ROGÉRIO A. GUIMARÃES JR.

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EDUCATION

California Institute of Technology — *Pasadena, CA*
Incoming Ph.D. Student in Computation and Neural Systems — *September 2021 - May 2026*

Massachusetts Institute of Technology - *GPA 4.7/5.0* — *Cambridge, MA*
Candidate for Bachelor of Science in Computer Science and Engineering — *September 2017 - May 2021*
Candidate for Bachelor of Science in Linguistics and Philosophy

Selected coursework: Intro to Probability, Design and Analysis of Algorithms, Intro to Data Science and Statistics, Software Construction, Computer Systems Engineering, Computational Cognitive Science, Philosophy of Language, Language Acquisition, Intro to Neuroscience, Intro to Psychological Science.
Graduate coursework: Machine Learning, Aspects of a Computational Theory of Intelligence, Advanced Natural Language Processing, Advanced Data Structures.

PROFESSIONAL EXPERIENCE & RESEARCH

MIT Laboratory for Information and Decision Systems (LIDS) - *www.lids.mit.edu* — *Cambridge, MA*
Undergraduate Researcher — *January 2019 - Present*

- **Reinforcement Learning for Agricultural Management Policy Recommendation** *(February 2020 - Present)*
  Developed models for automated optimal decision making in agricultural management in Sub-Saharan Africa based on crop yield using Deep Reinforcement Learning. The WOFOST model was used to simulate farms and generate artificial data to train the models. This work is still in completion.
- **Nonlinear Dynamical Systems** *(September 2019 - December 2019)*
  Investigated the use of Recurrent Neural Networks in predicting the behavior of Nonlinear Dynamical Systems. Found that Convolutional layers improved sensibility to local changes in the behavior of the system. Presented the work in a poster in the SuperUROP Showcase, part of the Advanced Undergraduate Research Opportunity Program.
- **Seizure Detection** *(January 2019 - May 2019)*
  Developed models for the prediction of seizure events in epilepsy patients based on time-series data from their EEG readings. Identified feature extraction and data resampling techniques that maintained interpretability while maximizing the accuracy of common machine learning models.

Bridgewater Associates - *www.bridgewater.com* — *Westport, CT*
Investment Engineering Intern — *June 2020 - August 2020*

- Utilizing learned macroeconomics concepts and understanding of global markets, analyzed select case studies to develop hypothesis of what was happening in the business cycle.
- Analyzed and built a fully automated sample bond trading system.

Pegasystems - *www.pega.com* — *Cambridge, MA*
Software Engineering Intern — *June 2019 - August 2019*

- Member of a core engineering team with the task to speed up the initialization of Kubernetes nodes when running Pega Platform, the main product of the company, in the cloud.
- Collaborator in the root cause analysis that found a bottleneck caused by requests to the database for java classes. Worked in the implementation of a solution that pre-loaded such classes directly in the docker image used in the nodes.

Organização Educacional Farias Brito - *www.fariasbrito.com.br* — *Fortaleza, Brazil*
Competitive Programming Teacher — *November 2016 - May 2017*

- Taught competitive programming and logic to students from 6^{th} to 12^{th} grade in one of the best schools in informatics olympiads in Brazil. Two students classified to the International Olympiad in Informatics in the 2017 Team Selection Tests.

PROJECTS

- **Meta-Visualization: Investigating Rapid Learning and Feature Reuse**
  Final Project for 6.867 - Machine Learning (2019)

  Investigated the nature of the meta-learning process in algorithms like MAML through the development of a visualization tool for the learning path in the loss landscape and geometric interpretations of rapid learning and feature reuse.

- **Translating Tweets from Trumpese to Sanderese with Transformers and CycleGANs**
  Final Project for 6.864 - Advanced Natural Language Processing (2020) - Single Author

  Used Transformers to apply Cyclic Generative Adversarial Networks to the Natural Language Processing domain, attempting to transfer styles between tweets of different users

- **Bayesian Few Shot Learning of Compositional Instructions**
  Final Project for 6.804 - Computational Cognitive Science (2019)

  Developed a Bayesian Model that reproduced human behavior when given the sequence-to-sequence task of interpreting a list of instructions in an artificially generated language to generate a sequence of colors.

- **Non-adult Behavior of Children's Quantification in Logical Deduction Outside of the Language Domain**
  Final Project for 24.904 - Language Acquisition (2020) - Single Author

  Proposed a psycholinguistic experiment to evaluate whether exhaustive pairing, a non-adult judgement common in children in ages 4 to 6, is caused by pragmatic or semantic reasons. Experimenters would induce children to make the deductive reasoning required by quantifiers like *every* without using them, and evaluate whether exhaustive pairing would persist.

- **Implementing a Fusion Tree in C++ (2017)**
  Final Project for 6.851 - Advanced Data Structures (2017)

  Implemented a fully functional and well documented fusion tree that can perform predecessor queries in sets with limited capacity using only a constant number of operations in a general BigInt.

AWARDS

- **International Olympiad in Informatics (IOI) - Silver Medal** (2016, Russia), **Bronze Medal** (2017, Iran)
  The IOI was initiated by the UN and is the most prestigious computer science competition for HS students in the world. It requires knowledge on advanced data structures and algorithms and has contestants from more than 80 countries.
- **Caltech Tianqiao and Chrissy Chen Graduate Fellow** (2021)
  Fellowship provided to exceptional first-year graduate students in neuroscience options at Caltech
- **MIT EECS Undergraduate Research and Innovation Scholar - SuperUROP** (2019/2020)
  A year-long program for selected students in EECS that provides sponsorship and academic advise for their research projects.
- **MIT Burchard Scholar** (2019/2020)
  Selected group of 38 undergraduate students who have demonstrated outstanding abilities and academic excellence in some aspect of the humanistic fields: the humanities, arts, and social sciences.
- **Estudar Fellow** (2017)
  Founded by the three most prominent Brazilian businessmen, Fundação Estudar awards scholarships and connects talents who want to positively impact Brazil (33 selected among 83,000 applicants).

LEADERSHIP & PERSONAL INTERESTS

- **CodCad** *(2016 - 2019)*
  Co-founded a company to provide introductory and advanced online courses in CS. The platform had more than 9,000 users and was recommended by the Brazilian Olympiad in Informatics. Finalist in Microsoft Imagine Cup Brazil 2017
- **Brazil Conference at Harvard & MIT** *(2019)*
  Conceived, managed, and mediated a panel with four of the most famous Brazilian YouTubers about new communication media. The Brazil Conference is yearly organized by Brazilian students in Boston. In 2019, it had 900 participants and 80 speakers that included the Brazilian vice president, congressmen, and entrepreneurs.
- **Ousadia** *(2018 - Present)*
  Created and captained Ousadia, the soccer team of the Brazilian Students Association of MIT. It reached new members for the association and connected with non Brazilian members of MIT. We won two intramural competitions.
- **Noic** *(2016 - 2017)*
  Presided Noic, a national project in Brazil to democratize access to science olympiads. Our website had 200,000 visitors per year and I initiated authorial online courses to give students to have access to studying materials despite their school conditions.

SKILLS

Computational Skills: Advanced Algorithms and Data Structures construction and analysis, Machine Learning, Reinforcement Learning, Natural Language Processing, Statistics & Data Science, C & C++, Python, Java, PyTorch, Scikit-Learn, Keras.
Languages: Portuguese (native), English (fluent), Spanish (advanced)