Brazilian Computer Society (SBC) and Graduate Programs in Computer Science

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MCT and CNPQ and FAPs– A Few Lines of Action

- Human Resources for Science, Technology & Innovation
- Support for Technological Innovation on Companies
- Technological Services
- Information and Communication Technologies
- Health and Biotechnology
- Nanotechnology
- Oil, Gas, Biofuels and Energy
- Space Program
- Nuclear Program
- Agriculture and Cattle Raising Development
- Natural Resources and Biodiversity
- Sea and Antarctica
- Sustainable Development of the Amazon and Semi-Arid Region
- Meteorology and Climate Changes
- Social Development Technologies
Agenda

- Introduction
  - Universidade de São Paulo (USP)
    - ICMC/USP – São Carlos
- Brazilian Computer Society (SBC) – [www.sbc.org.br](http://www.sbc.org.br)
  - Organization and Main Activities
  - Grand Challenges: Brazil and South America
- Computer Science Graduate Programs
  - Distribution of Programs
  - Distribution of Human Resources: Advisors and Students
- INCTs – Science and Technology National Institutes
Universidade de São Paulo (USP)

- Among the best universities in the world
- Around 100,000 students and 6,000 professors
Brazilian Computer Society
Brazilian Computer Society (SBC)

- Established in 1978
  - The largest computer society in Latin America
  - A scientific organization dedicated to the advancement of C. S.
  - Leading forum for researchers, students and computing professionals
  - Structurally organized as a Board of Directors and 21 Regional Chapters
  - The research activities are fostered by 24 Special Interest Groups
    - Sponsors over 40 and supports over 60 events/year
    - More than 40,000 participants
  - Brazilian Olympiad in Informatics (OBI), ACM Marathon and Imagine Cup (Microsoft)
  - National Graduate Program Admission Exam (POSCOMP)
  - JBCS (SBC) and JISA (SBC, CGI.BR and LARC) (Scielo; Springer)
SBC Regional Chapters (and Institutional Representatives)

- **Centro-Oeste** (5)
- **Nordeste 1** (6)
- **Nordeste 2** (9)
- **Norte 1** (6)
- **Norte 2** (7)
- **Norte 3** (4)
- **Bahia** (15)
- **Ceará** (6)
- **Espírito Santo** (8)
- **Mato-Grosso** (7)
- **Mato-Grosso do Sul** (7)
- **Minas Gerais** (31)
- **Paraíba** (6)
- **Paraná** (18)
- **Pernambuco** (4)
- **Rio de Janeiro** (16)
- **Rio Grande do Norte** (7)
- **Rio Grande do Sul** (28)
- **Santa Catarina** (15)
- **São Paulo Leste** (14)
- **São Paulo Oeste** (17)
OBI – Brazilian Olympiad in Informatics

Winners 2005 – 2009
SBC
Grand Challenges in Computer Science
What are Grand Challenges?

- Ambitious, visionary, feasible within a time frame – 10 years
- Social and Economic Impact
- Multidisciplinary both in nature & solution
- Scientific advances, beyond a typical grant
- Subject to clear and objective evaluation

Integrate abilities & competences in solutions to multidisciplinary, relevant, complex problems in Brazil and in Latin America.
Brazilian Computer Society (SBC)

  - Joint effort with the Brazilian Academy of Sciences (ABC) (www.abc.org.br)
  - Manaus 2009
- CharLa’08 - Grand Challenges in Computer Science Research in Latin America Workshop
  - 5-6 Sept 2008, Buenos Aires, Argentina
  - Joint effort with CLEI and LATAM
1. **Management of information** over massive volumes of distributed multimedia data

2. Computational modeling of **complex systems**: artificial, natural, socio-cultural and human-nature interactions

3. Impacts on Computer Science of the **transition from silicon to new technologies**

4. **Participative and universal** access to knowledge for the **Brazilian** citizen

5. Technological development of quality: dependable, scalable and ubiquitous systems (**omnivalence**)
Microsoft Research
Faculty Summit 2010
Guarujá, Brasil | May 12 - 14 | In collaboration with FAPESP

Grand Challenges in Computer Science
Research in Latin America Workshop

CharLa '08
Microsoft Research

Faculty Summit 2010

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CharLa'08

Organizers

SBC
Sociedade Brasileira de Computação

CLEI
Centro Latinoamericano de Estudios en Informática

LACIR

Supporters

SADT
Sociedad Argentina de Informática

SOCIEDAD CHILENA DE CIENCIA DE LA COMPUTACIÓN

SMCC
SOCIEDAD PERUANA DE COMPUTACIÓN
Latin American Grand Challenges in Computer Science

CharLa 08

- Call for Proposals
- Paper selection
- 20 researchers invited + PC
- Paper presentation
- Working groups
- Definition of 4 Grand Challenges

Previous Initiatives
- Brazil
- UK
- USA

- MSR Academic Summit
  Panama, May 2008

Technical Report
Dissemination & Evolution
Portal
Research Initiatives …
1. Citizen-oriented Information & Communication Technologies
   • Tecnologias de la Informacion y la Comunicacion orientadas al ciudadano
   • Tecnologias de Informação e Comunicação Orientadas ao Cidadão

2. Multilingualism & Latin American Identity in a Digital World
   • Multilinguismo e Identidad Latinoamericana en un Mundo Digital
   • Multilinguismo e Identidade Latinoamericana em um Mundo Digital

3. Computing for environmental monitoring and control
   • Computacion para monitoreo y control ambiental
   • Computação orientada ao monitoramento e controle ambiental

4. Complex Collaborative Networks (in Latin America)
   • Redes Colaborativas Complejas (en America Latina)
   • Redes Colaborativas Complexas (na América Latina)
1. Citizen-oriented Information & Communication Technologies
   • Development and use of models & technologies (web, telephony, radio, tv, ...) for supporting citizen-oriented activities towards knowledge dissemination and citizen empowerment

2. Multilingualism & Latin American Identity in a Digital World
   • Preservation of Latin American language and cultural heritage, towards digital inclusion and universal access to LA citizens

3. Computing for environmental monitoring and control
   • Creation and application of computing and communication models & infrastructure for gathering, controlling and disseminating relevant environment information

4. Complex Collaborative Networks (in Latin America)
   • Development of a collaborative network for sharing experiences, infrastructure, knowledge, and efforts towards complex problems solutions
3. **Computing for environmental monitoring and control**

- Creation and application of computing and communication models & infrastructure for gathering, controlling and disseminating relevant environment information
- **Potential applications**
  - Monitoring of environmental conditions
  - Management of disasters and development of forecast models
  - Increasing productivity (food production, agribusiness)
  - Energy-aware systems
- **Research questions**
  - Theories & techniques for WSN cross-layer design
  - Modeling of the systems
  - Integration of various input data sources (e.g., field, satellite)
  - Data analyses
3. Computing for environmental monitoring and control

Probably the best biological sensors to detect early environment problems

Scientific Challenges:

• Theory
• Techniques
• Methodologies
• Tools
• Processes
Perspectives

• Latin American Grand Challenges
  • Dissemination & Evolution Process
  • Latin American funding agencies initiatives

• Grand Challenges Related Initiatives
  • FAPESP & MICROSOFT Research – 2007, 2008, 2009 – (5, 2, 4 projects)
    • www.fapesp.br/en/materia/5392/agreements/fapesp-microsoft-research-agreement.htm
  • CNPq/CT-INFO nº 07/2007
  • MCT & SBC & BRASSCOM (http://www.brasscom.org.br/)
Number of Graduate Programs in Some Fields

- Computing: 45 MSc., 21 DSc.
- Physics: 50 MSc., 35 DSc.
- Math: 38 MSc., 23 DSc.
- Chemistry: 54 MSc., 35 DSc.
- Electrical Eng.: 53 MSc., 28 DSc.

2010
Master Programs – Distribution by Region

North

Northeast

Middle West

South

- Computer
- Physics
- Math
- Chemistry
- Electrical Eng.

2010
C. S. Programs – Distribution by Region

- **North**
  - Master: 2
  - PhD: 1

- **Middle West**
  - Master: 3
  - PhD: 2

- **Southeast**
  - Master: 10
  - PhD: 5

- **South**
  - Master: 11
  - PhD: 4

Region: Brazil

Year: 2010
C. S. Programs – Distribution by State

Master

PhD
C. S. Master Programs – Distribution by Region

North: 5%
Northeast: 22%
Middle West: 7%
Southeast: 42%
South: 24%
C. S. PhD Programs – Distribution by Region

- **North**: 5%
- **Northeast**: 24%
- **Middle West**: 9%
- **Southeast**: 43%
- **South**: 19%

Map showing the distribution across different regions of Brazil for the year 2010.
C. S. Graduate Programs – International Insertion
C. S. Master Students – By Region/State

- North: 105
- Middle West: 106
- South: 613
- Northeast: 840
- Southeast: 1301

[Map of Brazil with data distribution by region and state, showing bars for 2006, 2007, and 2008.]
C. S. PhD Dissertation – By Region/State

- **North**
- **Middle West**
- **South**
- **Northeast**

Map showing the distribution of PhD dissertations by region and state in Brazil. The map highlights the states with the highest number of dissertations in the years 2004-2008:

- **Northeast** (22 dissertations)
- **Southeast** (99 dissertations)
- **South** (20 dissertations each)

Bar chart on the left shows the distribution of dissertations by year and state (SP and Brazil) with different colors representing years 2004-06, 2007, and 2008.
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MCT & CNPq & CAPES & FAPs: National Institutes of Science and Technology
INA_~T~s – National Institutes of Science and Technology

- A National Research Program with Ambitious and Extensive Goals:
  - To mobilize and aggregate, in an articulated way, the best research groups in frontier areas of science and strategical areas for the sustainable development of the country;
  - To push forward the basic, fundamental and internationally competitive scientific research;
  - To stimulate the development of cutting-edge scientific and technological research, associated with applications to promote innovation and enterprising spirit, in close articulation with innovative companies.

http://www.cnpq.br/programas/inct/_apresentacao/
INCTs – National Institutes of Science and Technology

• INCTs Coordinated by C. S. Researchers:
  • **Critical Embedded Systems**
    Prof. Dr. José Carlos Maldonado (USP)
  • **Web**
    Prof. Dr. Virgílio Almeida (UFMG)
  • **Micro and Nanoelectronical Systems**
    Prof. Dr. Jacobus Willibrordus Swart (UNICAMP)
  • **Scientific Computing-Assisted Medicine**
    Prof. Dr. Raúl A. Feijóo (LNCC-RJ)
  • **Web Science**
    Prof. Dr. Carlos J. P. de Lucena (PUC-RJ)
  • **Software Engineering**
    Prof. Dr. Silvio Meira (UFPE)
Thank you!