GPAI PARIS SUMMIT 2021

AI in Latin America

Opportunities, challenges, and a possible roadmap for AI for the social good in Latin America

With the support of the French Embassy in Chile

Chair:

Nayat Sánchez Pi
Director Inria Chile

01

Opening

AI in Latin America

Guido Girardi
Senator Republic of Chile.

Ricardo Baeza
Professor. IEAI, Northeastern University, USA; Prof. UPF, Spain; and Prof. Universidad de Chile, Chile

Carlos Coello
Full Professor at Center for Research and Advanced Studies, Mexico

Marley Vellasco
Full Professor at Pontifical Catholic University of Rio de Janeiro, Brazil

Ana Cristina Bicharra García
Full Professor Federal University of the State of Rio de Janeiro, Brazil

Luis Martí
Research Director Inria Chile, Chile

AI in Latin America Working Group

IDENTIFY OBSTACLES

What are the main issues and problems that create and widen the AI gap in Latin America

NOT YET ANOTHER DESCRIPTION

Our goal was not go over a country-by-country account of the status of AI.

ROADMAP

A call for focused actions. A roadmap for a set of interrelated topics that can serve to a positie socio-economic impact of AI in the region.

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A ROADMAP FOR AI IN LATIN AMERICA

A position paper

A ROADMAP FOR
AI IN LATIN AMERICA

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CONTENTS

AI IN LATIN AMERICA

THE NEED AND OPPORTUNITIES FOR AI

Strengthening the AI ecosystem in Latin America is important both for the prosperity of the region and for accelerating progress in the global field of AI.

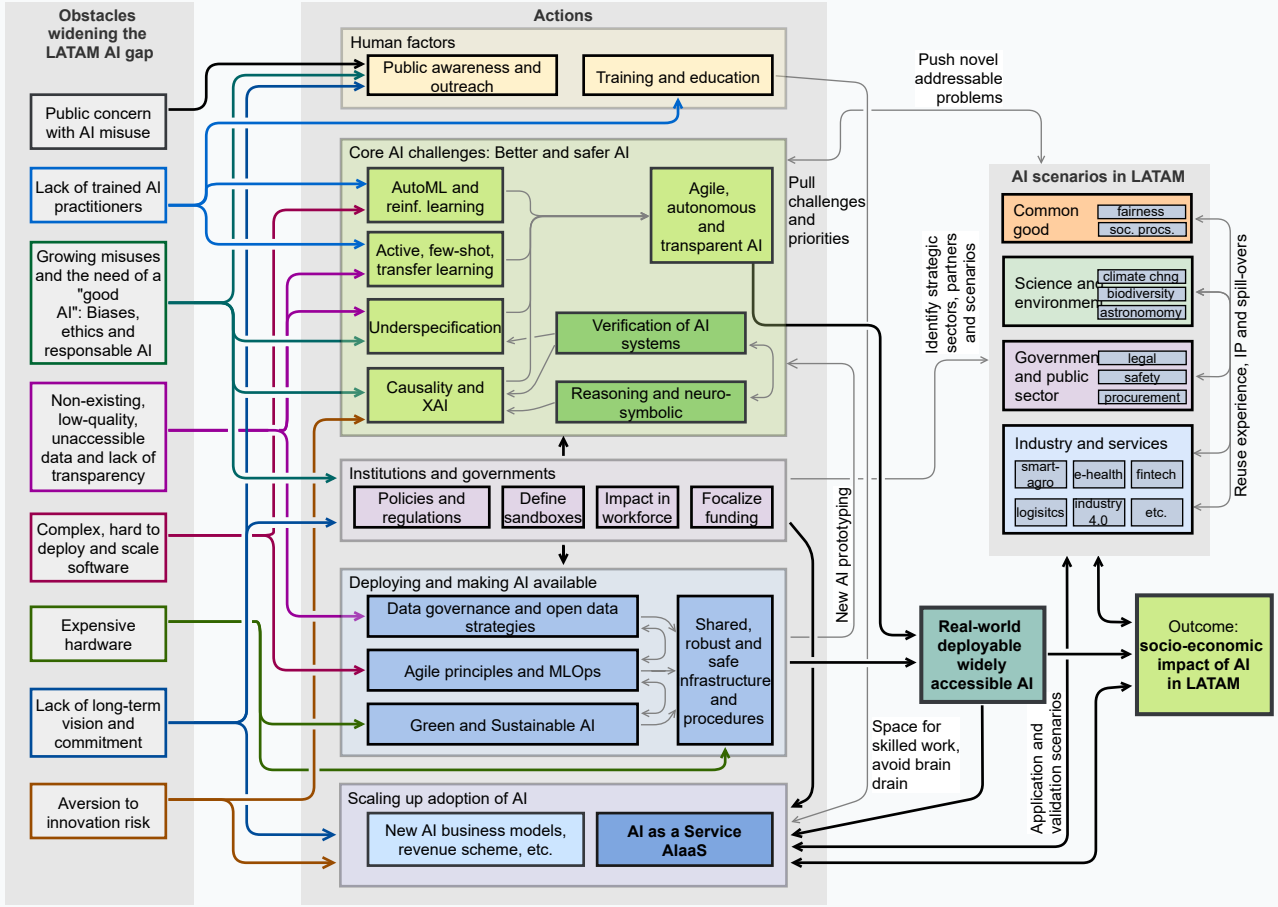
CHALLENGES IN LATIN AMERICA

Public concern with AI; lack of trained practitioners and professionals; growing misuses and the need for a good AI; non-existing, low-quality, inaccessible data and lack of transparency; lack of an scalable and accessible AI software and hardware; aversion to innovation risk; lack of investment long-term planning; brain drain, etc.

HIGHLIGHTS AI IN LATIN AMERICA

Argentina
Brazil
Chile
Colombia
México
Perú
Uruguay

A roadmap for action in Latin America



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Invited guest

Guido Girardi

Senator Republic of Chile.
President of the Commission for Challenges of the Future, Science Technology and Innovation of the Senate of Republic of Chile.

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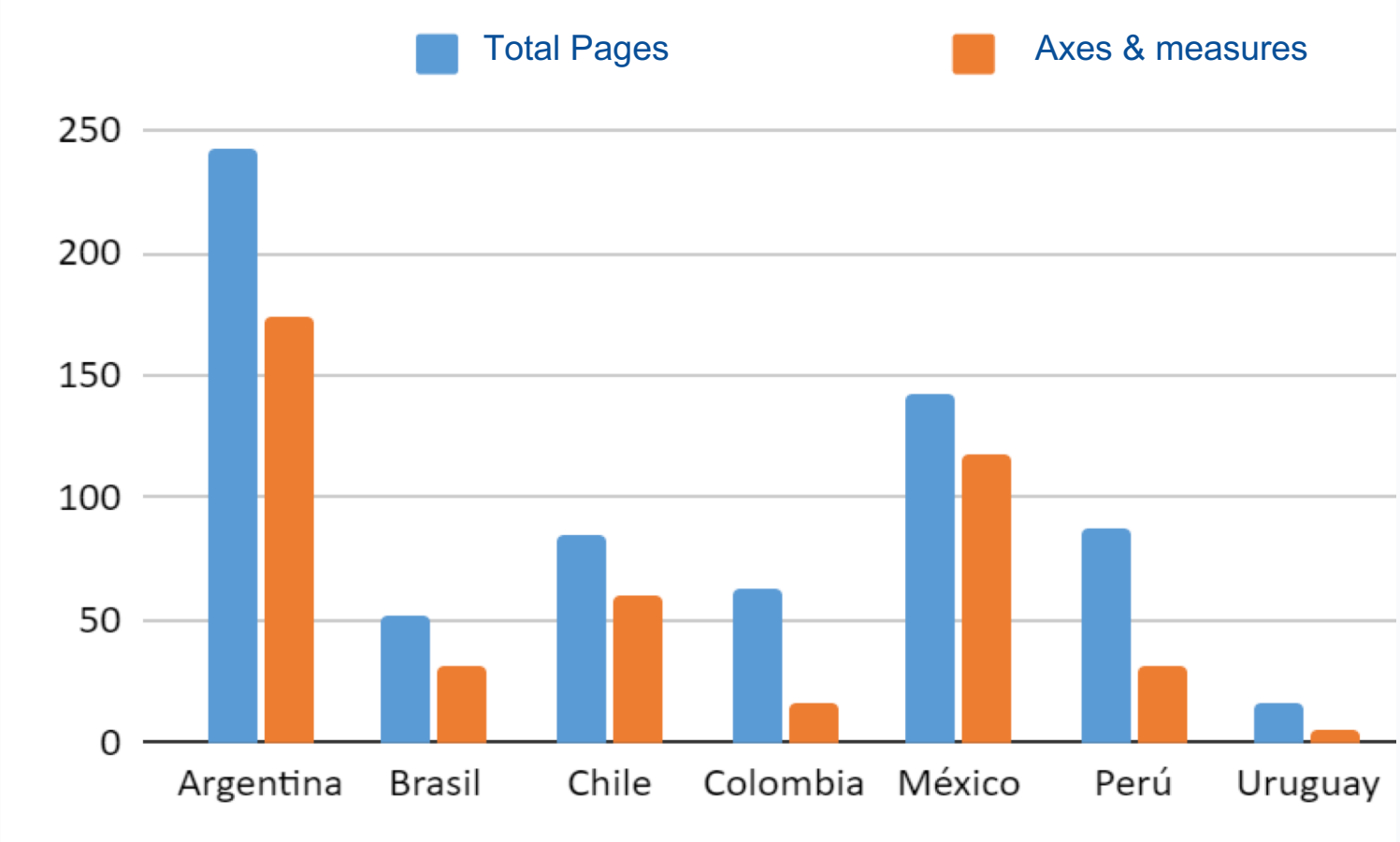
Timeline

2018 2019 2020 2021 .

Quick Syntactic Comparison



Quick Content Comparison

- **Most common Ibero American axes**
  - Research and Technology Transfer (100%)
  - Industry ecosystem (93%)
  - Public sector (93%)
  - Talent Training and attraction (86%)
  - Data platform and its policies (71%)

- **Highlights**
  - Colombia: budget, governance, action plan, ethics
  - México: multi stakeholder proposal
  - Uruguay: focus on digital government

Chile

- Preliminary strategy in December 2020
- Consult period of one month (200+ replies)
- Final version in October 2021 (78 pages)

- Four principles:
  - Centred in well-being, human rights and security
  - Sustainable development
  - Inclusion
  - Globalization and change

Chile: Axes

- Habilitation Factors (11 goals)
  - Talent, technological infrastructure and data
- Development and Adoption (7 goals)
  - Research, technological transfer, innovation, digital government, etc.
- Ethics, Regulation and Societal Impact (10 goals)
  - Work, ecommerce, IP, Cybersecurity & defense, and gender.
- Action Plan (74 pages)
  - 80 priority actions
  - 184 Initiatives

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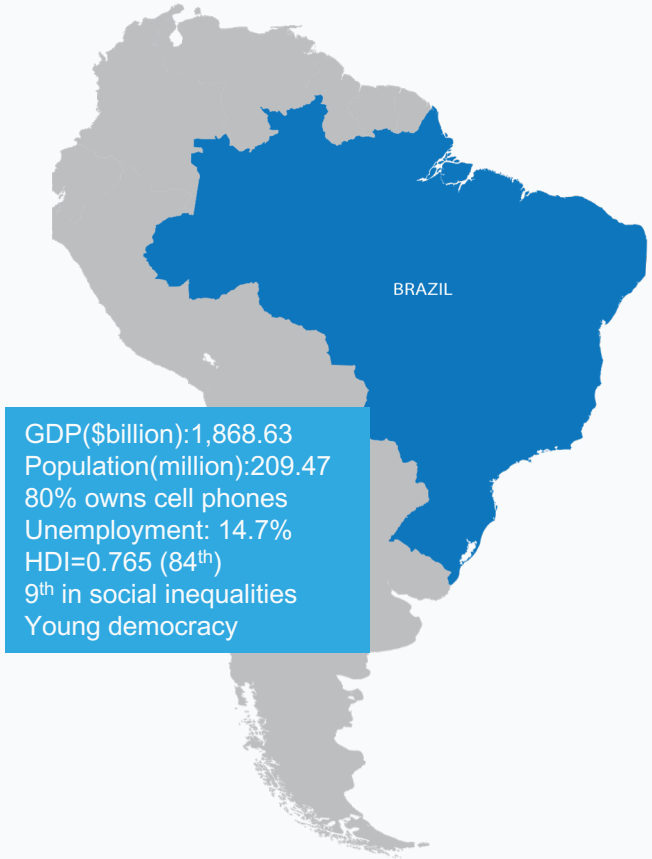
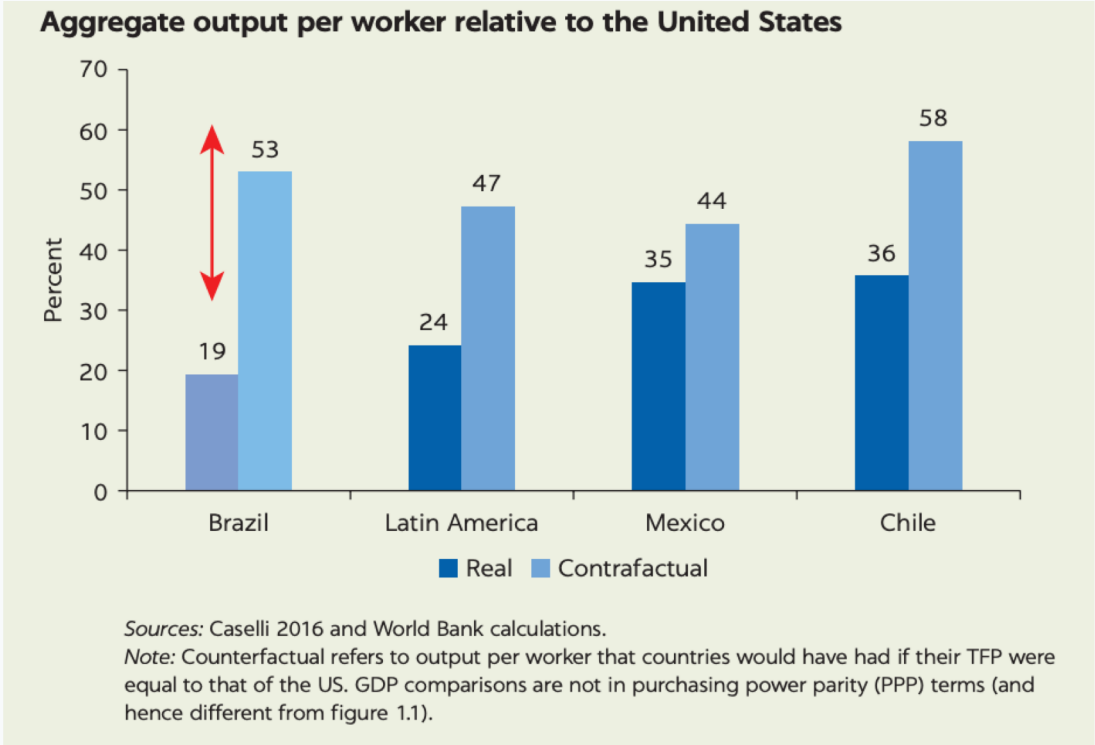
AI could make the Brazilian economy leapfrog development stages



GDP($billion):1,868.63
Population(million):209.47
80% owns cell phones
Unemployment: 14.7%
HDI=0.765 (84th)
9th in social inequalities
Young democracy

GDP=*f*(Capital, Labor, Total Factor Productivity)



Sources: Caselli 2016 and World Bank calculations.
Note: Counterfactual refers to output per worker that countries would have had if their TFP were equal to that of the US. GDP comparisons are not in purchasing power parity (PPP) terms (and hence different from figure 1.1).

Figure taken from Dutz, M. A. (2018). *Jobs and Growth: Brazil's Productivity Agenda*. World Bank Publications.

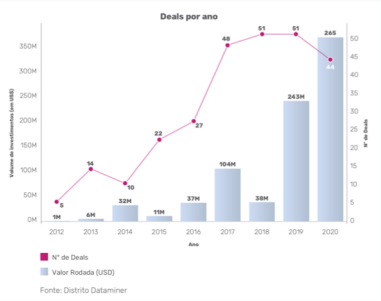
Public investments have been unstable reflecting a lack of long-term planning

Recent Public investments in AI have been significant

- EBIA (2021- Brazilian AI strategy)
- AI as strategic area for research grants
- Creation of 6 centers of excellence in AI (8 more to come)
- Public administration is using AI
- All CS Universities including AI courses (many AI graduate and 3 AI undergraduate degrees)

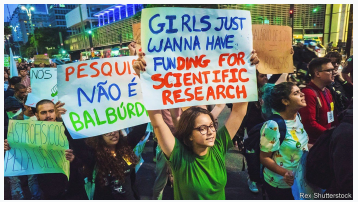
Private investments have been still timid, but increasing:

- $ 839 M invested since 2012 (mostly 2019 & 2020)



The challenges for Brazil, as in any LA countries are:

- **Lack of investment long-term planning**
- **Brain drain**
  - Cuts in funds for research
  - Few jobs for high skilled workers

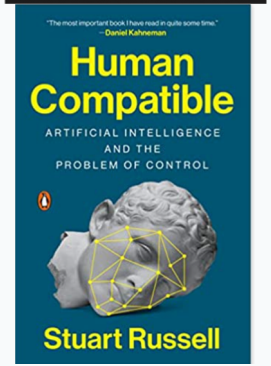


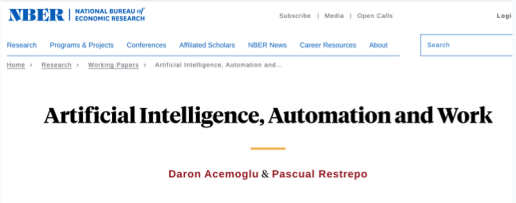
AI development and use need to be regulated to determine scope, responsibilities and citizens' privacy guarantees.

- AI learns from data that record humans' decisions with built-in moral values
- A way to deal with the AI ethical dilemmas (fairness, transparency, accountability & morality) is through regulation
- Brazil is working on AI regulation (development and use of AI):
  - **Federal level:** Brazilian GDPR (LGPD) : General Data Protection Law (into effect since Feb 2020)
  - **Federal level:** PL **20/21** (Eduardo Bismarck) 1rst round of approval: defines responsibilities and the need for "Human in the Loop"
  - **State level (RJ):** PL **3409/2020** (Enfermeira Rejane) for public discussion: limits the use of AI software by public administration
  - **City level (Rio):** PL **824/2021** (Reimont) for public discussion: prohibits facial recognition
- Challenge
  - Defining the right amount of regulation, without inhibiting AI development
  - Assessing the risks of the technology

Food for thought: AI may worsen Brazil's social inequalities.

- "AI/robots are part of labor-saving technology that will lower wages (and possibly jobs) unless there is some offsetting expansion of aggregate demand." *Freeman 2018*
- *"*a low wage country with low labor productivity could have greater incentive to robotize than a high wage country with high labor productivity" *Freeman 2018*
- AI may increase wealth concentration
  - Excessive automation, fewer jobs (or new jobs but with lower wages)
  - Fewer people on the top and fewer companies
  - Power will be with who owns the data and the robots
  - Democracy @risk
- Food for thought
  - Public regulation
  - Ownership for workers (e.g., more disseminated stock options schemes)
  - Paths to Ownership by citizens (e.g., Pension Funds)
  - Universal Basic Income (UBI)
- Call the economists…





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Metaheuristics and their role in Mexico and Latin America

- In the last 25 years, there has been an increasing interest in metaheuristics in Latin America,
- not only within computer science departments, but also in other areas such as automatic control, engineering, physics and chemistry, among many others.
- The fact that the two major conferences on evolutionary algorithms have taken place in Latin America (in Mexico and Brazil) in recent years is a clear indication of this interest and of the potential that metaheuristics have in Latin America.
- In Mexico has several small companies that develop applications that involve optimization, forecasting and/or decision making tasks based on the use of metaheuristics.
- Such applications have had a good acceptance by local industry, since users have found them easy to use and they have been very effective (i.e., they contributed to increase their income).

Metaheuristics and their role in Mexico and Latin America

- Nevertheless, the assimilation of solutions developed in Mexico based on Metaheuristics remains as a difficult task within certain industrial sectors (particularly within large companies which prefer to buy these solutions abroad).
- Finally, a sustained AI strategy in Mexico (and in Latin America in general) is very challenging, because it is very difficult to sustain long-term projects (most initiatives are limited to one Presidential term).

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AI Research Centres in Brazil

- Brazil has recently launched a program to approve **Centres of Applied Research in Artificial Intelligence**: Health, Agriculture, Industry and Smart Cities.
- Foundation for Research Support of the State of Rio de Janeiro (FAPERJ) has also approved 3 Centres: Renewable Energies and Climate Change; Oil and gas; Industry 4.0; Education; Agribusiness; Smart Cities; Public and Cyber Security; Health; Ethical issues in the application and use of technologies; and Technological Regulation
- **CIA-Rio** (AI Research Centre in Rio de Janeiro) received initial support from **Oil & Gas** companies but also focuses on **smart agriculture** and **health**
- Commitments: “Generate **disruptive solutions** with the potential to: **revolutionize** how we live, interact, work, learn, evolve and communicate; provide **socioeconomic benefits for society**; **improve quality of life**; **leverage economic prosperity** and **solve big problems** that has no solutions today”

Challenges to achieve responsible AI in Brazil

- **Long-term financial support** from government agencies to these newly formed research centres and other research organizations
- **Convince industries and smaller companies** to invest in Research and Development of applied AI, to sustain theses centres in the long term
- **Retention of young scientists** in the research centres
- Avoid the “cowboy-style approach to modelling”

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Characteristics of Latin America bring additional requirements for AI

Shared by other areas, i.e., Asia, Africa, etc.

Diversity:

Languages:

- Spanish, Portuguese, English, German, Italian, Arabic, Chinese, Japanese, etc.
- Quechua (8M), Guarani (5M), Aymara (2.5M), Mapudungun (500k), etc.
- Many are poorly documented (low resource languages).

Physiognomy, clothing, traditions, social conducts, etc.

Lack of regulation and ethical foundations:

Higher risk of misuse.
As scientists we must look into how to build-in features that ensure fair and proper use.

Cultural biases towards (local) technology:

Preference for importing ”ready” solutions over developing local ones.

Technological resources context:

Few resources when developing; fewer resources when deploying.

…and many more!

AI in/for Latin America calls for a special approach, but perhaps that is the approach we need for all AI.

03

Q & A

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04

AI in Latin America Working Group

Final Remarks

GPAI | THE GLOBAL PARTNERSHIP ON ARTIFICIAL INTELLIGENCE

THANK YOU

Contact informations
http://gpai-aila.inria.cl