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

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

José Carlos Maldonado
Vice-Director of ICMC
President of SBC

ICMC/USP – São Carlos (jcmaldon@icmc.usp.br)

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
  - 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

Pirassununga

São Carlos

Bauru

Piracicaba

Lorena

São Paulo

Ribeirão Preto

EACH – São Paulo

ICMC/USP (São Carlos)

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Brazilian Computer Society

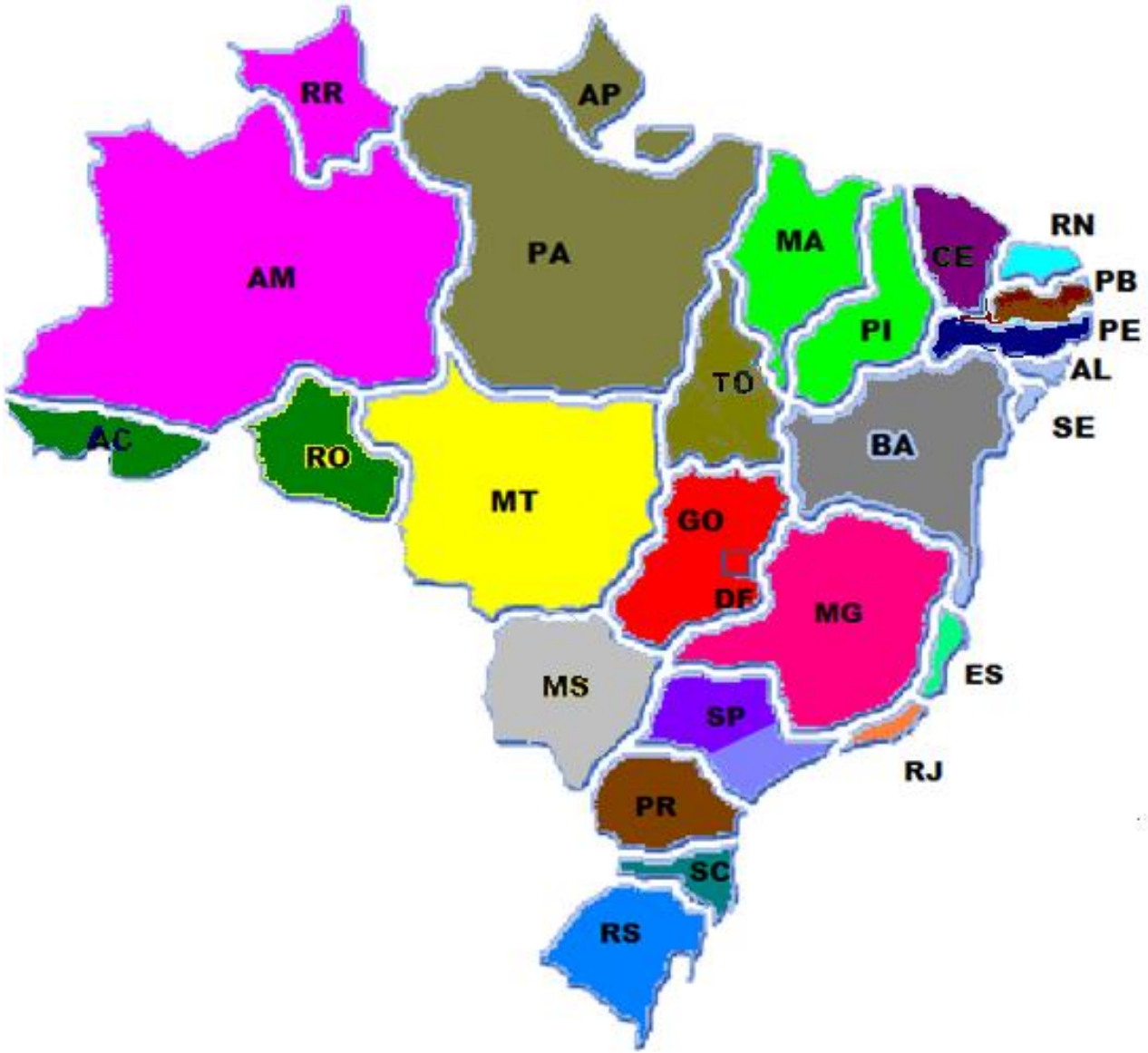
SBC

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)

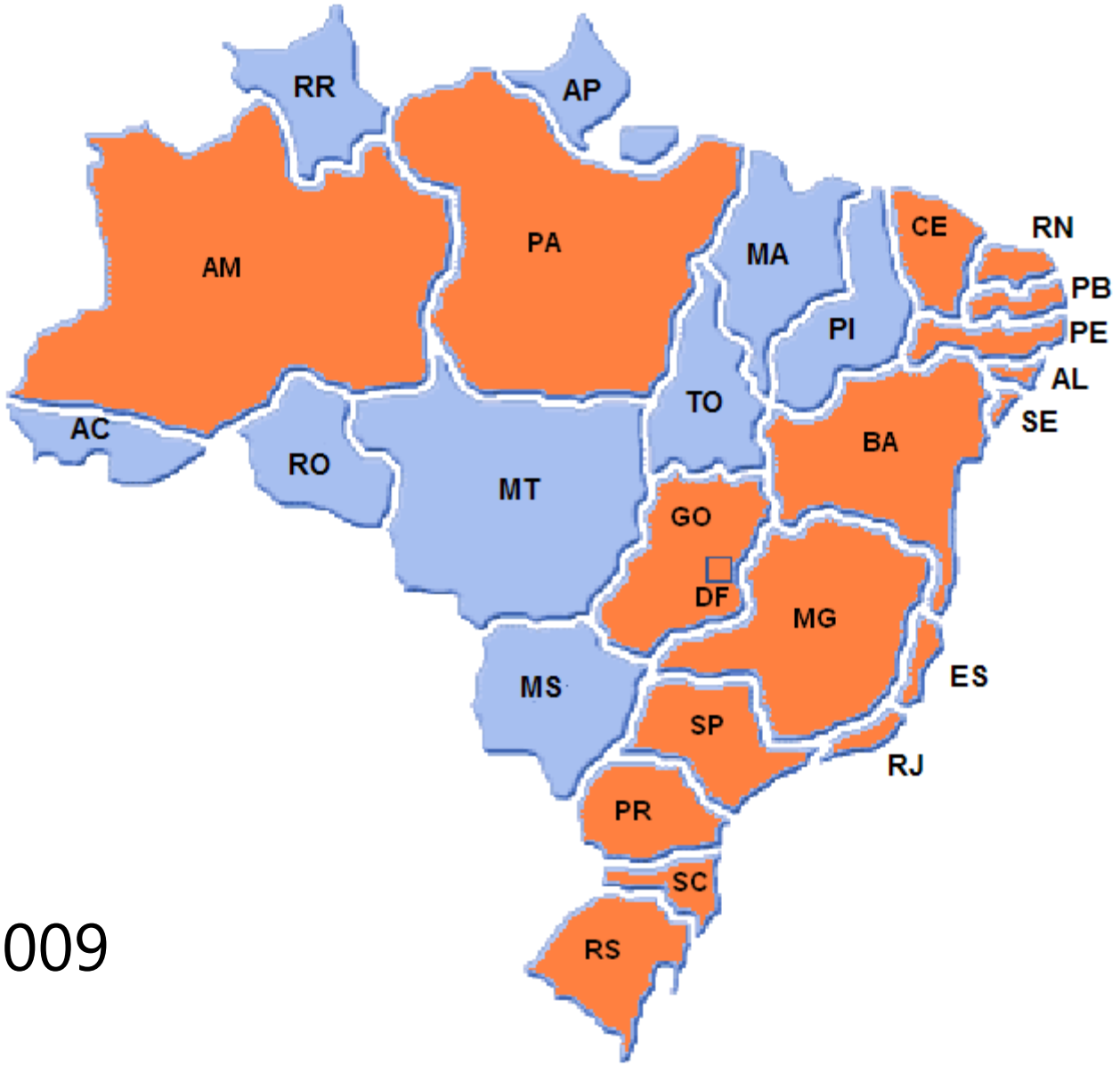
SBC Regional Chapters (and Institutional Representatives)

- 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

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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)

- Grand Research Challenges in C. S. (2006 – 2016)
  - 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

Grand Challenges 2006 – 2016, São Paulo, Brazil

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**)

www.sbc.org.br
CMBM

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Grand Challenges in Computer Science Research in Latin America Workshop

CharLa'08

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CharLa'08

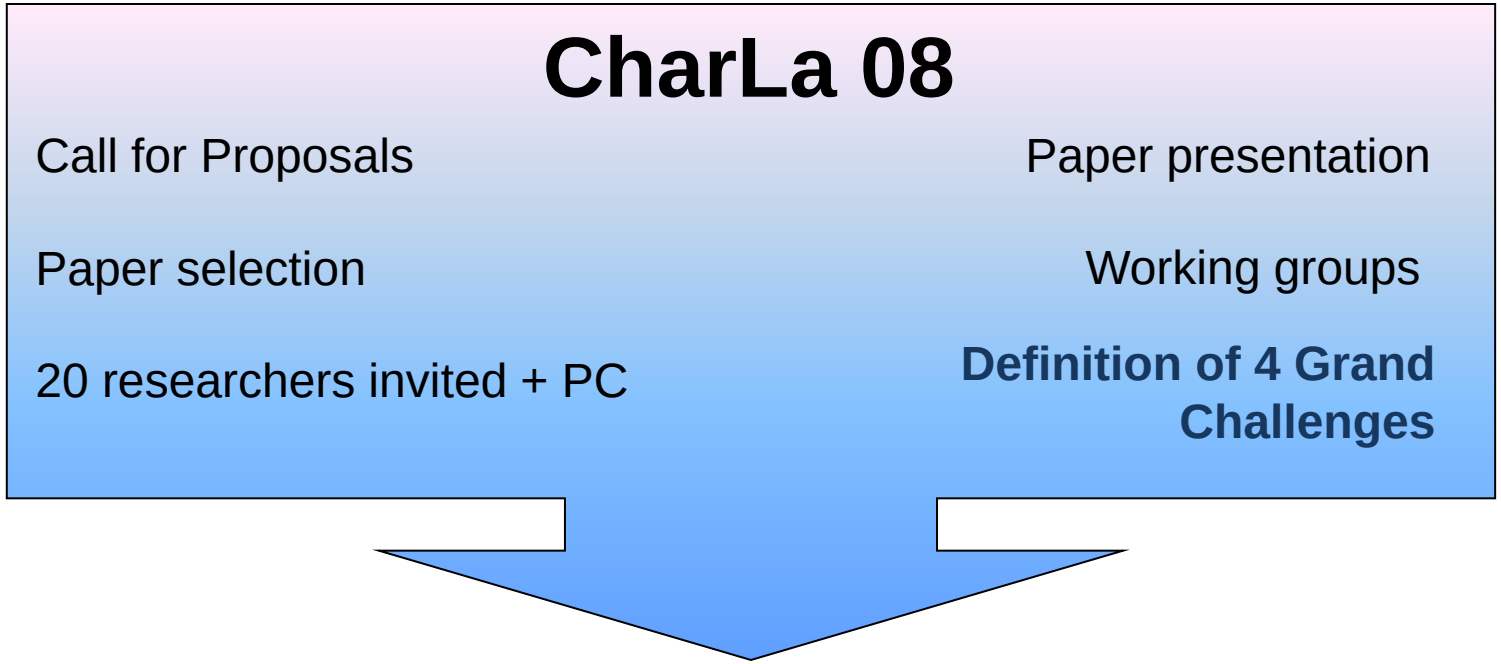
Organizers

Supporters

Latin American Grand Challenges in Computer Science

Previous Initiatives

Brazil
UK
USA



- Clei'08: LA CS Soc. Pres.

- MSR Academic Summit Panama, May 2008

Technical Report
Dissemination & Evolution
Portal
Research Initiatives …

Grand Latin American Challenges

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. **Multilinguism & 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)

Grand Latin American Challenges

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. **Multilinguism & 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

For Example

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

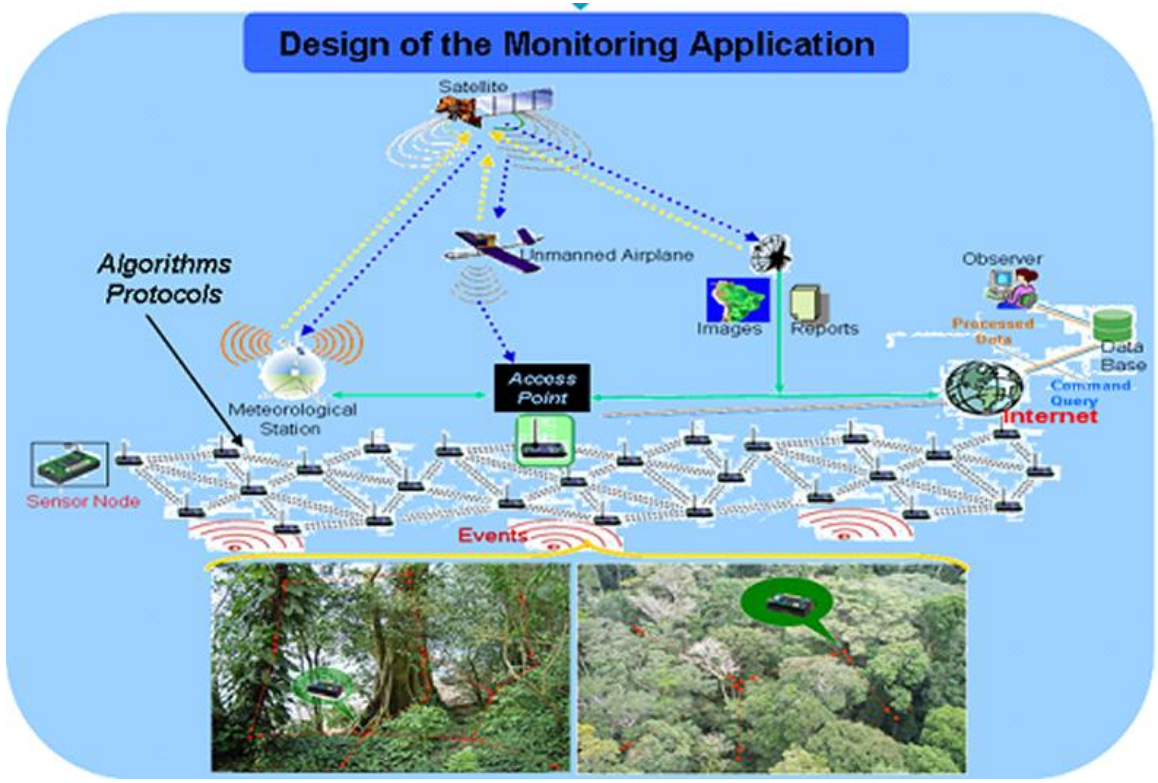
For Example

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
  - Portal (Complete Technical Report) – http://tortuga.lbd.dcc.ufmg.br/
  - 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
    - http://www.finep.gov.br/fundos_setoriais/ct_info/ct_info_ini.asp
  - MCT & SBC & BRASSCOM (http://www.brasscom.org.br/)

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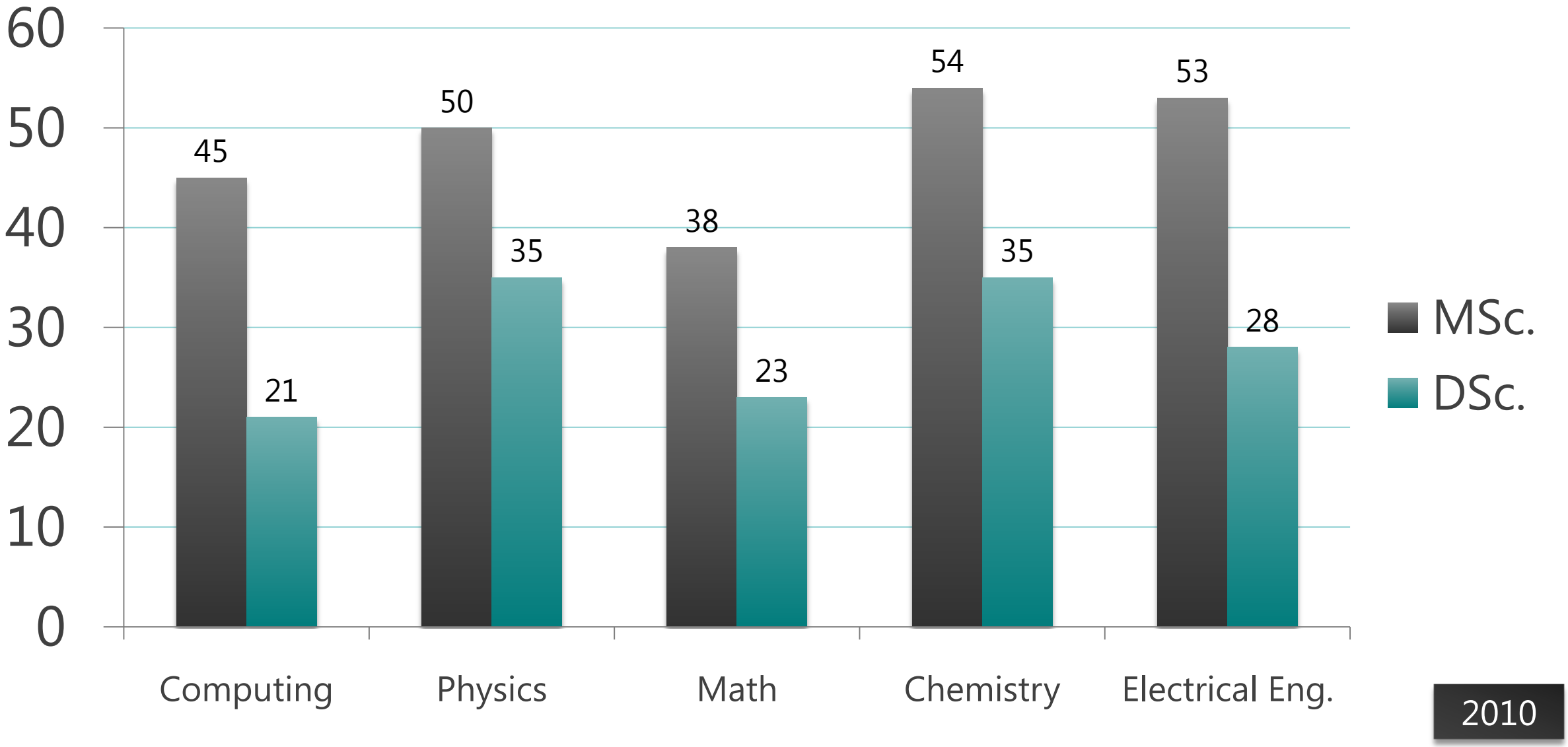
Computer Science Graduate Programs

CAPES (www.capes.gov.br)

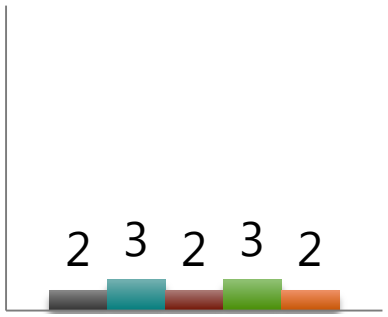
Brazil

Number of Graduate Programs in Some Fields

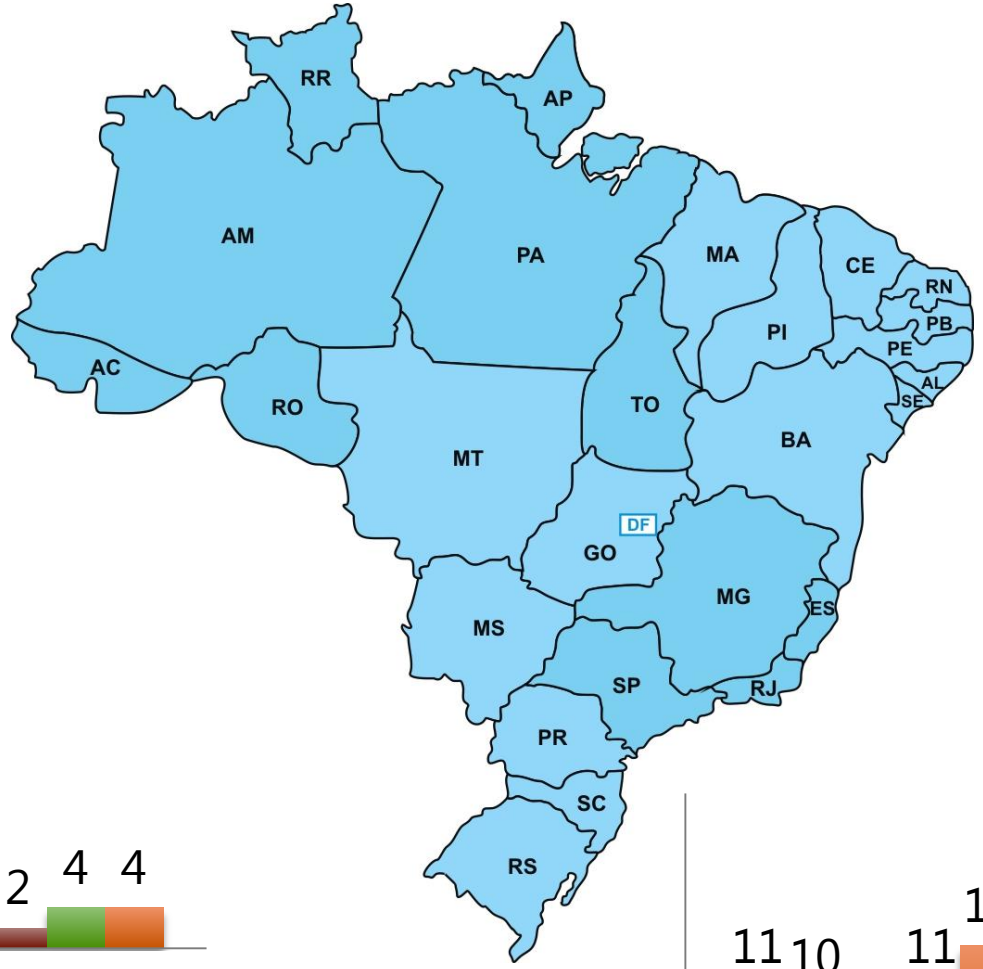


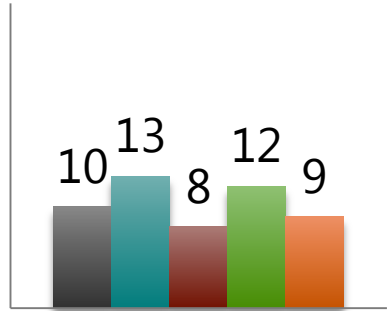
2010

Master Programs – Distribution by Region



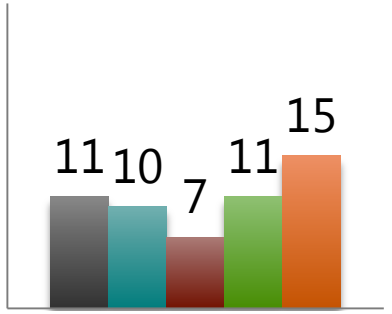
North



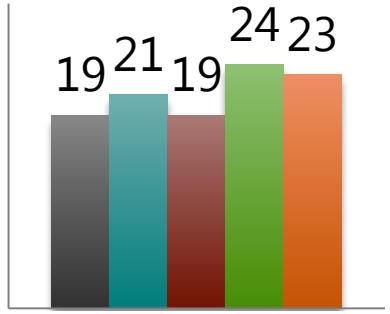


Northeast

Middle West



South

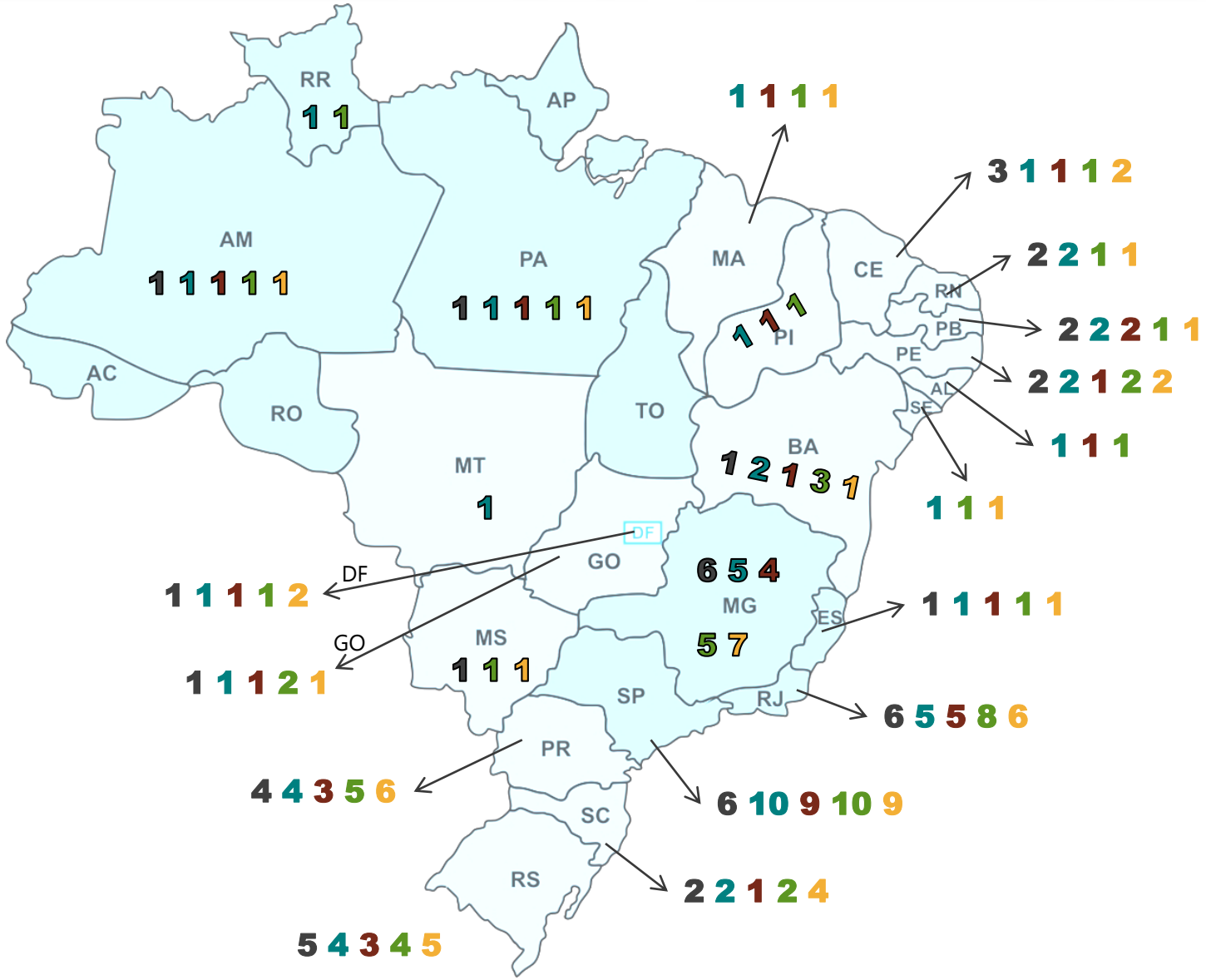


Southeast

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

2010

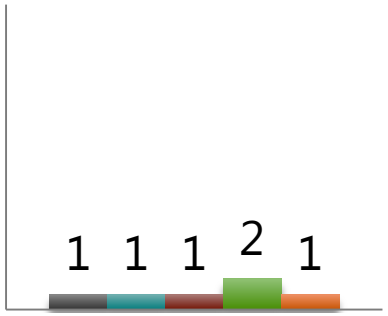
Master Programs – Distribution by State



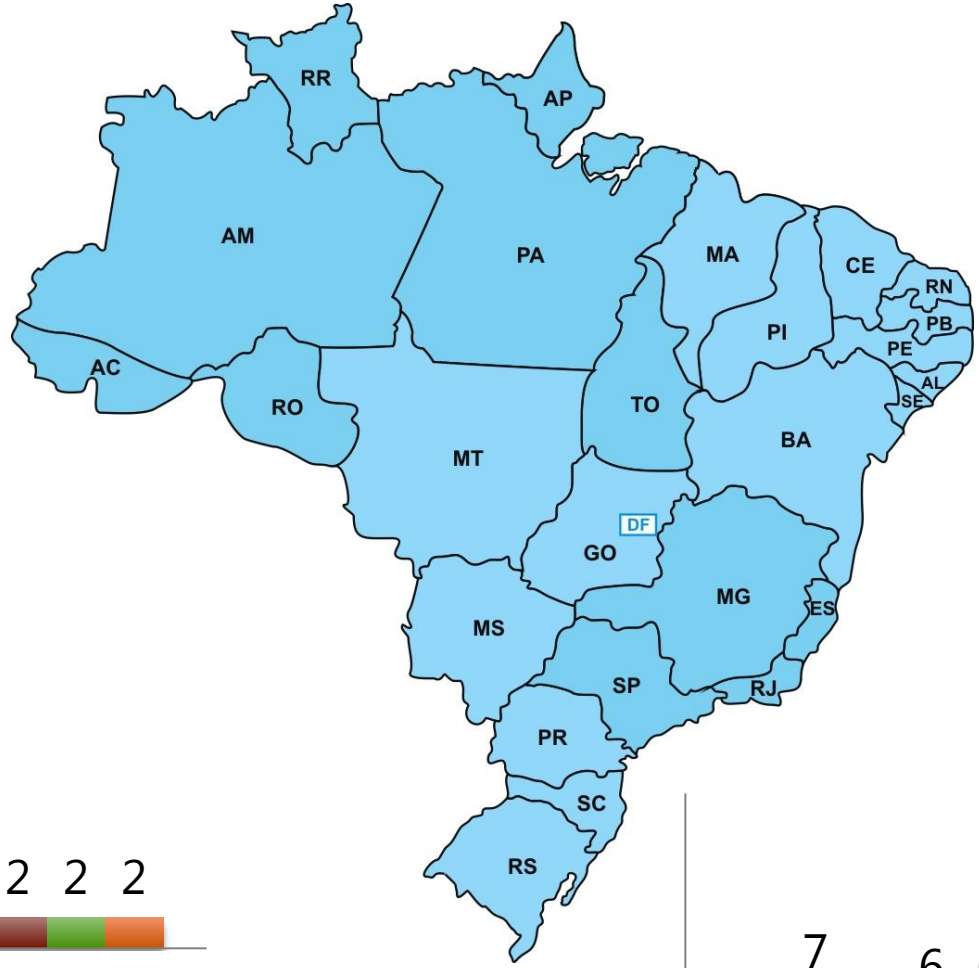
- Computer
- Physics
- Math
- Chemistry
- Electrical Eng.

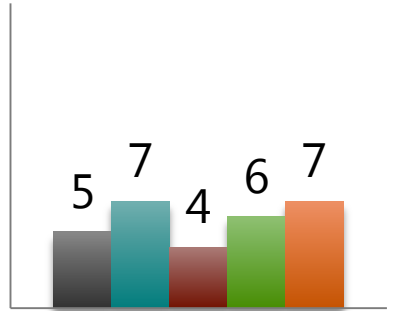
2010

PhD Programs - Distribution by Region

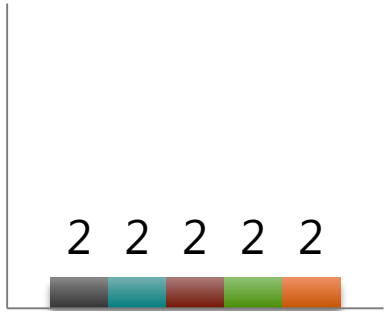


North

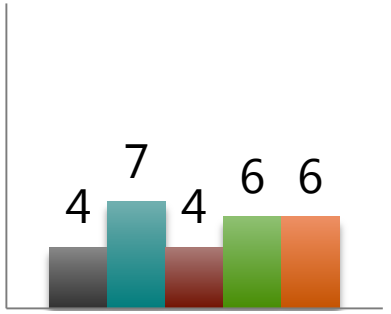




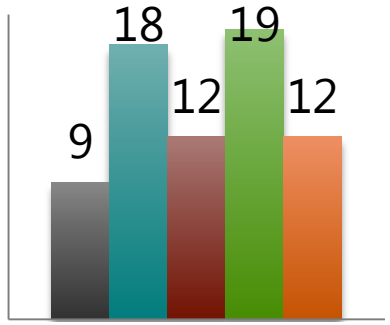
Northeast



Middle West



South

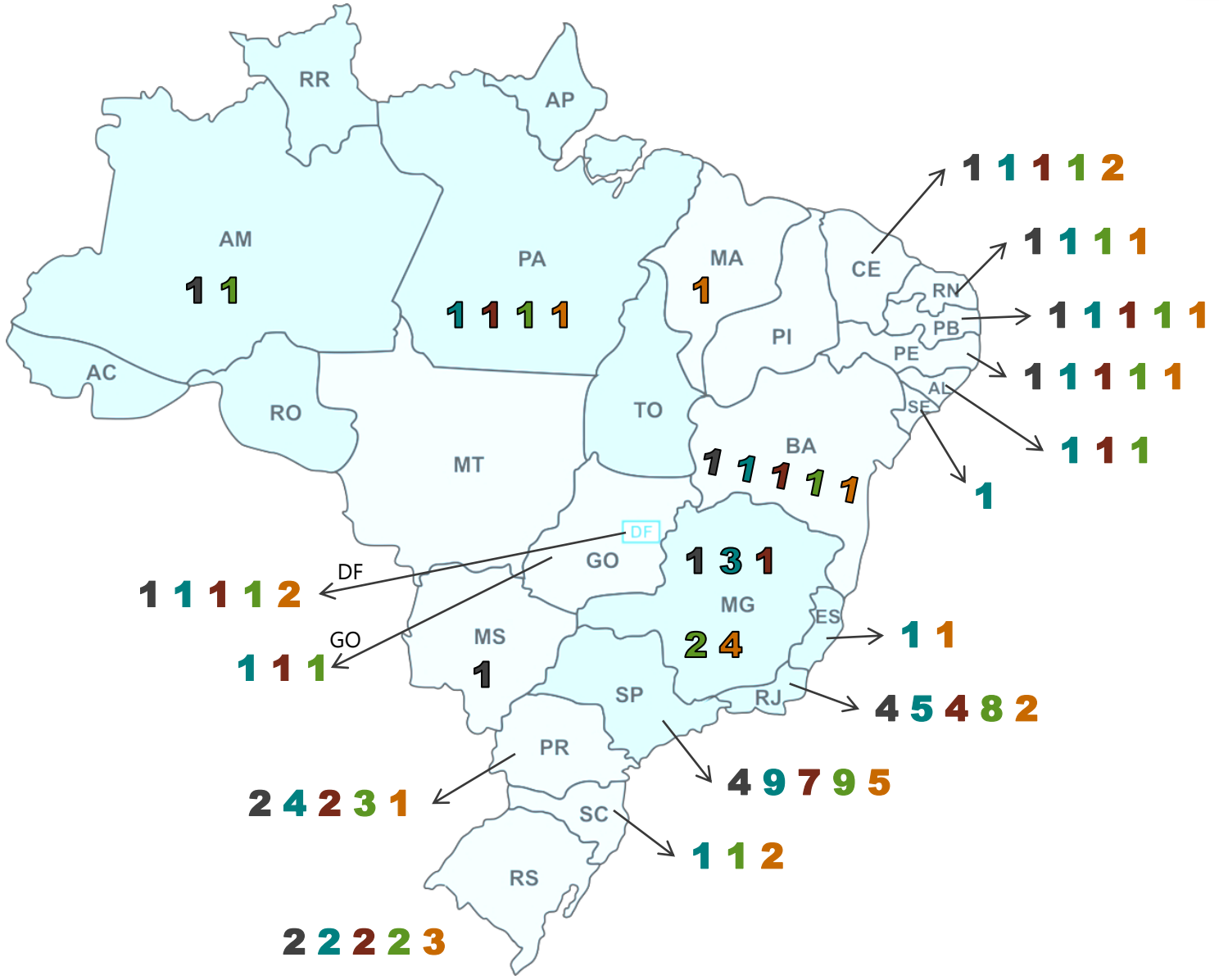


Southeast

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

2010

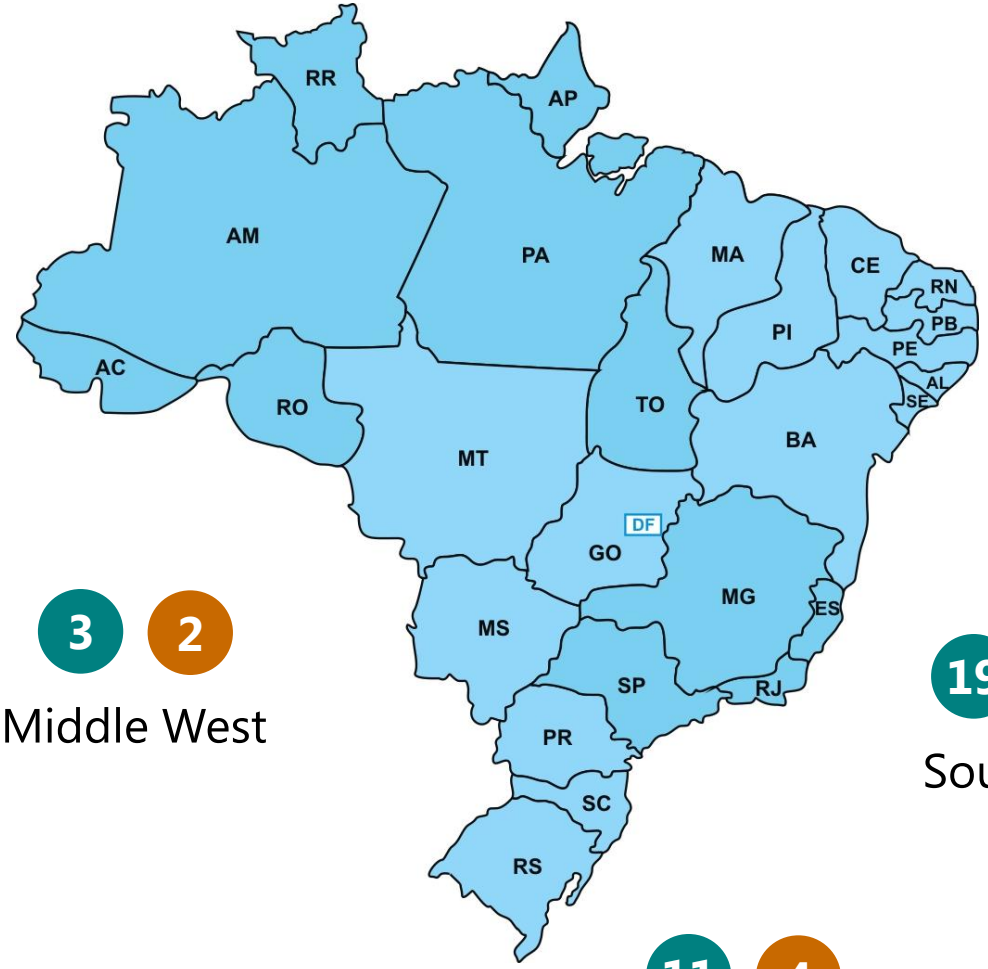
PhD Programs – Distribution by State



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

2010

C. S. Programs – Distribution by Region



North: 2 (Master) 1 (PhD)

Northeast: 10 (Master) 5 (PhD)

Middle West: 3 (Master) 2 (PhD)

Southeast: 19 (Master) 9 (PhD)

South: 11 (Master) 4 (PhD)

Master

PhD

2010

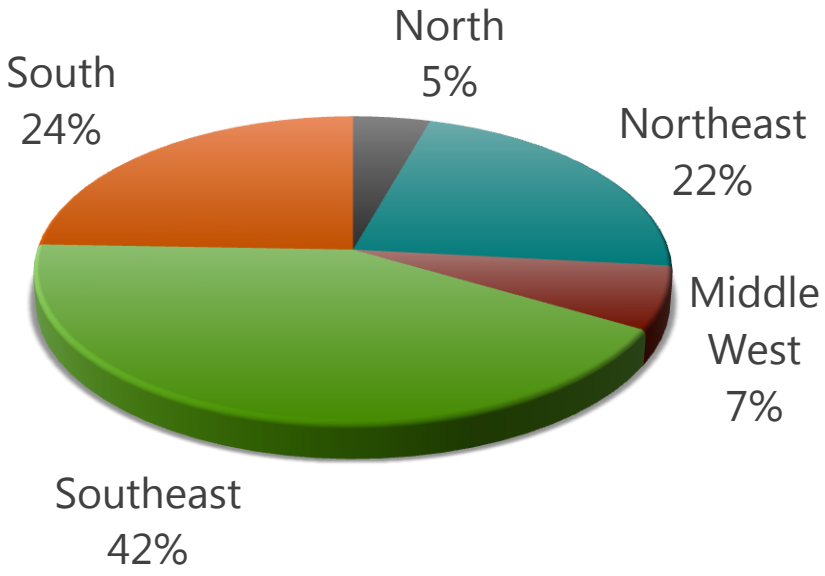
C. S. Programs – Distribution by State

Master

PhD

2010

C. S. Master Programs – Distribution by Region



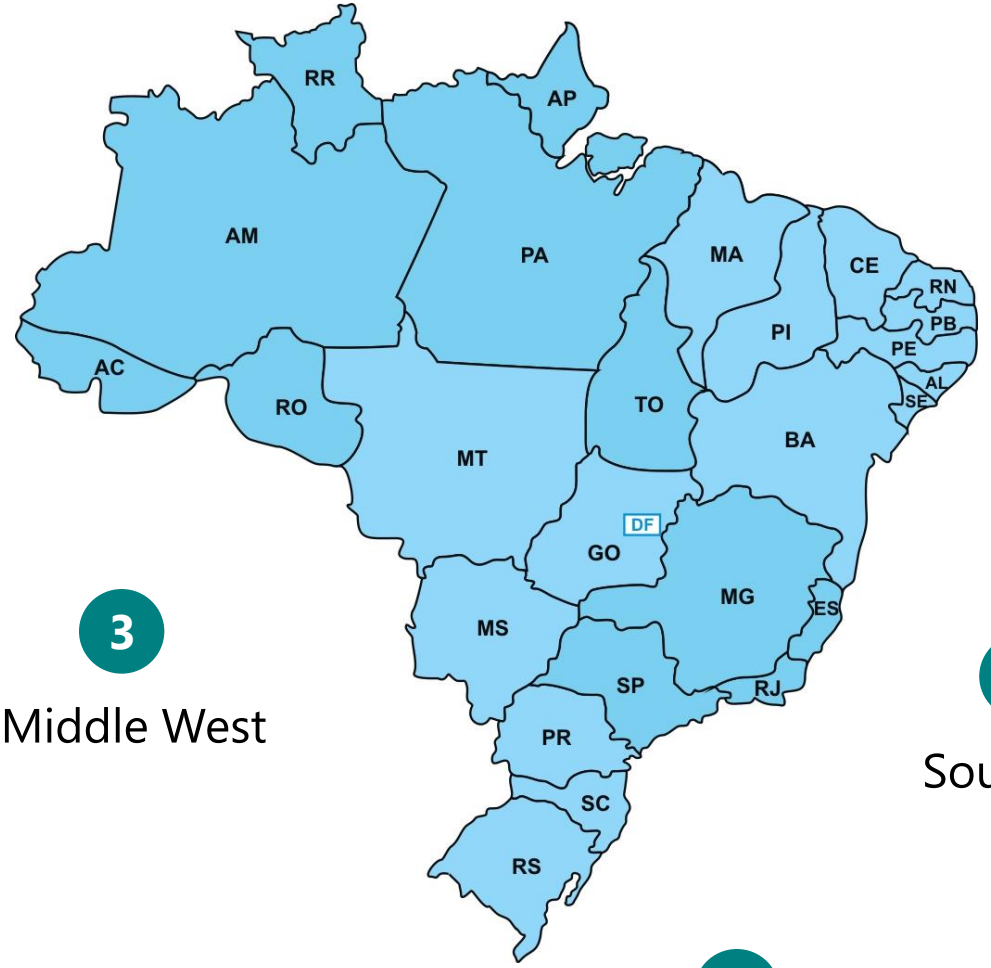
2
North

10
Northeast

3
Middle West

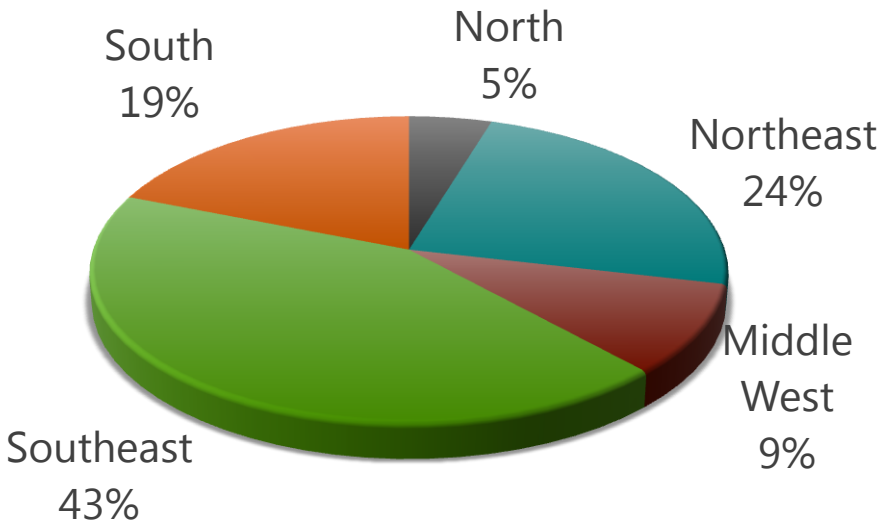
19
Southeast

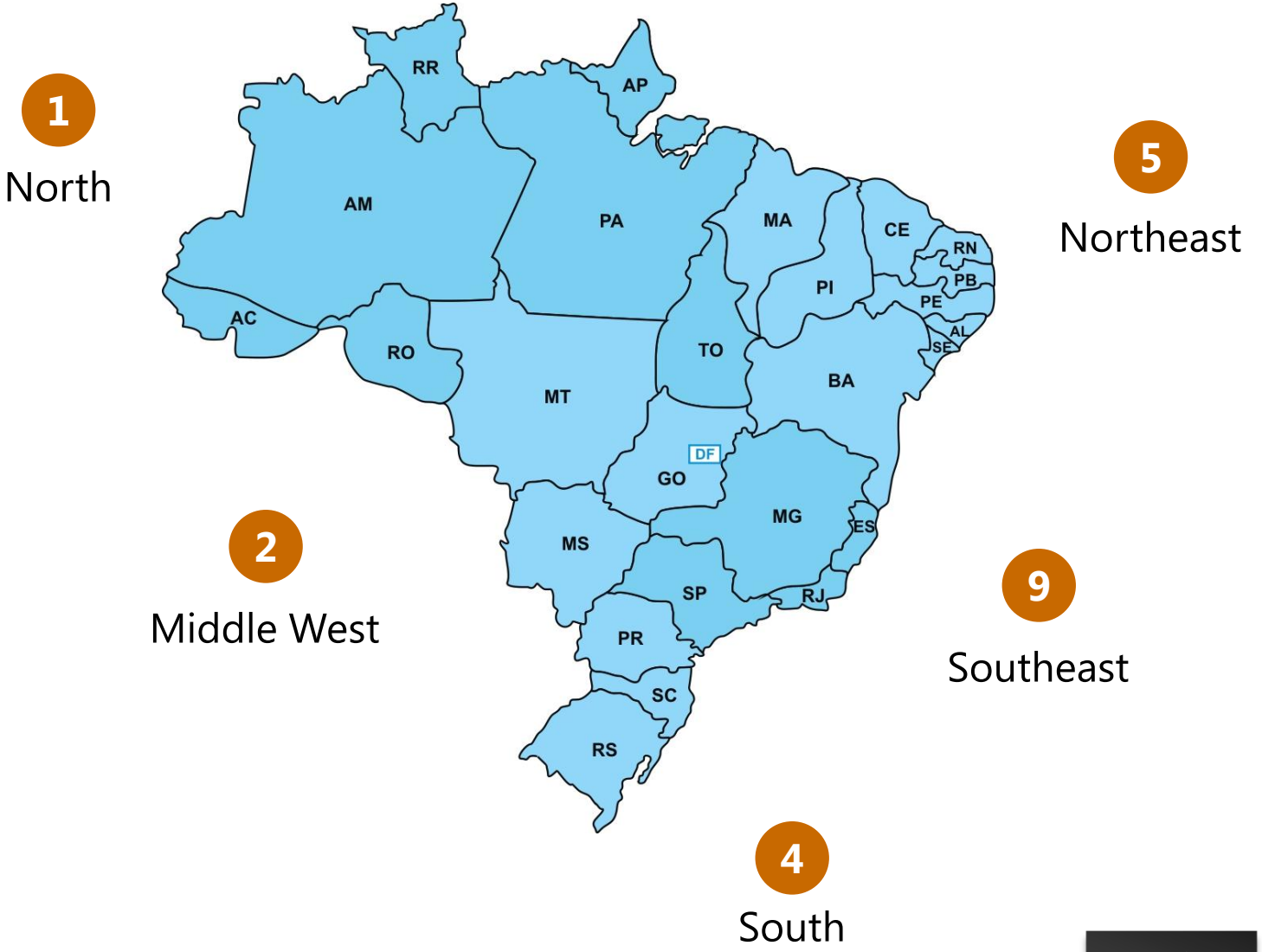
11
South



2010

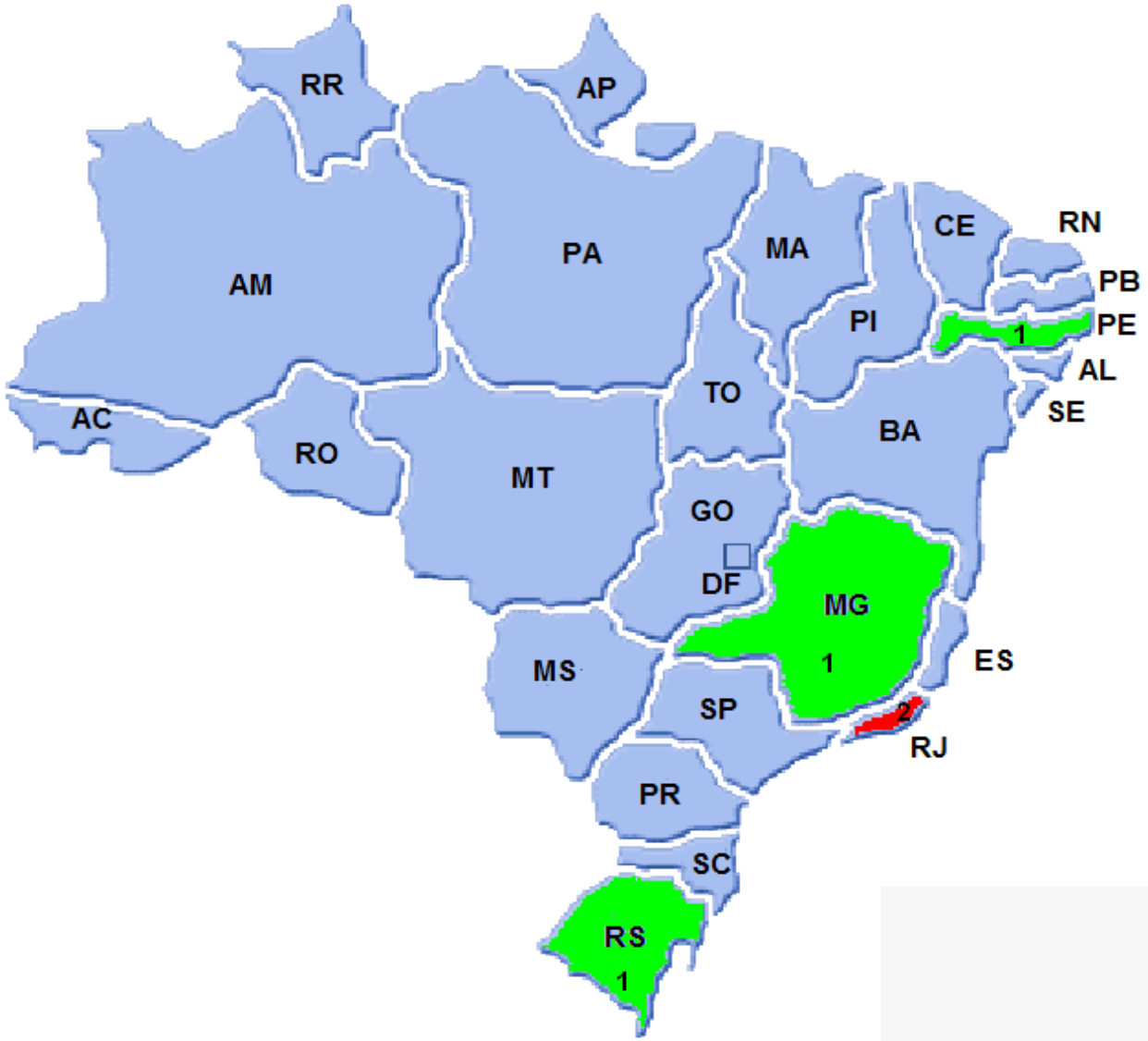
C. S. PhD Programs – Distribution by Region





2010

C. S. Graduate Programs – International Insertion

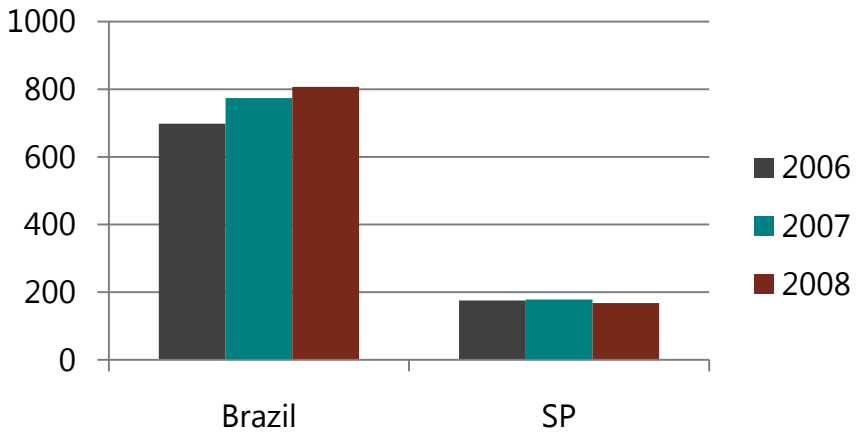


Grade 6

Grade 7

2010

C. S. Advisors Distribution – By Region/State



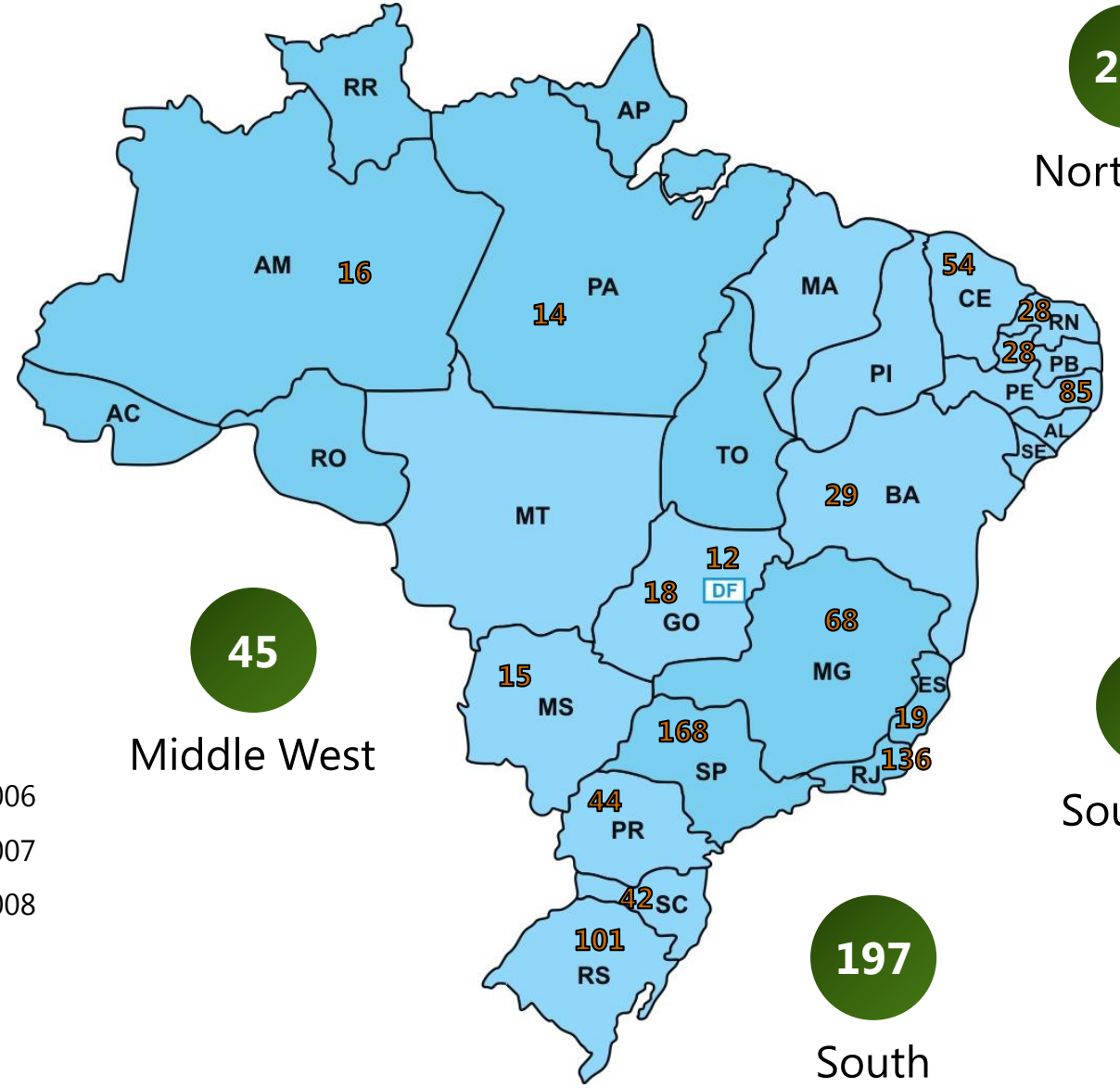
30
North

224
Northeast

45
Middle West

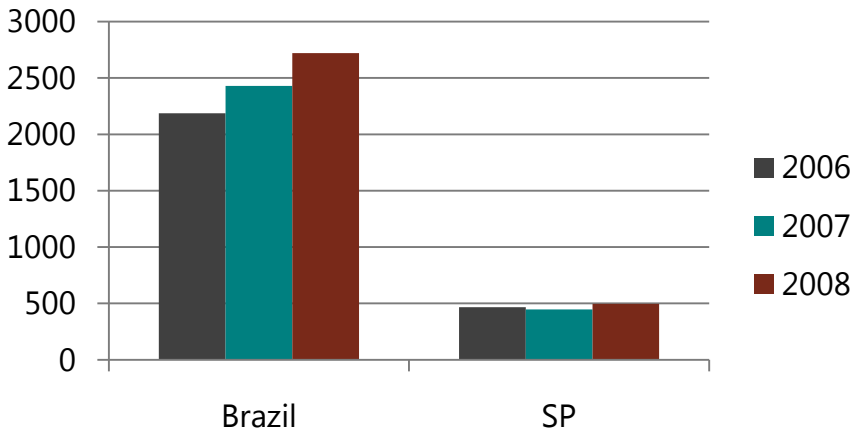
391
Southeast

197
South



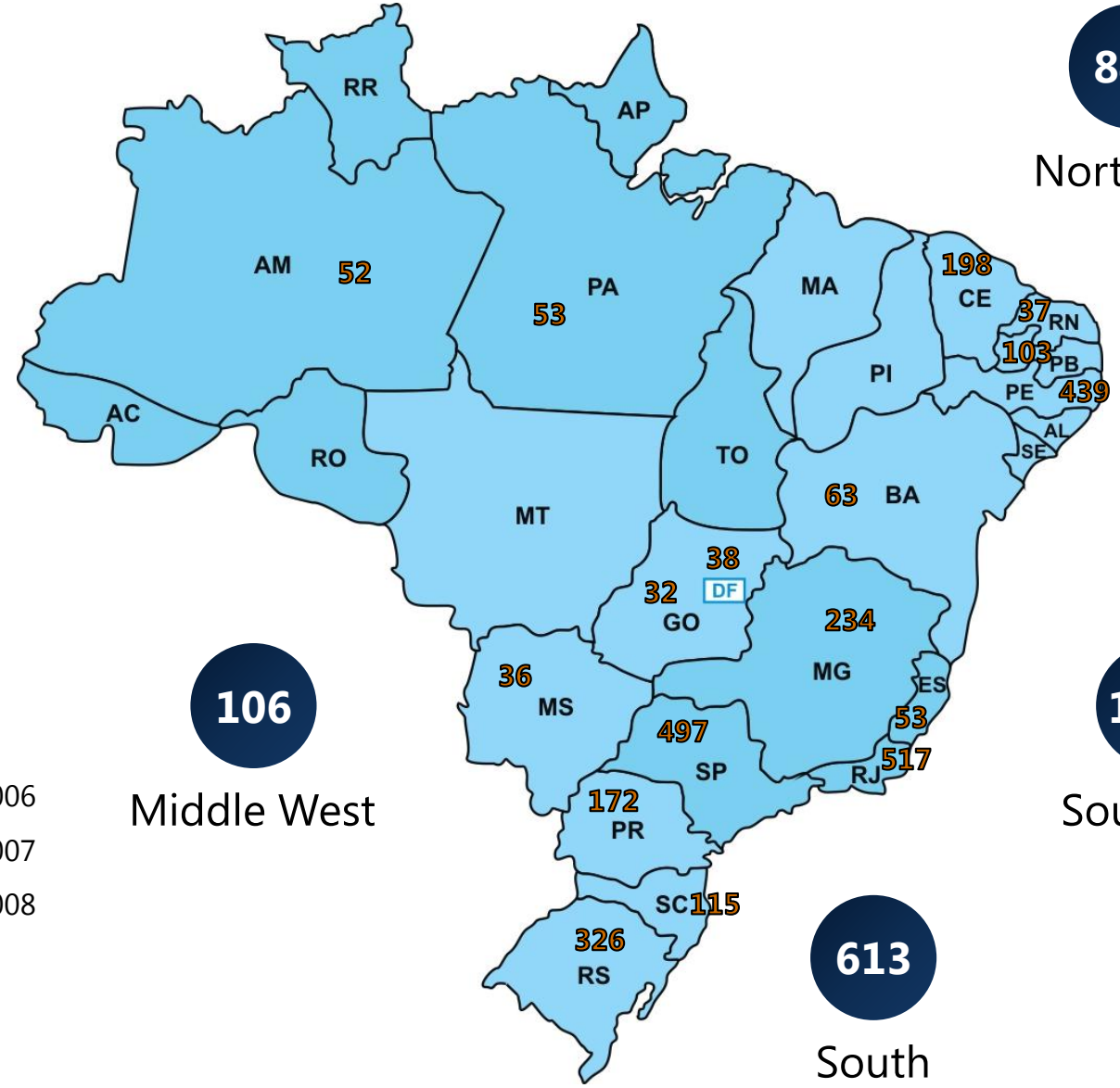
2008

C. S. Master Students – By Region/State



105
North

840
Northeast



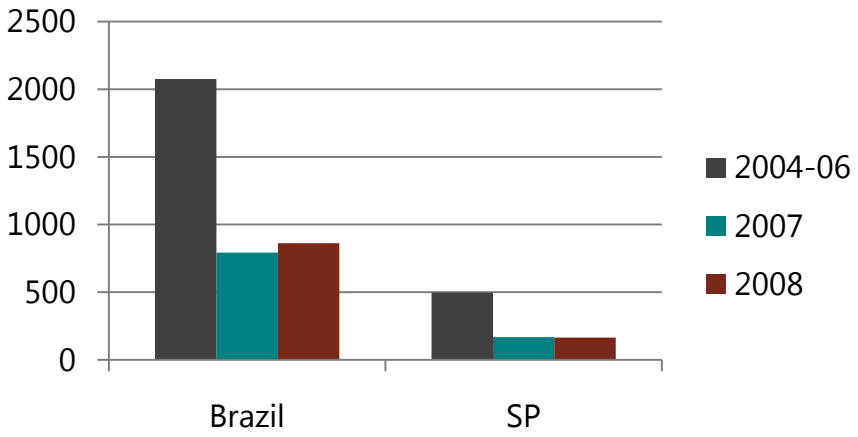
106
Middle West

1301
Southeast

613
South

2008

C. S. Master Thesis – By Region/State



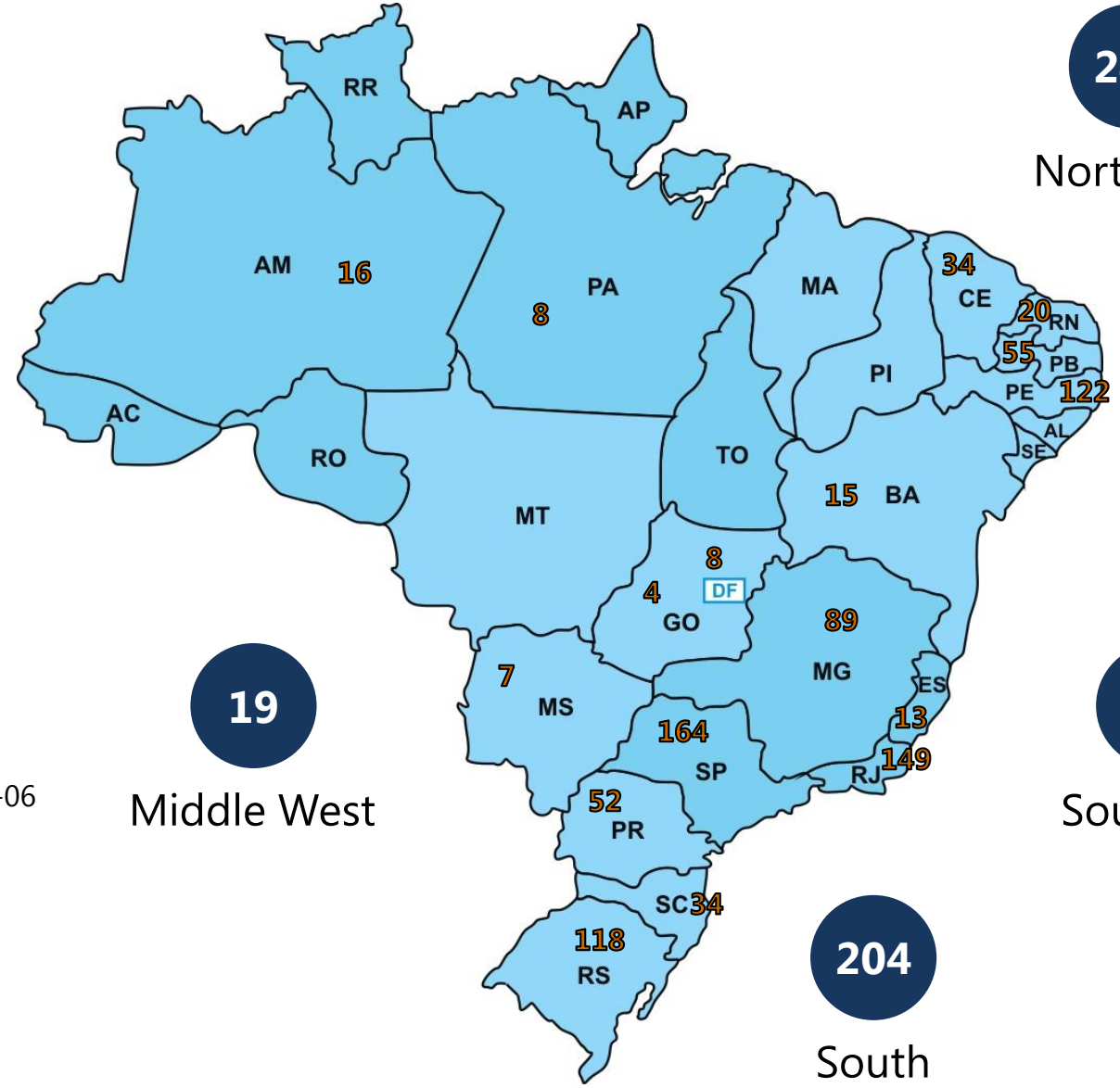
24
North

246
Northeast

19
Middle West

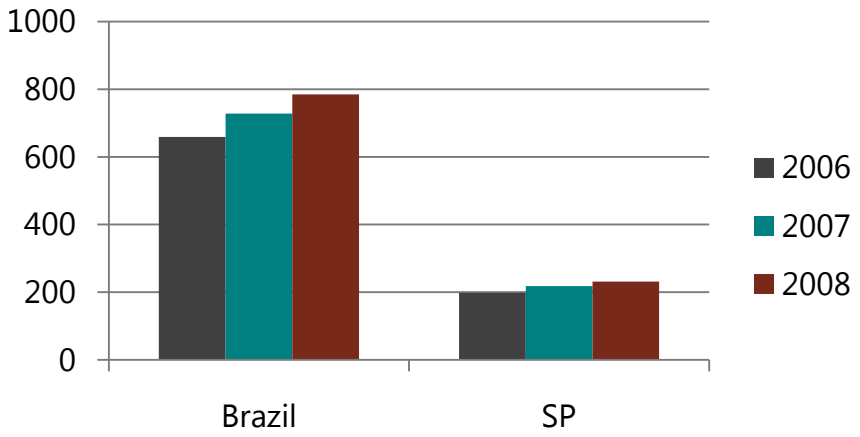
415
Southeast

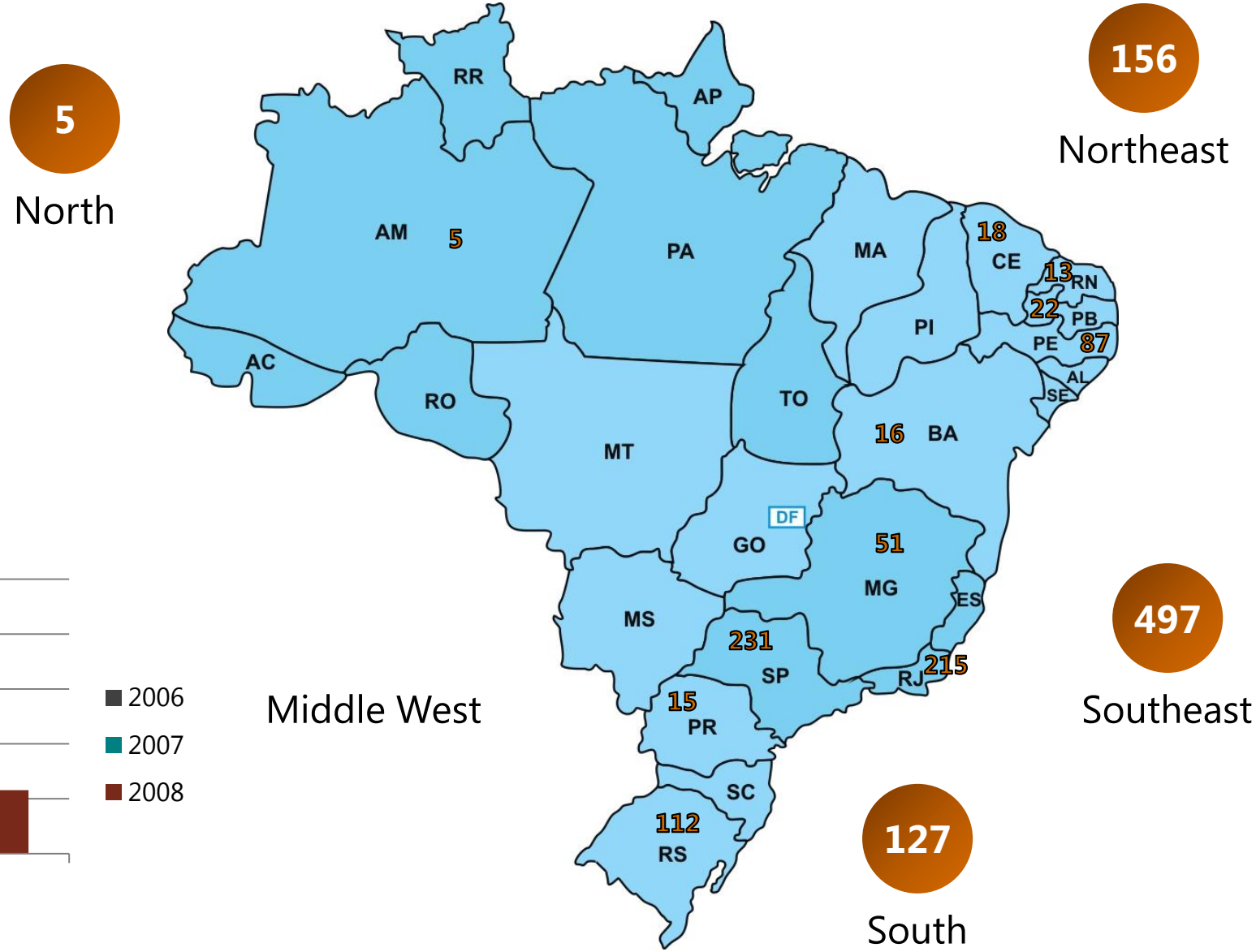
204
South



2008

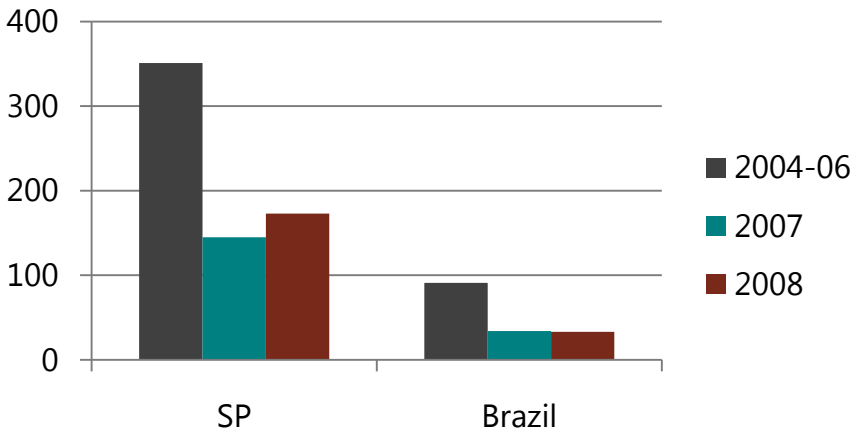
C. S. PhD Students – By Region/State





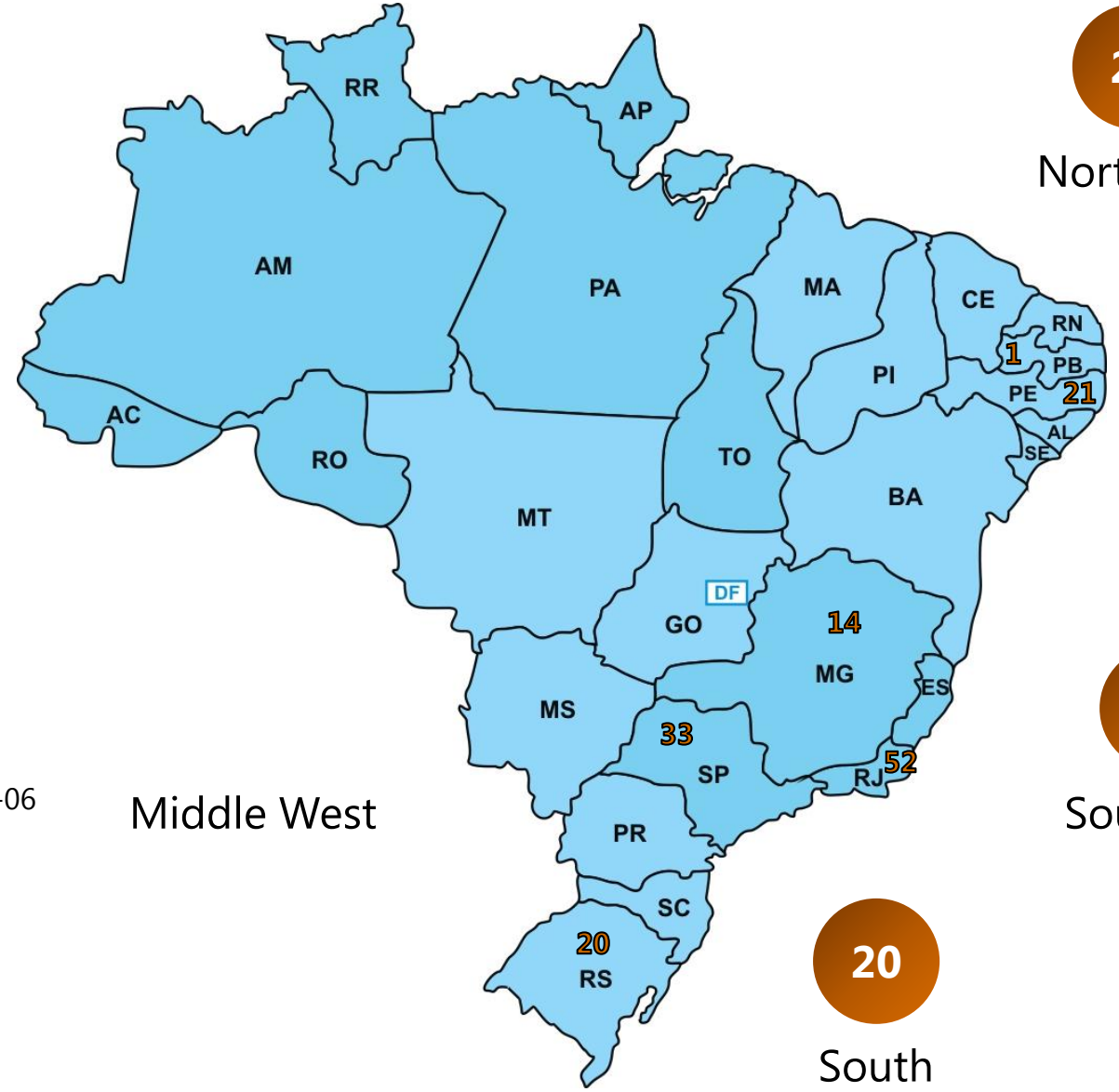
2008

C. S. PhD Dissertation – By Region/State



North

Middle West



22
Northeast

99
Southeast

20
South

2008

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MCT & CNPq & CAPES & FAPs: National Institutes of Science and Technology

INCTs

INCTs – National Institutes of Science and Technology

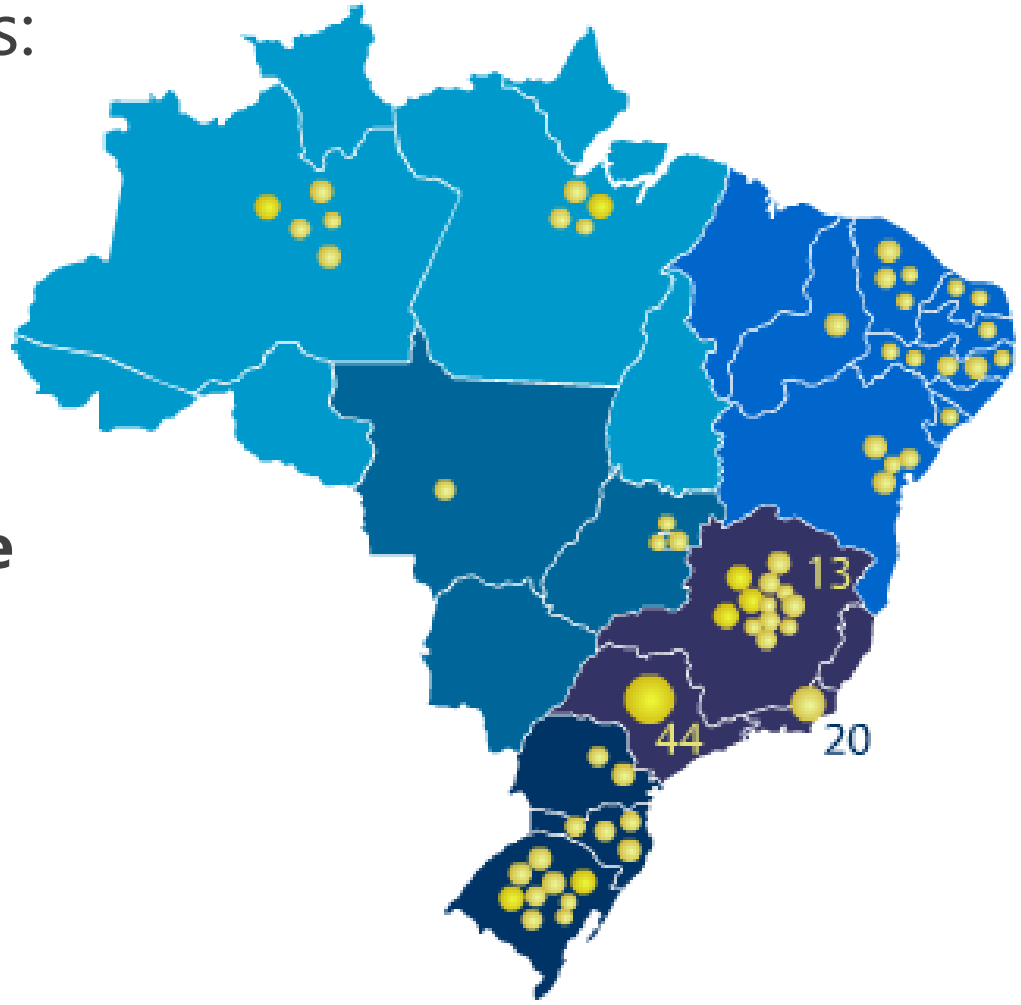
- A National Research Program with Ambitious and Extensive Goals:

  - 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)



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