Leonardo Mouta Pereira Pinheiro

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EDUCATION

ISAE-SUPAERO   Toulouse, France
Engineering Degree - Aerospace Engineering   *Sep 2020 - Dec 2022*

Aeronautics Institute of Technology (ITA)   Sao Jose dos Campos, Brazil
Bachelor's Degree - Aerospace Engineering   *Jan 2017 - Dec 2022*

Aeronautics Institute of Technology (ITA)   Sao Jose dos Campos, Brazil
Minor Degree - Engineering Physics   *Jul 2019 - Dec 2022*

RESEARCH EXPERIENCE

Laboratory for Analysis and Architecture of Systems (LAAS-CNRS)   France
Research Internship   *Apr 2022 - Sep 2022*

- **Manipulating a cable-suspended object with multiple UAVs**: During my internship at LAAS, my goal was to combine a constraint-based model of an object's movement together with RRT algorithms for path planning. This combination was then used to determine how a fleet of UAVs could cooperatively and autonomously move an object from a starting pose to a goal pose.

Dassault Aviation/ISAE-SUPAERO   France
Joint Research Project   *Aug 2021 - Mar 2022*

- **UAV flight mechanics**: Working in close collaboration with Dassault Aviation, I led a team of students into solving the problem of how to best assess flight dynamic quality - including precision, speed and stability - for multirotor UAVs under various sensor loads.

ISAE-SUPAERO   France
Research Project   *Mar 2021 - Jun 2021*

- **Airborne Collision Avoidance Systems (ACAS) for quadcopters**: In this project I applied new ACAS X technologies, which are based on modeling airborne collisions as Markov decision problems, to the situation of how to determine horizontal resolutions for quadcopters in colliding paths, which resulted in a novel article at my university.

Aeronautics Institute of Technology (ITA)   Brazil
Research Project   *Jul 2019 - Jul 2020*

- **Philosophical approaches to Systems Engineering**: This project consisted of trying to adapt the methodology of "decadialectics", which was developed by Brazilian philosopher Mário Ferreira dos Santos, to the field of Systems Engineering, in order to obtain a more complete view of the relations between a system and its environment.

TECHNICAL WRITINGS

- "Manipulating a cable-suspended object with multiple UAVs and environment contacts in 2D": research internship report at the Laboratory for Analysis and Architecture of Systems (LAAS-CNRS) and senior thesis at both ISAE-SUPAERO (link) and Aeronautics Institute of Technology (ITA) (link)

- "Quantum Computers and Their Effects on Cryptography": thesis for a minor degree in engineering physics at the Aeronautics Institute of Technology (ITA) (link)

- "Horizontal Collision Avoidance Resolutions for Unmanned Quadcopters Using ACAS Xu": final article for research project on ACAS X at ISAE-SUPAERO (link)

SKILLS SUMMARY

- **Programming**: Python, C/C++, Matlab/Simulink, Java, Mathematica, among others

- **Platforms**:   Linux, Windows, ROS, Gazebo, Arduino, PX4, Dassault CATIA, Docker, Git, LaTeX, among others

- **Languages**:   Portuguese (native), English (fluent), French (fluent), Spanish (intermediate), Russian (beginner)

Work/Additional Experience

- **Colégio Olimpo (Middle and High School)** Brazil
  Physics Teacher and Teaching Consultant *Feb 2023 - Aug 2023*
  - **Teaching**: At Colégio Olimpo, one of the best schools in Brazil, I had the honor of teaching physics to the senior high school class that was focused on the ITA/IME admission exams. These exams are extremely rigorous and are usually considered one of the hardest in the world.
  - **Consulting**: As a teaching consultant, I was responsible for writing the physics textbooks to be used by 7th grade students, as well as organizing and teaching special classes, such as rocketry and robotics, for national science Olympiads.

- **Aeronautics Institute of Technology (ITA)** Brazil
  Teaching Assistantships *Jul 2018 - Jul 2020*
  - **Courses**: Introduction to Computing, Differential and Integral Calculus II, Solid Mechanics

- **BOCOM BBM Credit Bank** Brazil
  Summer internship *Jan 2019 - Mar 2019*
  - **Macroeconomics/Quantitative Trading department**: Working between the bank's macroeconomics and quantitative trading departments, I developed tools to predict how the yield of variable-rate bonds indexed by different indicators would convert between each other. The software I developed allowed the bank to trade between differently indexed bonds in an informed manner, thus solving a longtime need.

- **Entrepreneurship League eITA - Aeronautics Institute of Technology (ITA)** Brazil
  Co-founder and Director *Apr 2017 - Jan 2018*
  - **Activities**: The league was conceived in order to help foster an entrepreneurial culture at ITA. To achieve that end, we connected undergraduate and graduate students with several incubators and accelerators, so that their ideas could evolve into becoming sustainable businesses. We also organized outreach events, such as the "Startup Day", and a national startup competition in collaboration with four other universities.

Honors and Awards

- CAPES-BRAFITEC Scholarship - 2021/2022
- Bahia Asset Management Scholarship - 2019
- Weis Award for excellence in teaching - ITA, Brazil - October, 2019. Second student ever to receive this award.
- "Best Student" Award - Reserve Officer's Training Course - December, 2017
- Medals in Scientific Olympiads: 5 Gold, 2 Silver, 2 Bronze