

Rogério Rodrigues Lima

Ph.D. Student in Robotics – WVU

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RESEARCH INTERESTS

Aerial Robotics, State Estimation, Embedded Systems, Artificial Intelligence.

EDUCATION

- | | |
|--------------|---|
| 2020-present | Ph.D. in Aerospace Engineering
Advisor: Guilherme A. S. Pereira.
West Virginia University (WVU), USA. |
| 2010-2013 | M.Sc. in Electrical Engineering
Development of an Embedded Electronic Instrumentation System for UAVs.
Advisor: Leonardo Antônio Borges Tôres.
University of Minas Gerais (UFMG), Brazil. |
| 2005-2009 | B.Sc. in Electrical Engineering
Senior Project: Development of an Inclinator System for Power Line Insulators.
Advisor: Leonardo Antônio Borges Tôres.
University of Minas Gerais (UFMG), Brazil. |
| 1997-1998 | Electrical Technician
Industrial Apprenticeship National Service (SENAI). |

PROFESSIONAL EXPERIENCE

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| 2020-present | Graduate Research Assistant
Field and Aerial Robotics (FARO) Laboratory. Department of Mechanical and Aerospace Engineering, West Virginia University (WVU), USA. https://farolab.wvu.edu/ . |
| 2013-2019 | Lecturer – Engineering Core, University Center of Belo Horizonte (UnibH), Brazil.
Electrical Engineering course. https://www.unibh.br/ |
| 2014-2017 | Consultant and Instructor –
Embedded Systems Consultant at Konatus , Brazil. https://www.konatus.com.br/en . |
| 2013-2014 | System Engineer – Foundation for Technological Innovations (FITec), Brazil. |

- Development and testing of mini-UAVs (10 kg). <https://www.fitec.org.br/>.
- 2011-2012 **Teacher** – Education Institute for the Labor of Minas Gerais (**UTRAMIG**), Brazil.
Mechatronics technical course. <https://utramig.mg.gov.br/>.

PROJECTS

Current Projects

- 2020-present **Autonomous Robotic Early Warning System for Underground Stone Mining Safety**
Sponsor: Alpha Foundation.
Contributions: Design of a tethering system that connects a drone (UAV) to an unmanned ground vehicle (UGV) through a cable to deliver power to the UAV to achieve long endurance missions. The tethering system comprises a sophisticated instrumentation system that controls the tension of the tether whilst reading tether variables (angles, length, tension) required perform the drone localization (secondary task of the tethering system).

Past Projects

- 2010-2013 **Mini-UAVs for Coverage of Areas with Minimization of Time**
Contributions: Design and prototype an electronic instrumentation system for fixed-wing UAVs. Sensors specification, microcontroller and DSP programming, sensor fusion modeling, simulation and implementation on embedded systems.
Funding: Financiadora de Estudos e Projetos (FINEP/Brazil).
- 2018-2019 **Estudo Regionalizado da Ação do Vento no Balanço de Cadeias de Isoladores para Projeto de Coordenação de Isolamento de Linhas Aéreas de Transmissão**
Contributions: Development of an embedded system based on MEMS accelerometers and gyrometers to implement an electronic inclinometer to measure the inclination angle of insulators of aerial power transmission lines.
Funding: CEMIG/ANEEL.

PUBLICATIONS

Total number of publications: 7

Peer-reviewed journal papers (0):

1. **R. R. Lima**, and Guilherme A. S. Pereira. "A Multi-model Framework for Tether-based Drone Localization" JINT (2022) (Under review).

Peer-reviewed papers in international conferences (6):

1. **R. R. Lima** and G. A. S. Pereira, " Drone Collision Detection and Classification using Proprioceptive Data, " 2022 International Conference on Unmanned Aircraft Systems (ICUAS), 2022, pp. 562-569.
2. **R. R. Lima** and G. A. S. Pereira, " On the Development of a Tether-based Drone Localization System, " 2021 International Conference on Unmanned Aircraft Systems (ICUAS), 2021, pp. 195-201.

3. G. S. C. Avellar, G. D. Thums, **R. R. Lima**, P. Iscold, L. A. B. Tôrres and G. A. S. Pereira, " On the development of a small hand-held multi-UAV platform for surveillance and monitoring, " 2013 International Conference on Unmanned Aircraft Systems (ICUAS), 2013, pp. 405-412.
4. **R. R. Lima** and L. A. B. Tôrres, " Performance Evaluation of Attitude Estimation Algorithms in the Design of an AHRS for Fixed Wing UAVs, " 2012 Brazilian Robotics Symposium and Latin American Robotics Symposium, 2012, pp. 255-260.
5. G. S. Ribeiro, **R. R. Lima**, G. A. S. Pereira, L. A. B. Tôrres, L. C. de Araújo Pimenta, "Simulacao Hardware-in-the-loop Aplicada a Avaliacao de Algoritmos de Estimacao de Atitude para VANTS", 2013.
6. M. F. Guimarães, C. A. M. Nascimento, R. M. Valle, G. A. C. França, **R. R. Lima**, and G. A. A. Moreira, "Estudo Regionalizado do Balanço de Cadeias de Isoladores devido à Ação do Vento, " 2008.

Thesis (1):

1. **Rogério Rodrigues Lima**. "Desenvolvimento de uma Cabeça Sensora para Veículos Aéreos Não-Tripulados" M.Sc. thesis, Federal University of Minas Gerais (**UFMG**), 2013. [Link](#) to the thesis (In Portuguese).

HONORS/AWARDS

2020-present	Graduate Research Assistantship. Funding: Alpha Foundation.
2019/06	Honored Lecturer (UniBH)
2018/12	Honored Lecturer (UniBH)
2011-2013	Master's Studies Scholarship. Funding: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).
2007	Undergraduate Research Scholarship. Funding: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

DEVELOPMENT EXPERIENCE

Design of Autonomous Vehicles and Robots (in collaboration with others):

- Tether-powered drone.
- Fixed-wing UAV systems.
- System acquisition and Instrumentation systems.

Software Experience:

- Languages: C/C++, MATLAB, Python.
- Libraries and Tools: Robot Operating System (ROS), Open-source Computer Vision Library (OpenCV). TensorFlow.

- Simulation: Gazebo, Simulink, Spice (OrCAD, LTspice).
- CAD: Solidworks, AutoCAD, Visio, Eagle, Altium.
- Operating Systems: Linux, MS Windows.

UNDERGRADUATE ADVISING

Capstone Projects

- Cristiano Lopes Barbosa and Emerson Junio Costa Thomas, 2019
- Lucas de Sousa Oliveira, 2019
- André Carlos Souza Valadão and Thiago Felipe Andrade Oliveira, 2019
- Glauber Stallone Siqueira and Paulo Henrique Mendes Granja, 2018
- Gleison de Almeida Libério, 2018
- Gabriel da Silva Pinto and Nataniel Nascentes Pereira, 2018
- Rubens Tadeu Gomes dos Reis, 2018
- Alcyberg da Silva and Caio Otaviano do Carmo, 2018
- David José da Silva and Jacqueline Celestina Porto, 2017
- Kleydson Braga Guimarães and Renner Gustavo Ferreira de Oliveira, 2017
- Nathanael Camba Nicholls Sathler, 2017

COMMITTEES

- Capstone Project Committee: 22 students

ROBOTICS COMPETITIONS

- International Conference on Unmanned Aircraft Systems (ICUAS) [Unmanned Aerial Vehicle \(UAV\) Competition](#) (2022). Team Mountaineers' mentor. Virtual/simulated competition motivated by the challenges faced by fire-fighting UAVs. Results: [10th place](#) (no prize).
- [NASA Space Robotics Challenge 2](#) (2020-2021). Team Mountaineers' Testing Lead. Virtual/simulated competition on multi-robot coordination for Lunar exploration and excavation. Results: [6th place](#) (total prize U\$45,000.00).

ORGANIZATION OF KNOWLEDGE TRANSFER EVENTS

- **Line Following Robot Competition** (CompRo) at UniBH, Belo Horizonte, Brazil, November 2017
 - Behind the scenes and the competition: <https://youtu.be/7ijQw3XkiO8>
- **Introduction to Embedded Systems.** University Center of Belo Horizonte (UniBH), Belo Horizonte, Brazil, 2016.
- **Arduino Workshop.** University Center of Belo Horizonte (UniBH), Belo Horizonte, Brazil, 2017.
- **Arduino Workshop.** University Center of Belo Horizonte (UniBH), Belo Horizonte, Brazil, 2018.
- **Arduino Workshop.** University Center of Belo Horizonte (UniBH), Belo Horizonte, Brazil, 2019.

VOLUNTEER

- **AVEC Liga da Robótica** – Free introductory robotic classes for students from 10 to 14 years old of public schools, Belo Horizonte, Brazil, May to November/2019.
 - <https://avecmg.org.br/portfolio-items/liga-da-robotica/>

PRESS COVERAGE

- WVU Press: [WVU Robotics Team Places 6th in Final Round of NASA Centennial Challenge.](#)
- NASA Press: [Teams Develop Code to Coordinate Robots, Win \\$535,000 in Space Robotics Challenge.](#)
- NASA Press: [22 Teams Crack Code, Qualify for Final Stage of NASA Space Robotics.](#)
- WVU Press: [Shooting for the moon: WVU qualifies for final round of NASA Centennial Challenge.](#)

LANGUAGE SKILLS

Portuguese	Native Speaker.
English	Advanced level.
Spanish	Comprehends and reads well.

September 5, 2022