

The FAPESP-Microsoft Virtual Research Institute in São Paulo, Brazil

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The São Paulo Research Foundation, FAPESP

- Context
 - Research in São Paulo, Brazil and FAPESP
- The FAPESP-Microsoft Virtual research Institute
 - Selected results and motivation
- Opportunities in São Paulo, Brazil
- Perspectives for the FAPESP-MSR Institute

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
1,6% of GDP for R&D

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

The São Paulo Research Foundation

FAPESP

- Mission: to support research in all fields
- Receives 18,000 proposals per year, all peer reviewed
- Funded by the State of São Paulo with 1% of all state tax revenues
- Started operations in 1962
- Annual budget: \$PPP 503 M in 2010 (est. \$PPP 560 M, 2011)
 - Fellowships (3,000 SI, 3,000 MS, 3,000 DR, 1,300 PD)
 - Academic R&D
 - Young Investigators (4y), Research and Innovation Centers (11 y), Thematic Projects (5y)
 - University-Industry Joint R&D
 - Small bussiness R&D
 - 1,500 projects since 1997 (one award per week in 2010)

The São Paulo Research Foundation

Biodiversity, Bioenergy, Climate

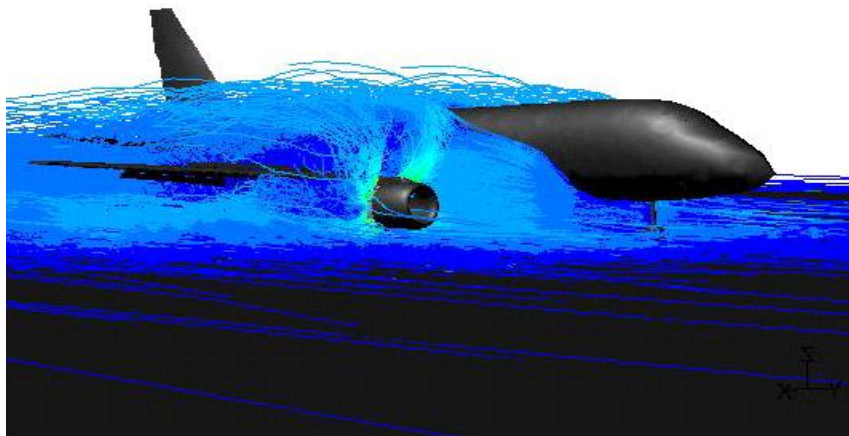
- FAPESP supports research in all fields
 - Through unsolicited proposals
 - Through Special Focussed Programs
- Special Programs
 - Biodiversity in São Paulo – BIOTA
 - Bioenergy – BIOEN
 - São Paulo is the 2nd largest ethanol producer in the world
 - Global Climate Change

Joint university-industry research Agreements and CFPs

- Fapesp and a company issue a joint call for proposals
 - Themes proposed by industry
 - Exploratory R&D
 - Joint Steering Committee
 - Merit review by Fapesp
- Embraer, Natura, Ouro Fino, Oxiteno, Microsoft Research, Telefónica, Dedini, PadTec, SABESP, VALE, Whirlpool, Braskem, ETH.....
- 143 proposals received in 2010

Embraer-FAPESP: R&D to build an innovative jet

CFD simulation and tests
Research co-funded by FAPESP, using
several universities



The FAPESP – Microsoft Research agreement

Co-selection, co-funding of research

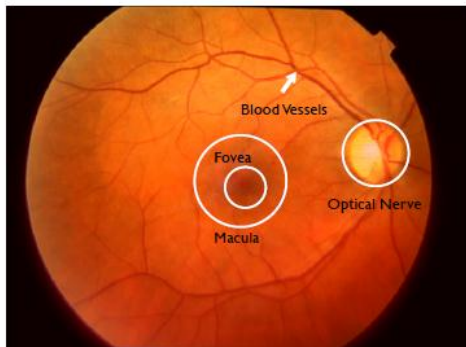
- Signed in 2006
- 4 Calls for Proposals issued
 - 15 research projects selected (<http://www.fapesp.br/en/6185>)
 - Each for a 2 year duration
 - Value awarded: approx. US\$ 2,000,000,00
 - Awards include:
 - Equipment, consumables, travel;
 - Fellowships: 24 MSc; 12 Scientific Initiation
 - Health (3); Bioenergy (3), Environment (4), CS (3), Education (2)

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Identification of Retinal Pathology

- Jacques Wainer and colleagues, Unicamp
- Diabetic retinopathy (DR)
 - Micro vascular retinal changes triggered by diabetes
- Machine Learning and Pattern Classification
 - Images of the human retina
 - Differences in pigmentation and presence of diverse lesions
 - Points-of-interest and visual dictionary
 - Works in different ethnic backgrounds
 - Application to Australian aboriginal population (33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC '11))

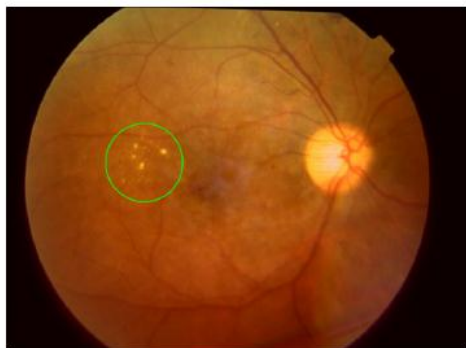
Identification of Retinal Pathology



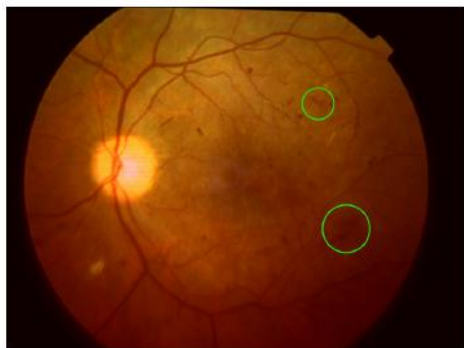
(a) Retina's main regions.



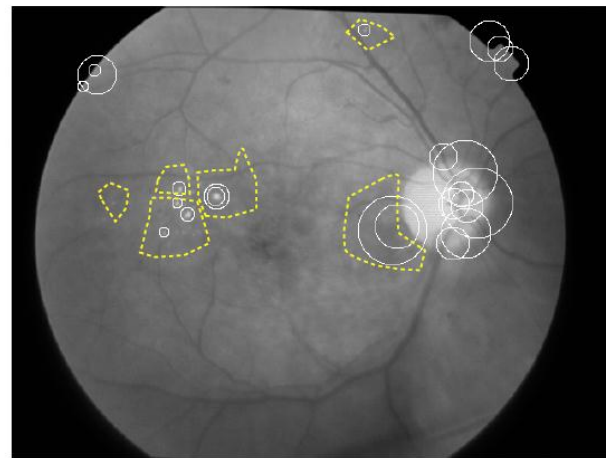
(b) Microaneurysms.



(c) Intraretinal lipid exudates.



(d) Hemorrhages.



Points of Interest marked by SURF (white circles), and by a medical specialist (yellow polygons)

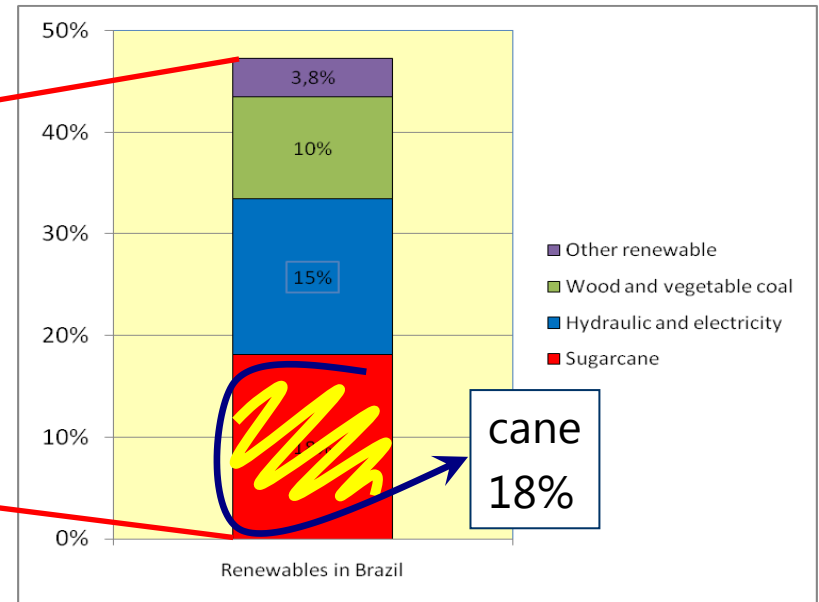
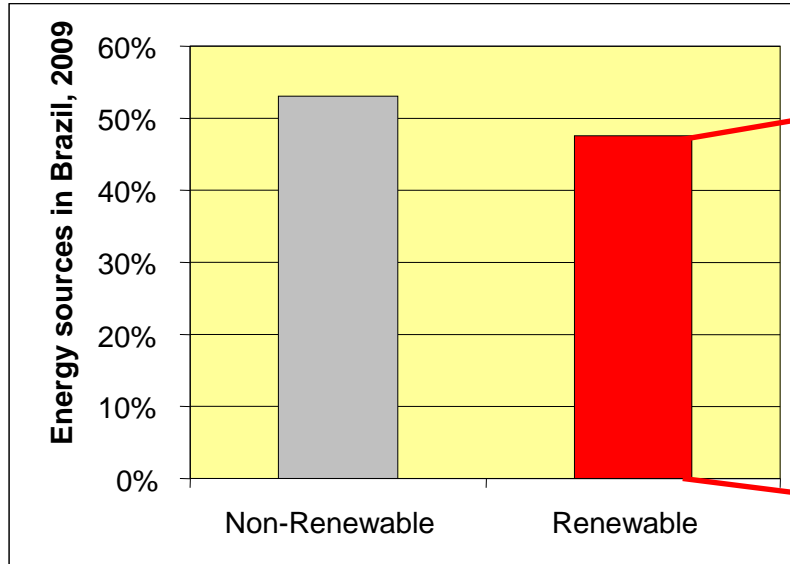
(Source: A. Rocha, T. Carvalho, S. Goldenstein and J. Wainer, "Points of Interest and Visual Dictionaries for Automatic Retina Lesion Screening", submitted)

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BioEnergy

- Bioenergy
 - Information Technology Applied to Bioenergy Genomics: Probabilistic Annotation Using Artificial Intelligence
 - Data Integration in Systems Biology: Characterization of Biological Phenomena from Structural and Functional Information
 - Environmental Monitoring and Modeling of the Genetic Potential of Sugarcane Cultivars under Appropriate Water Availability in the Soil

48% of Brazil's energy comes from renewable sources (2009)



Renewables in Brazil: 48%; World: 13%; OECD: 7,2%

FAPESP-Microsoft Virtual Research Institute Environment

- Environment
 - SinBIOTA 2.0 - BIOTA-FAPESP Program's Information System: Planning the Next 10 years
 - AgroDataMine - Development of Algorithms and Methods of Data Mining to Support Researches on Climate Changes Recording Agrometeorology
 - Development and Application of Network of Geosensors for Environmental Monitoring
 - E-Phenology: The Application of New Technologies to Monitor Plant Phenology and Track Climate Changes in the Tropics

Post-doctoral opportunities

- Three year duration (5 years in some cases)
 - Stipend
 - Travel for awardee and family
 - Support for moving and installation
 - Plus 15% fo research incidentals (travel, small equip.)
- 1,313 proposals, 779 awards in 2010
 - 59% success rate; 3 awards/workday
 - 1,484 fellowships paid in June, 2011

FAPESP

Young Investigator Awards

- 4 years grant
 - PI will work in a research institution in São Paulo (does not have to be a Brazilian)
 - Fellowship for PI
 - Equipments, Consummables, Travel
 - Fellowships for students
- 2,922 proposals, 1,016 awards since 1996
 - 219s/78a in 2010 (1.5 per week)

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Perspectives

- A solid collaboration base
- Growing interaction with scientists at MSR
 - Workshops, visits
- Move to higher impact research
 - Longer project duration – 4-5 years
 - Include PhD fellowships
 - Intensify interaction with MSR aiming at
 - Tapping the pool of excellence at MSR
 - More intense and effective use of MS technologies

Microsoft Research

Faculty Summit



FUTURE WORLD 2031

2011

Microsoft Research-FAPESP

Virtual Research Institute, São Paulo, Brazil

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Education, Health

- Education
 - E-Citizenship: Systems and Methods for the Constitution of a Culture Mediated by Information and Communication Technology
 - PorSimples: Simplification of Portuguese Text for Digital Inclusion and Accessibility
- Health
 - Borboleta: Integrated Mobile System for Home Healthcare
 - Automated Screening for Diabetic Retinopathies: IT in the Fight Against Preventable Blindness
 - A Cultural-Sensitive Environment for Flexible Natural Interaction to Support Transitioning from a Chronic Care Hospital Context

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CS

- X-GOV: Crossmedia for Government Services
- E-Farms: A 2-Way Road from Small Farms into the Networked World
- JamSession - A Decentralised Architecture for specialized worlds and the Web 3.0