implementations

PhyloD [2] project from Microsoft Research

- Derive associations between HLA alleles and HIV codons and between codons themselves
- DryadLINQ implementation

PARALLEL LINEAR ALGEBRA SOFTWARE FOR MULTICORE ARCHITECTURES

PLASMA

INNOVATIVE COMPUTING LABORATORY THE UNIVERSITY OF TENNESSEE

THE PARALLEL LINEAR ALGEBRA SOFTWARE FOR MULTICORE ARCHITECTURES (PLASMA) PROJECT aims to address the critical and highly disruptive situation that is facing the Linear Algebra and High Performance Computing community due to the introduction of multicore architectures. PLASMA's ultimate goal is to create software frameworks that enable programmers to simplify the process of developing applications that can achieve both high performance and portability across a range of new architectures. PLASMA uses a programming model that allows asynchronous, out-of-order scheduling of operations in order to achieve a scalable yet highly efficient software framework for Computational Linear Algebra applications.

TILE ALGORITHMS

Unlike LAPACK, which uses block algorithms, PLASMA relies on tile algorithms to enable the use of fine grained parallelism.

LAPACK
Block algorithms

PLASMA
Tile algorithms

Tile algorithms of Linear Algebra operations can be represented as Directed Acyclic Graphs (DAG) where nodes represent the tasks to which the operation can be decomposed and the edges

PLASMA 2.1.0

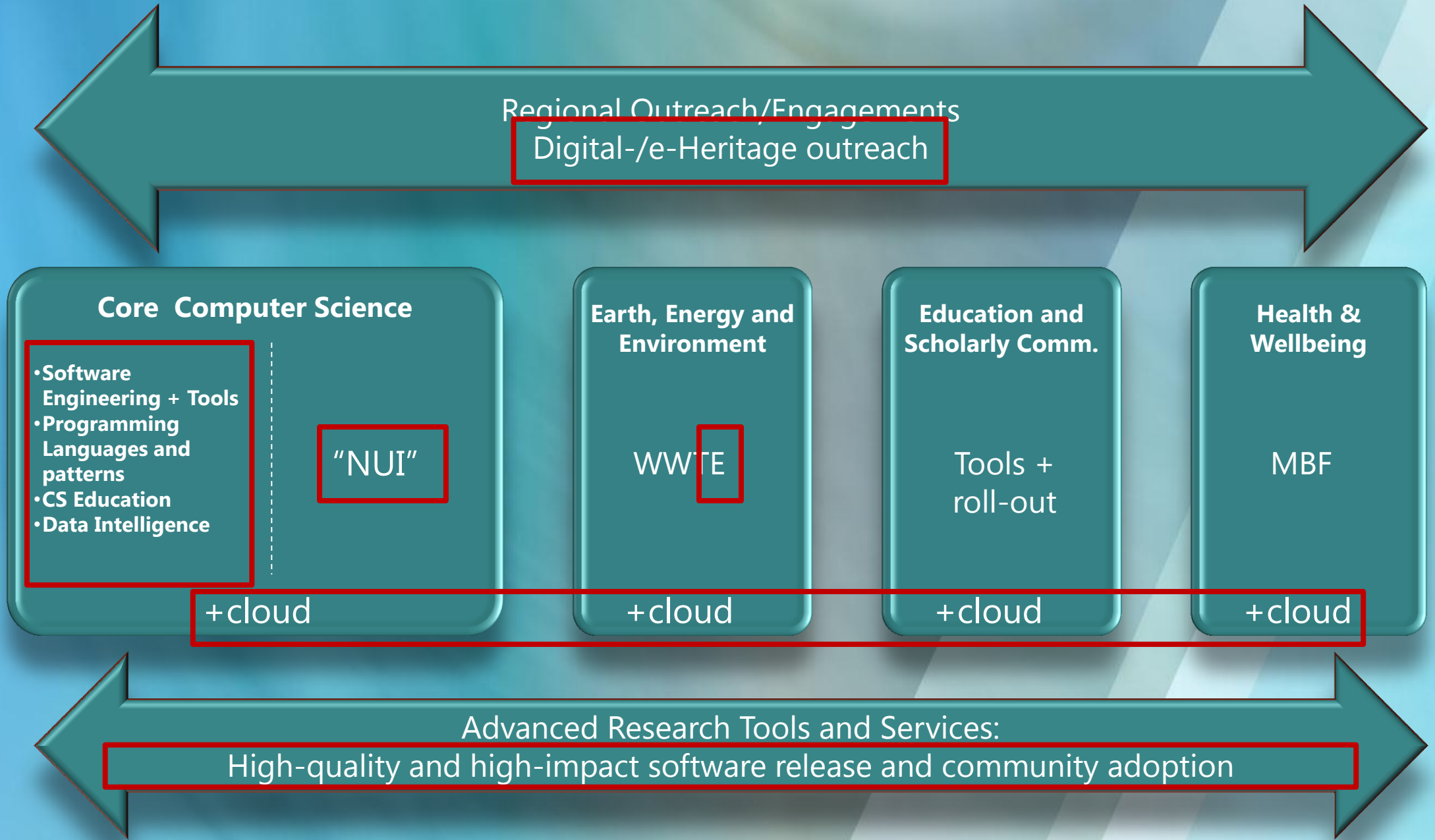
- Solution of Linear Equations
- Linear Least Squares Problems
- Multiple Precision Support
- Mixed-Precision Iterative Solver
- Static Scheduling
- LAPACK Interface / Native Interface
- LAPACK-Compliant Error Handling
- LAPACK-Derived Testing Suite
- Thread Safety
- Windows, Linux, AIX, Mac OS
- PLASMA Users' Guide

CURRENT RESEARCH

- Singular Value Decomposition

 New/changed

Focal areas



Focal areas

Regional Outreach/Engagements
Digital-/e-Heritage outreach

LATAM: **Jaime Puente**

Judith Bishop
Core Computer Science

- Software Engineering + Tools
- Programming Languages and patterns
- CS Education
- Data Intelligence

Kris Tolle
"NUI"

+cloud

Dan Fay
Earth, Energy and Environment

WWTE

+cloud

Lee Dirks
Education and Scholarly Comm.

Tools + roll-out

+cloud

Simon Mercer
Health & Wellbeing

MBF

+cloud

Derick Campbell

Advanced Research Tools and Services:
High-quality and high-impact software release and community adoption

“NUI”?

Overview

- External Research: vision/mission
- Focal areas for Microsoft Research's external engagements
note: not an exhaustive summary

- Anatomy of a good project

- How to engage with MSR

Anatomy of a good project:

- Aligns with our strategic themes
- Is 'anchored on' a Microsoft Researcher and is part of a genuine collaboration
- Builds upon Microsoft products and/or Research tools
- Innovates in a particular domain
- Has opportunity for broad influence/adoption
- Involves open source or, at least, interoperates with other technologies in the domain
- Has social impact ('improve lives around the world')
- Provides a good story/demo



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OK,...but how do I get involved?

research.microsoft.com/collaboration

Home | Our Research | **Collaboration** | Careers

About External Research | Tools and Services | Opportunities

Home > [Collaboration](#) > About External Research

About External Research

Fostering collaboration worldwide among academia, industry, and governments

Latin American Faculty Summit 2010



The sixth annual Latin American Faculty Summit unites academic leaders and representatives from multilateral and governmental organizations to share ideas and forge opportunities for creative innovation through research and development. The event, held May 12–14 in Guarujá, Brazil, is organized in collaboration with São Paulo Research Foundation. [Learn more...](#)

The [External Research](#) group builds partnerships worldwide to advance the research research process and its role in innovation. Find projects below by theme or by geographical region, and learn more about supported tools, services, teaching programs, and collaborative institutes.

A vision for the future:



*The Fourth Paradigm:
Data-Intensive
Scientific Discovery*

[Get your free copy >](#)

Also available in Kindle and paperback versions

What's New?

- [Bing Collaboration: Mapping the Future](#)
- [Research Focus in U.K., Silicon Valley](#)
- [Microsoft Builds Open-Source Tool](#)

What will I find there?

- Request for Proposal (RFP) announcements
- Competitions/awards
- Fellowship opportunities
- Access to and previews of our software releases
- Access to research data/services
- Information on our portfolio
- Events
- Links to our existing projects and collaborators





Microsoft Research Software Engineering Innovation Foundation (SEIF) Awards

Request for Proposals

Microsoft Research will shortly be accepting proposals for research grants in seminal software engineering areas, innovative software engineering education methods, and improvements in the software-development process. Microsoft Research anticipates making approximately twelve awards of about US\$15,000 to US\$25,000 each. Awards are made for the purpose of seed-funding larger initiatives, proofs of concept, or demonstrations of feasibility.

Proposals must be written in English and submitted through the [online application tool](#). Please read the following award details before you submit your application.

On This Page

- [Schedule and Deadlines](#)
- [Overview](#)
- [Goals and Objectives](#)
- [Resources](#)
- [Monetary Awards](#)
- [Eligibility](#)
- [Submission Process](#)
- [Selection Process and Criteria](#)

Submit

[Submit your proposal](#)

Related Links

- [Research in Software Engineering](#)
- [Computer Science Home](#)
- [Computer Science Papers and Presentations](#)
- [Collaboration and Funding Opportunities](#)

Contact Us

If you have questions related to this RFP, please send an e-mail message to seif@microsoft.com.



Software Engineering Innovation Foundation Awards

We are pleased to announce the recipients of the Microsoft Research Software Engineering Innovation Foundation (SEIF) Awards 2010. We received 85 proposals for research grants in seminal software engineering areas, innovative software engineering education methods, and improvements in the software development process. After a thorough internal review process, 12 proposals were selected to receive awards for the period June 2010 to May 2011. The SEIF Award recipients are listed below.

Name	Title	Institution
Diego Garbervetsky	Resource Usage Contracts for .NET	Universidad de Buenos Aires, Argentina
Sebastian Uchitel	Strengthening Code Contracts with Typestates	Universidad de Buenos Aires, Argentina
Karin Breitman	Cloud-Based Software Engineering: Weaving Elasticity into Early Design	PUC do Rio de Janeiro, Brazil
Gail Murphy	Automatically Finding Help for Framework Usage	University of British Columbia, Vancouver, Canada
Sunghun Kim	Detecting and Fixing Bugs as they are Created in Visual Studio	The Hong Kong University of Science and Technology, China
Pankaj Jalote	An Integrated Approach for Software Engineering Projects using Visual Studio	IIIT-Delhi, India

Related Links

- [Research in Software Engineering](#)
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Multi-word Tag Cloud from Government Dataset Titles (from Tony's talk)

Single Tag Cloud



Multi Tag Cloud



Ref: Dr. Li Ding, Rensselaer Polytechnic Institute

Microsoft Web N-gram Services


Access *petabytes of data* via the Web N-gram services (Public Beta).

We invite the whole community to use the Web N-gram services, made available via a cloud-based platform, to drive discovery and innovation in web search, natural language processing, speech, and related areas by conducting research on real-world web-scale data, taking advantage of regular data updates for projects that benefit from dynamic data.

The Web N-gram services provide you access to:

- Content types: Document Body, Document Title, Anchor Texts
- Model types: Smoothed models
- N-gram availability: unigram, bigram, trigram, N-gram with N=4, 5.
- Training size (Body): *All* documents indexed by Bing
- Access: Hosted Services by Microsoft
- Updates: Periodical updates

Late last year, we introduced a private beta testing of the Web N-gram Services. We are now expanding access in the [Public Beta Web N-gram Services](#) to include professors and students at accredited colleges and universities worldwide.

 Web N-gram is brought to you by Microsoft Research in partnership with Microsoft Bing.

Featured Demos

- [Multi-word Tag Cloud from Government Dataset Titles](#)

Announcements

- [SIGIR Web N-gram Workshop \(Call for Papers\)](#)
July 23, 2010 – Geneva, Switzerland
Submission deadline: June 11, 2010
- [Web N-gram Services on Azure with NSF Computing in the Cloud Program Solicitation](#)
Letter of Intent April 30, 2010

Papers

- [Exploring Web Scale Language Models for Search Query Processing](#), WWW 2010
- [An Overview of Microsoft Web N-gram Corpus and Applications](#), NAACL-HLT 2010

[Learn More](#)

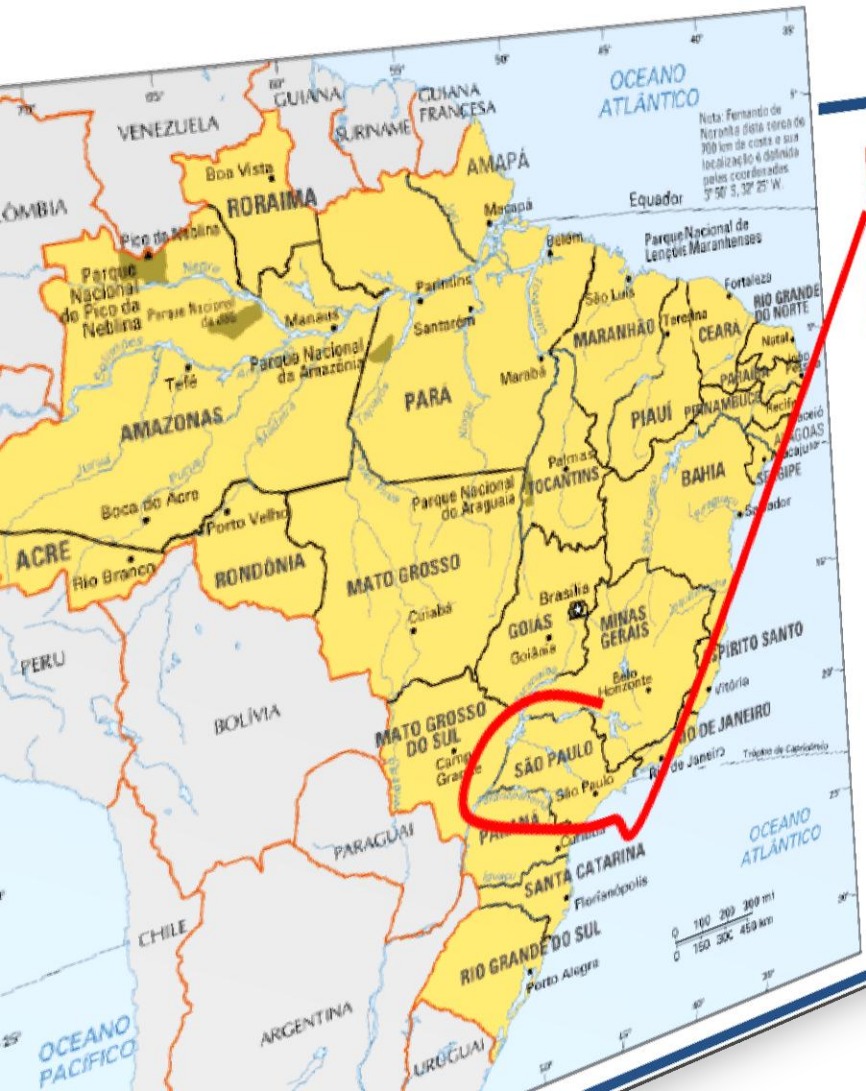
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MSR-FAPESP Virtual Institute for IT RESEARCH

State of São Paulo, Brasil



34% of Brazil's GNP
40 Million people
52% of Brazilian science
13% of State budget to HE
and R&D
1,5% GNP for R&D

3 State Universities
19 Tech Faculties
45% of the PhDs formed in
Brazil (4,500 in 2008)
19 State Research
Institutes
1 Research Foundation
65% of R&D public support
comes from State sources

The Microsoft Research-FAPESP Virtual Institute for IT Research supports high-quality fundamental research in information and communication technologies that relates to social and economic development challenges in the region:

- Collaboration from December 2006
- 3 Calls for Proposals published
- 11 research projects in execution
- Research workshops held annually
- Overall joint investment for the Institute US\$2M

Latin American and Caribbean Collaborative ICT Research Federation

Hub Universities:

- Pontificia Universidad Católica de Chile; Universidad de Chile

Spoke Universities:

- Tecnológico de Monterrey, Mexico; Instituto Politécnico Nacional, Mexico; Universidad de la República, Uruguay; Universidad de Buenos Aires, Argentina; University of the West Indies, Trinidad & Tobago; Universidad de los Andes, Colombia; Universidad de Costa Rica

3 year summary:

- 400 researchers from 80 institutions in 19 countries connected to the LACCIR network
- 170 world class expert researchers evaluate research proposals.
- 15 regionally international collaborative research projects funded by LACCIR .
- 50 international publications
- 18 graduate students have visited other Latin American countries for a research stay, connecting 13 countries



www.laccir.org



Thursday, May 13, 2010

...: Home ...

Home

About Us

Activities & Highlights

Research Map

Keynote Speeches

LAC Journals

News

RFP Request for Proposals

Short Stays Program

MSR-LA Int. & Fellowships

Technical Committee

Research Projects

Associated Initiatives

LAC Research Observatory

Research Teams

Video Conference

Contact Us

Workspaces

LACCIR Request for Proposals 2010

LACCIR RFP 2010 focuses on the areas of **Healthcare, Education, Energy and Earth, Environment & Climate Change**.

Total amount available **US\$300,000**. LACCIR anticipates funding up to 6 proposals.

Estimated Schedule and Deadlines for LACCIR 2010 research proposals

First date for submission of proposals:	June 2010
Last date for submission of proposals:	September 2010
Notification of Awards:	December 2010

LACCIR Short Stays Program 2010

Support the completion of Post Graduate dissertations in Computer Science developed in the Latin American and Caribbean region by partially financing useful research stays in other research centers in the region. [Keep Reading](#)

Schedule and Deadlines for LACCIR 2010 Short Stays Program

First date for submission of proposals:	May 17 th 2010
Last date for submission of proposals:	August 30 th 2010
Notification of Awards:	October 30 th 2010

What **won't** I get from there?

- A guarantee of \$s



What **won't** I get from there?

- A guarantee of collaboration



OK, beyond surfing the web, how do I get involved?

- Exploit our existing tools/technologies/services
- Give feedback and/or make extensions
- Look at which Microsoft Researchers are active in your field...
...go where they go (conferences/events)
- Talk to some of our existing collaborators
- Talk to Jaime and/or the Theme lead
- Respond to the RFPs/calls
- Offer students for internships
- Submit proposals into LACCIR/FAPESP virtual institute calls
- As a last resort direct proposals (usually best as short 'concept descriptions')

Reminder...

research.microsoft.com/collaboration

Thank you