

Matheus Sobreira Farias

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EDUCATION

Harvard University <i>Ph.D. in Electrical Engineering</i> Working on efficient hardware architectures for machine learning. Advised by Prof. H. T. Kung (link)	Cambridge, MA 2021–PRESENT
Harvard University <i>M.Sc. in Electrical Engineering</i> Relevant Coursework: Hardware Architectures for Deep Learning (A), Tiny Machine Learning (A), High Performance Computing for Science and Engineering (A), Advanced Computer Architecture (A)	Cambridge, MA 2021–2024
Federal University of Pernambuco <i>B.Sc. in Electronics Engineering</i> 1st out of 40 students, GPA 8.90/10. Senior Thesis: <i>iOwlT: Sound Geolocalization System</i> (link).	Recife, Brazil 2016–2021

RESEARCH

Detailed information can be found [here](#).

Computing in Memory <i>Harvard University</i> Working on the algorithmic-level to improve efficiency of deep neural network deployment in the crossbar architecture. Particularly interested in reducing bottlenecks such as data conversions, nonidealities, programming time and weight mapping.	2021–PRESENT
iOwlT: Sound Geolocalization System (link) <i>Federal University of Pernambuco</i> Developed a system using neural networks, adaptive filtering and real-time processing in FPGAs to recognize sound events and determine gun shooters location on a mobile application. Earned 3 international awards at InnovateFPGA 2019 in China (Top 0.7%).	2019–2020
Lock-in: Nano-Volt Signal Amplifier (link) <i>Federal University of Pernambuco</i> Design and optimization of a phase-sensitive lock-in amplifier advised by the former Minister of Science and Technology of Brazil Prof. Sergio Rezende to investigate magnetic properties of IrMn/Py thin films using MOKE technique.	2019–2020
iTraffic: Smart Semaphore Network (link) <i>Federal University of Pernambuco</i> Design and proposal of an internet of things intelligent system to dynamically choose traffic lights timing to optimize vehicle flow on urban roads using genetic algorithm. Achieved 130% improvement in the average speed of cars in tested tracks.	2017
Maracatronics: Robotics Team (link) <i>Federal University of Pernambuco</i> Member of the collective autonomous soccer sub-team, acting on robots control on Tiva-C microcontroller, computer vision mapping and tracking, and intelligent robots decision-making strategies. Achieved 5th Place at XVI Latin American Robotics Competition.	2017

PUBLICATIONS

- [2] **Matheus Farias**, H. T. Kung, “A Distribution-Based Efficient Programming of Sorted Compute-in-Memory Crossbars”, *in submission*.
- [1] **Matheus Farias**, H. T. Kung, “Sorted Weight Sectioning for Energy-Efficient DNNs on Compute-in-Memory Crossbars”, *in submission*.

CONFERENCES

2. **2019 International Conference on Field-Programmable Technology** Tianjin, China
1. **VII Brazilian Symposium on Computing Systems Engineering** Curitiba, Brazil

TEACHING

Harvard University

CS205 – *High Performance Computing for Science and Engineering* SPRING 2023

Federal University of Pernambuco

ES456 – *Machine Learning* FALL 2020

MA326 – *Complex Variables and Applications* 2018–2019

FI007 – *Physics II: Gravitation, Waves and Thermodynamics* 2017–2018

MA026 – *Calculus I: Limits, Derivatives and Integrals* FALL 2016

WORK EXPERIENCE

Neurotech

Machine Learning Intern

Served as workshop instructor and collaborated adding +5 machine learning algorithms to production.

Recife, Brazil

2020–2021

Espaço Diferencial

Co-Founder and Teacher

Idealized a non-profit school for underprivileged students in basic engineering classes. Managed the action strategy planning that impacted over 200 students with a team of 10 teachers. Taught Physics at the undergraduate level.

Recife, Brazil

2016–2018

AWARDS AND RECOGNITIONS

MIT Innovator Under 35

Brazil

Title given to top innovators in Science and Technology, I was elected under the artificial intelligence category.

2024

Líder Estudiar Fellow

Brazil

One of the 26 students over 45,000 candidates – the most challenging admission process in the country.

2024

Bronze Medal at the Online Young Physicists' Tournament

Online

8th place at the Online Young Physicists' Tournament 2023.

2023

Silver Medal at the International Young Physicists' Tournament (Physics World Cup)

Murree, Pakistan

2nd place at the 36th International Young Physicists' Tournament 2023 Pakistan.

2023

Behring Foundation Fellowship

Harvard University

Honored by the Behring Foundation with a fellowship to cover my graduate studies at Harvard.

2021–PRESENT

Silver Award at InnovateFPGA 2019 Contest (*Grand Finals*)

Tianjin, China

2nd out of 270 teams with iOwlT: Sound Geolocalization System.

2019

Silver Award at InnovateFPGA 2019 Contest (*Regional Finals*)

Americas

2nd out of 40 teams with iOwlT: Sound Geolocalization System.

2019

Community Award at InnovateFPGA 2019 Contest

Americas

Elected as best project by the community with iOwlT: Sound Geolocalization System.

2019

PIBIC/CNPq funding to do research

Brazil

Awarded by national government funding to do research for Lock-in: Nano-Volt Signal Amplifier.

2019

5th Place at XVI Latin American Robotics Competition <i>Latin America</i> In the Small Size League category of autonomous soccer with Maracatronics: Robotics Project.	2017
1st Place at Embedded Systems Regional Contest <i>Brazil</i> 1st out of 14 teams with iTraffic: Smart Semaphore Network.	2017
Honorable Mention at Brazilian Physics Olympiad <i>Brazil</i> One of the 180 medalists over more than 300,000 contestants.	2015

DIVERSITY, INCLUSION & OUTREACH

• President of Brazil Conference 2025	2024-2025
• Vice President of Brazil Conference 2024	2023-2024
• Brazilian Team Leader at the Online Young Physicists' Tournament	2023
• Brazilian Team Leader at the International Young Physicists' Tournament in Pakistan	2023
• Author of the Experimental Exam for the Brazilian selective to the International Physics Olympiad	2023
• Leader of the Diversity & Inclusion branch at the Harvard Brazilian Association	2022–2023
• Judge for the 4th Brazilian Physicists' Tournament	2021
• Officer of the School of Engineering at the Harvard Brazilian Association	2021–PRESENT
• Judge for the International Young Physicists' Tournament Brazil	2021–2023

TALKS

Futuras Cientistas – Ministry of Science, Technology & Innovation of Brazil (link) <i>Technology and its Social Impact</i>	2023
Federal University of Pernambuco <i>Journey to become a Ph.D student</i>	2022
PodCast Ph.D nos EUA (part 1) (part 2) <i>Journey to become a Ph.D student</i>	2021