UNIVERSIDADE FEDERAL DE LAVRAS

Master of Science

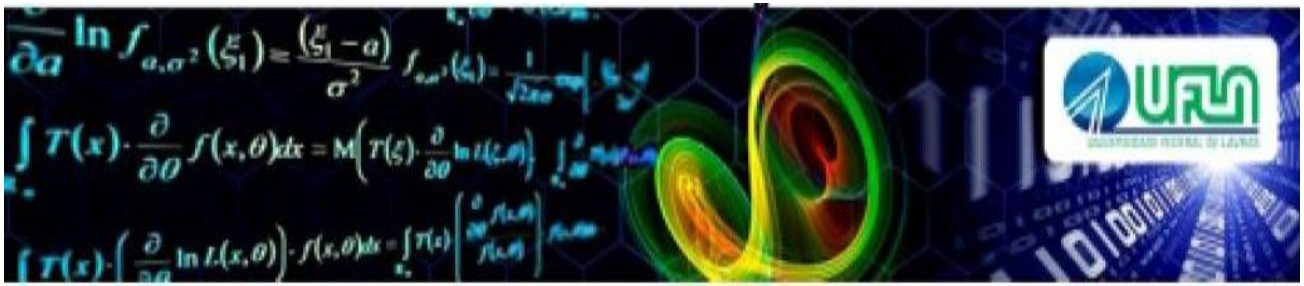
Systems Engineering and Automation

Departament of Automatics

UFLA | School of Engineering

Welcome to PPGESISA

Graduate Program in Systems Engineering and Automation — UFLA



https://sigaa.ufla.br/sigaa/public/programa/apresentacao.jsf?lc=pt_BR&id=1801

Why Graduate Studies Matters

From student to scientist — your journey starts here

You are not here to earn a degree — you are here to create knowledge.

Coordination Team and Social Media

- FELIPE OLIVEIRA E SILVA – COORDINATOR
- BRUNO HENRIQUE GROENNER BARBOSA – DEPUTY COORDINATOR

https://www.instagram.com/ppgesisa/

https://www.facebook.com/ppgesisa.ufla.1

https://www.linkedin.com/in/ppgesisa-ufla-537a4021a/

Systems Engineering and Automation

- Focus on interdisciplinary research on theories, methods, and applications involving modeling, design, implementation, and analysis of physical and virtual systems, e.g. industrial, mechatronic, intelligent, agricultural, and embedded systems.
- Research areas
  - Intelligent Systems
  - Systems Automation and Instrumentation

Intelligent Systems

- Topics
  - Artificial Neural Networks
  - Fuzzy Sets and Systems
  - Evolutionary Computation and Optimization
  - Dynamical Systems Identification and Control
  - Pattern Recognition
  - Numeric Methods
  - Evolutionary Algorithms
  - Embedded Systems

Systems Automation and Instrumentation

- Topics
  - Signal Processing
  - Image Processing and Machine Vision
  - Signal Statistics
  - Pattern Recognition
  - Instrumentation
  - Quality Assessment of Voice and Video Signals
  - Connected and Intelligent Autonomous Vehicles
  - Guidance, Navigation and Control

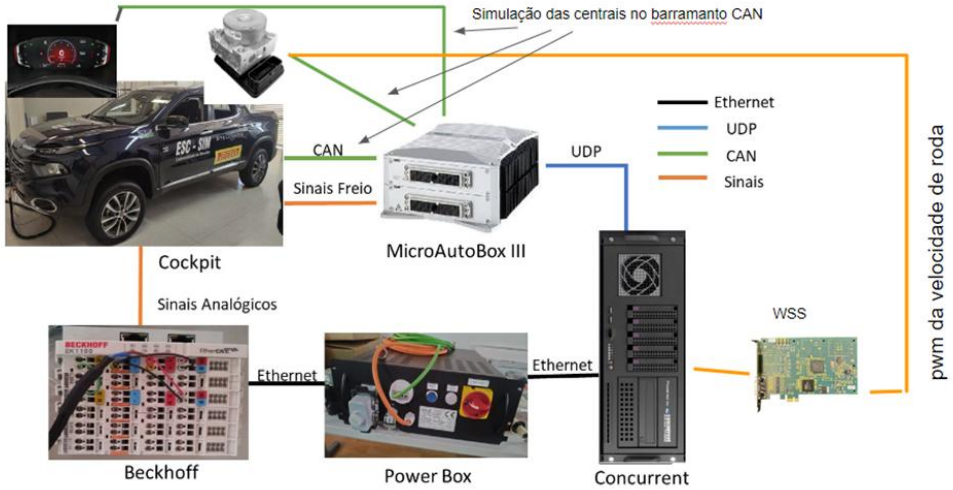
Team

- Intelligent Systems
  - André Murilo de Almeida Pinto (andremurilo@ufla.br)
  - Bruno Henrique Groenner Barbosa (brunohb@ufla.br)
  - Danilo Alves de Lima (danilo.delima@ufla.br)
  - Danton Diego Ferreira (danton@ufla.br)
  - Henrique Luis Moreira Monteiro (henrique.monteiro@ufla.br)
  - Silvia Costa Ferreira (silvia.ferreira@ufla.br)
  - Wilian Soares Lacerda (lacerda@ufla.br)
- Systems Automation and Instrumentation
  - Daniel Augusto Pereira (danielpereira@ufla.br)
  - Demóstenes Z. Rodriguez (demostenes.zegarra@ufla.br)
  - Felipe Oliveira e Silva (felipe.oliveira@ufla.br)
  - Ricardo Rodrigues Magalhães (ricardorm@ufla.br)
  - Sandro Pereira da Silva (sandro.silva@ufla.br)
- Post-docs
  - Carlos Renato Caputo Durão (renatodurao1963@gmail.com)
  - João Paulo de Carvalho Pedroso (joaopaulo.pedroso@ufla.br)
  - Leandro da Silva Camargo (leandrocamargo@ifsul.edu.br)

André Murilo de Almeida Pinto

Doc.: Automatic Control – Grenoble INP (France), 2009
MSc: Automatic Control – Grenoble INP (France), 2006
BEng: Mechatronics Eng. – PUC-MG, 2001

Areas: Model Predictive Control
Optimal and Nonlinar Control
Automotive Control Systems
Hardware-in-the-Loop Applications

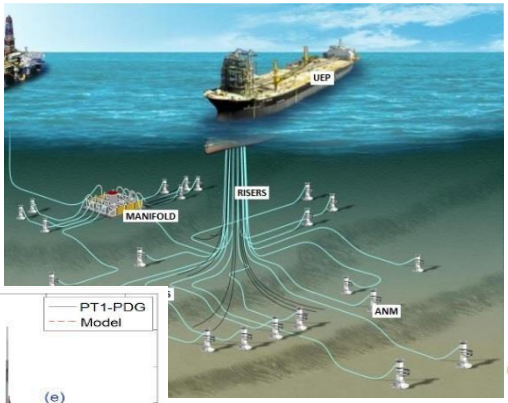


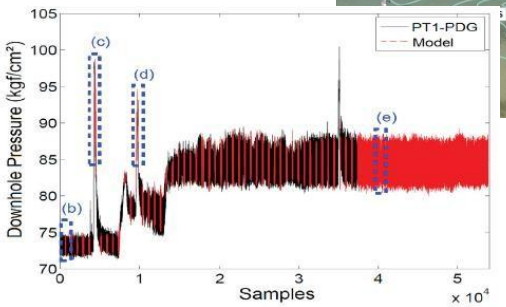
Researchers

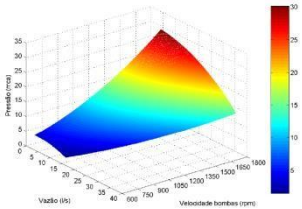
Bruno Henrique Groenner Barbosa

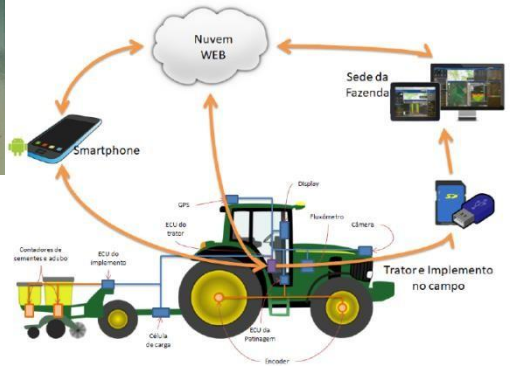
Doc: Electrical Eng. - UFMG, 2009
MSc: Electrical Eng. - UFMG, 2006
BEng: Control and Automation Eng. - UFMG, 2003

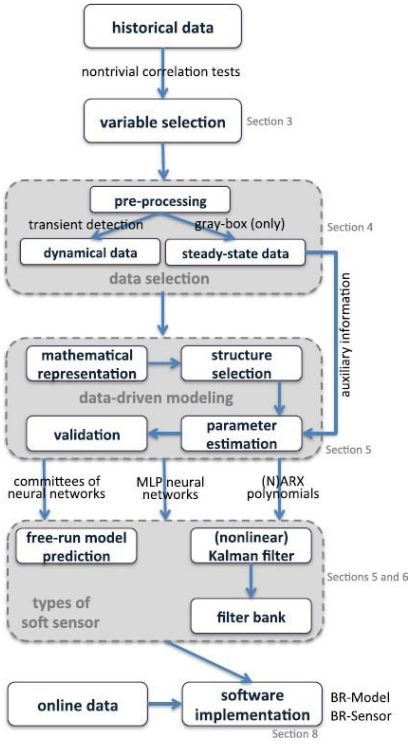
Areas: Modelling of Dynamical Systems and Soft-sensors
Computational Intelligence and Optimization
Pattern Recognition
Systems' Automation



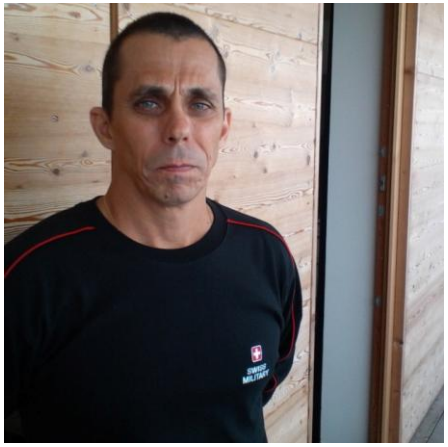








Carlos Renato Caputo Durão (Postdoctoral researcher)

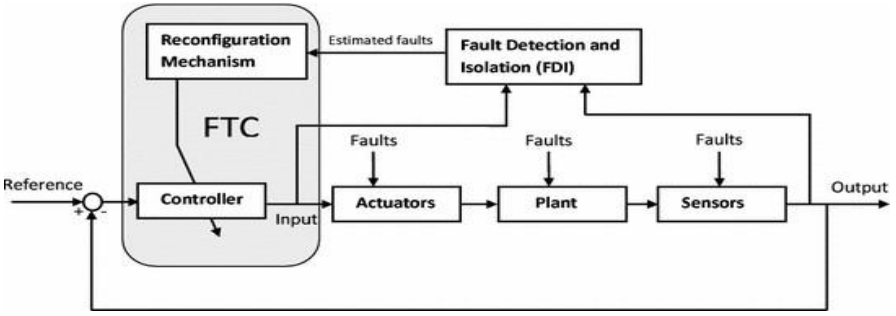


PostDoc.: Systems Engineering and Automation
UFLA, Brazil, 2024–Present
Doc.: Signal Processing– COPPE/UFRJ, Brazil, 2009
MSc.: Control Systems– COPPE/UFRJ, Brazil, 1992
BSc.: Electrical Engineering- UGF, Brasil, 1985

Daniel Augusto Pereira

Post-Doc: Fault Tolerant Control – University of Lille, France, 2017
Doc: Mechanical Eng. – UNICAMP, 2014
MSc: Mechanical Eng. – UNICAMP, 2008
BEng: Automation and Control Eng. – UNICAMP, 2005

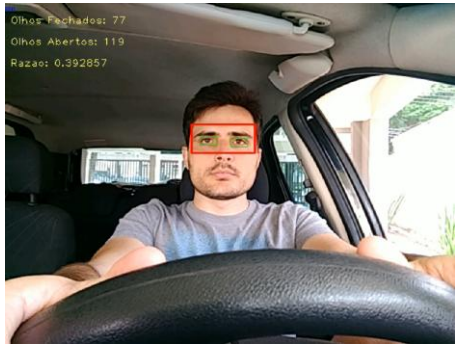
Areas: Control of Dynamical Systems
Fault Diagnosis
Fault Tolerant Control
Active Vibration Control
Structural Health Monitoring



Danilo Alves de Lima

Doc: Information Technologies and Systems – UTC/France, 2015
MSc: Electrical Eng. – UFMG, 2010
BEng: Automation and Control Eng. – UFMG, 2008

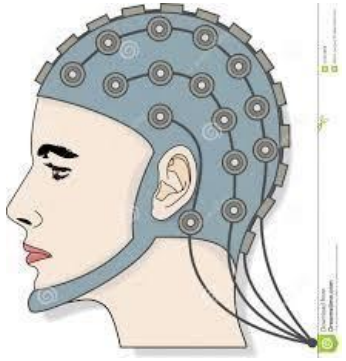
Areas: Intelligent Vehicles Conception
Mobile Robotics
Computer Vision

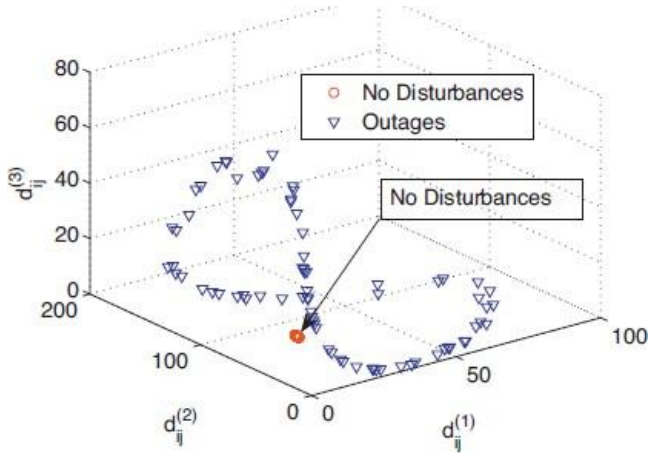


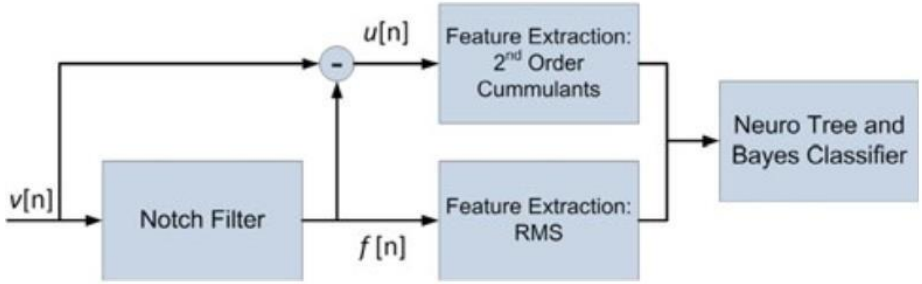
Danton Diego Ferreira

Post-Doc: Signal processing for Smart Grids – UFJF, 2014
Doc: Electrical Eng. - COPPE/Poli/UFRJ, 2010
MSc: Electrical Eng. - UFJF, 2007
BEng: Electrical Eng. - UFSJ, 2000

Areas: Computational Intelligence
Power Quality Monitoring
Biomedical Signals
Pattern Recognition





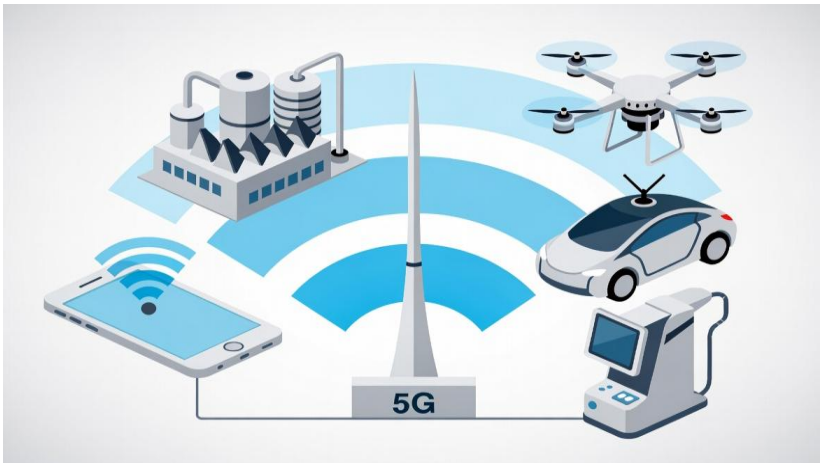


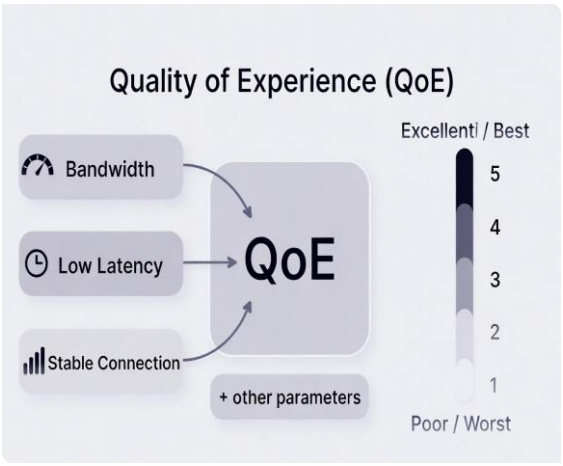
Demóstenes Zegarra Rodríguez

Post-Doc: EP-USP, Brazil (2015) / Q&U Lab – TU of Berlin, Germany (2018) / PPGEE –UFMG, Brazil (2025)

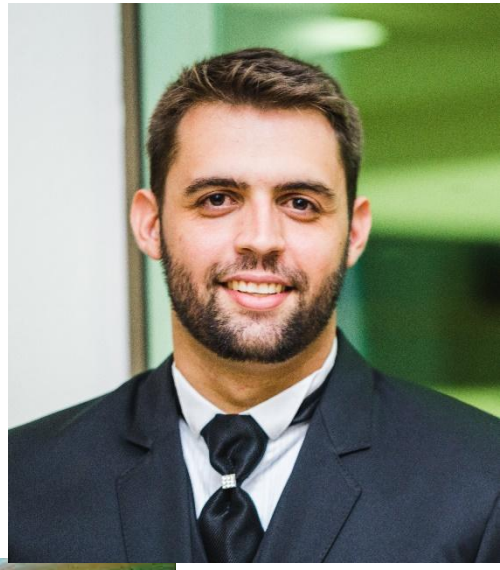
Doc: Electrical Eng. - USP, 2013
MSc: Electrical Eng. - USP, 2009
BEng: Electronic Eng. – PUC/Peru, 2000

Areas: Telecommunication System (5G/6G)
QoE Assessment of Voice and Video Signals
Immersive Technologies (VR/AR)
Artificial Intelligence





Felipe Oliveira e Silva



Post-Doc: Electrical Eng. – UCR, EUA, 2019
D.Sc.: Aeronautical and Mechanical Eng. – ITA, Brazil, 2016
M.Sc.: Systems Eng. – INSA-CVL, France, 2013
B.S.: Automatic Control Eng. – UNIFEI, Brazil, 2012

Research interests:

State Estimation
Stochastic Filtering
Sensor Fusion
Instrumentation
Robotics

Applications:

Guidance, Navigation and Control (GNC)
Inertial Navigation Systems (INS)
Global Navigation Satellite Systems (GNSS)
Connected Autonomous Vehicles (CAV)
Precision Agriculture (PA)

Henrique Luis Moreira Monteiro

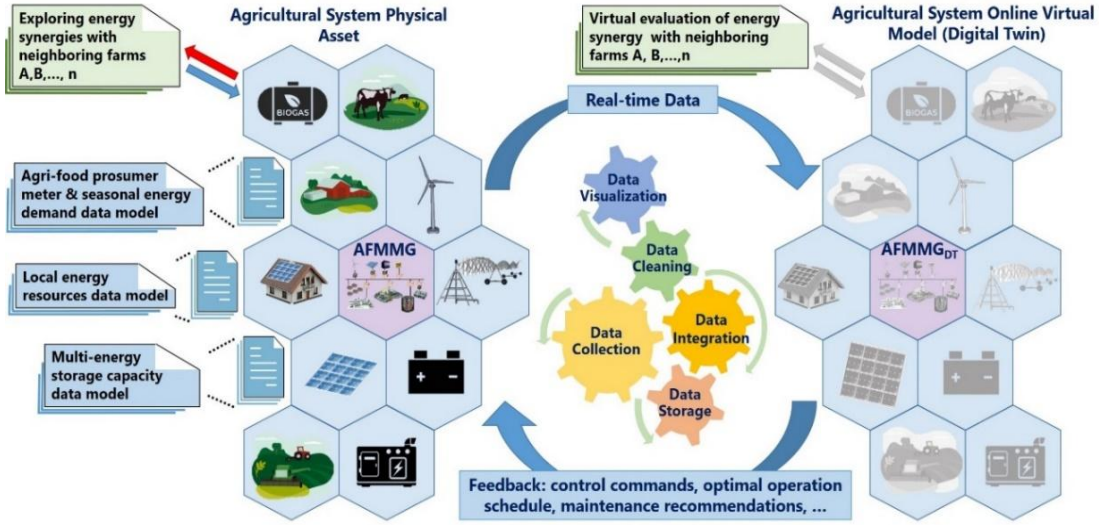
Doc.: Electrical Engineering – UFJF, Brazil, 2018
MSc.: Electrical Engineering – UFJF, Brazil, 2014
BSc.: Electrical Engineering – CES-CL, Brazil, 2010

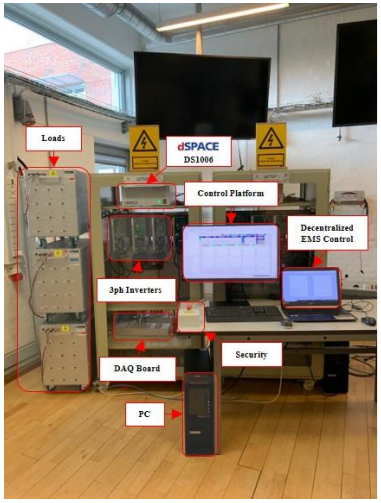
Areas: Internet of Things (IoT) applied in agriculture;
Signal Processing;
Power Quality.

João Paulo de Carvalho Pedroso (Postdoctoral researcher)

Doc.: Agricultural Eng. – UFLA, Brazil, 2025
MSc: System Eng. and Automation – UFLA, Brazil, 2021
BEng: Electrical Eng. – UNILAVRAS, Brazil, 2026
BEng: Hydro Eng. – UNIFEI, Brazil, 2015

Areas: Agricultural Microgrids and Renewable Energy Systems
Digital Twins and Power-Sharing Optmization in Smart Grids
Hierarchical and Distributed Control of Energy Systems
Hardware-in-the-Loop (HIL) Experimentation for Power Electronic Converters

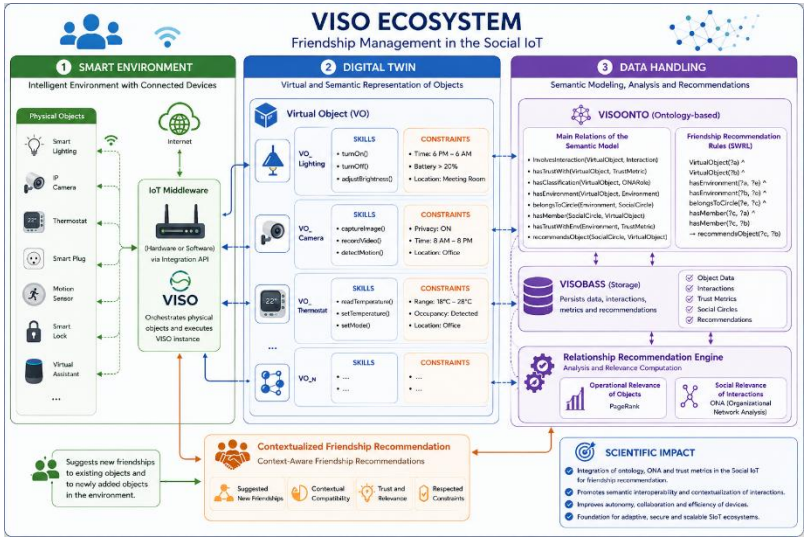


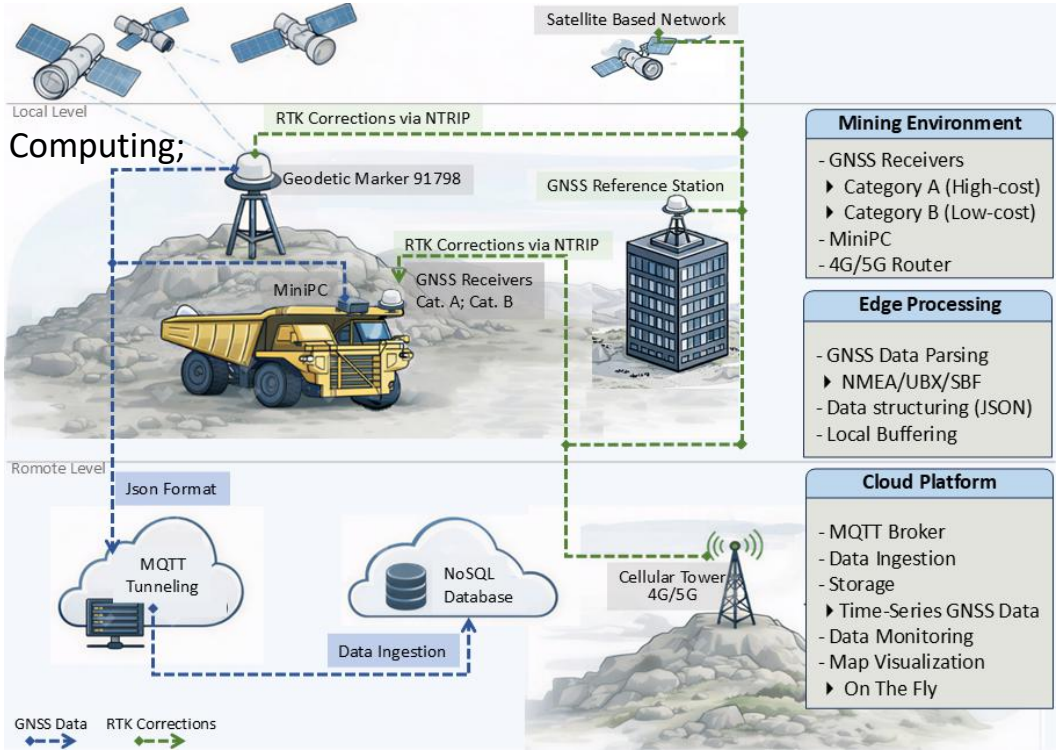


Leandro da Silva Camargo (Postdoctoral researcher)

PostDoc.: Systems Engineering and Automation – UFLA, Brazil, 2024–Present
Doc.: Computer Science – UFPel, Brazil, 2023
MSc.: Applied Computing – UNIPAMPA, Brazil, 2019
BSc.: Informatics – URCAMP, Brazil, 2008

Areas: Social Internet of Things (SIoT);
Digital Twins;
Internet of Things (IoT) and Ubiquitous Computing;
GNSS and Autonomous Systems.





Ricardo Rodrigues Magalhães

Post-Doc: Biomechanics - University of Liverpool, UK, 2014

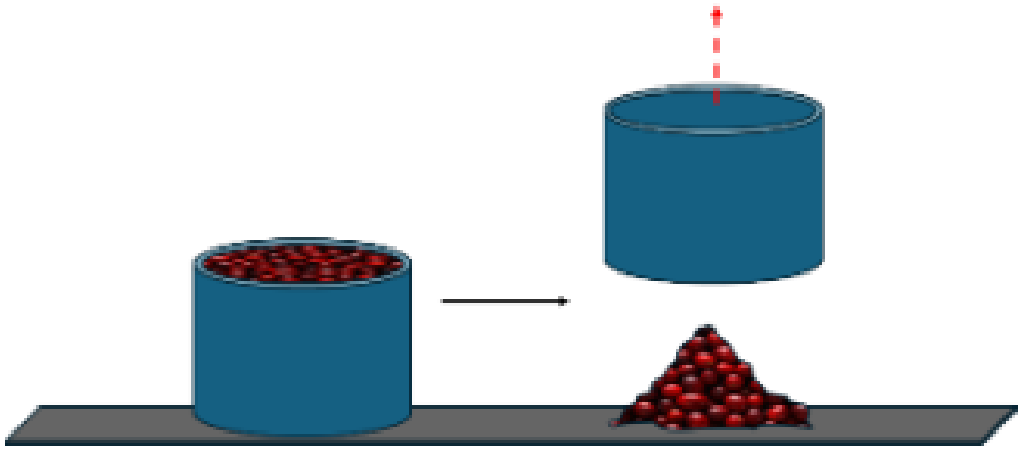
D.Sc.: Industrial Eng - UFBA, 2011

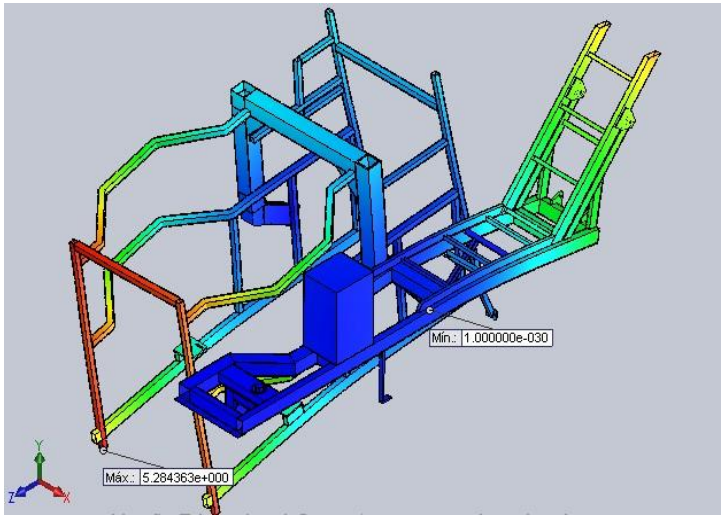
M.Sc : Mechatronics Eng. - UFBA, 2008

B.S.: Mechanical Eng. - CEFET/MG, 2000

Research interests:

- Agricultural processes simulation
- Finite Element Analysis (FEA)
- Discrete Element Method (DEM)





Sandro Pereira da Silva

Doc: Mechanical Eng - USP, 2015
MSc: Mechanical Eng. - UFSJ, 2010
Clinical Psychologist – WC, 2007
MBA: Industrial Management – FGV, 2005
Specialist: Production Management – FEI, 2003
BEng: Civil Eng. – UBSP, 2001
23 years industrial experience of P&D

Areas: Manufacturing Engineering
Process and Product Development
Assistive Technology
Intelligent Equipment Development of Biomedical area

Sílvia Costa Ferreira

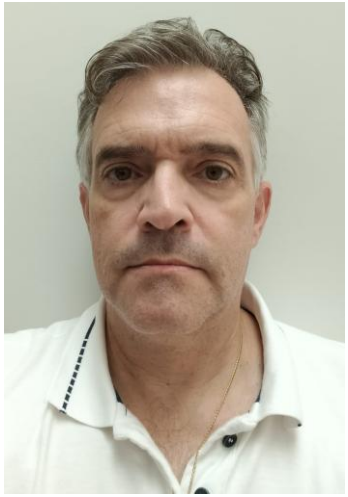
Doc.: Electrical Eng. – UNIFEI, 2016
MSc: Electrical Eng. – UNIFEI, 2012
BEng: Electrical Eng.– UNIFEI, 2011

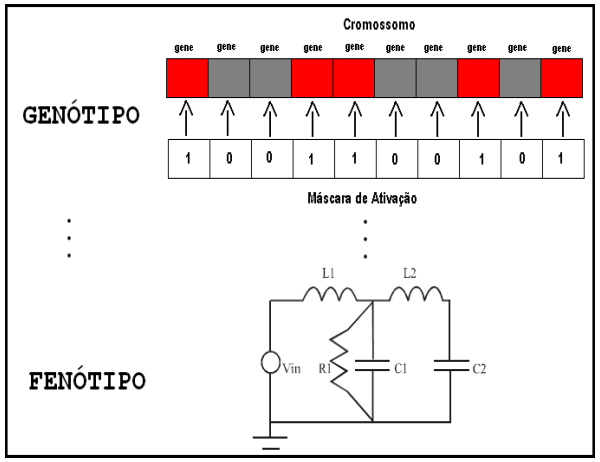
Areas: Power Electonics and Industrial Control
Power Quality and Electric Power Systems
Renewable Energy and Distributed Generation Systems
Microgrids

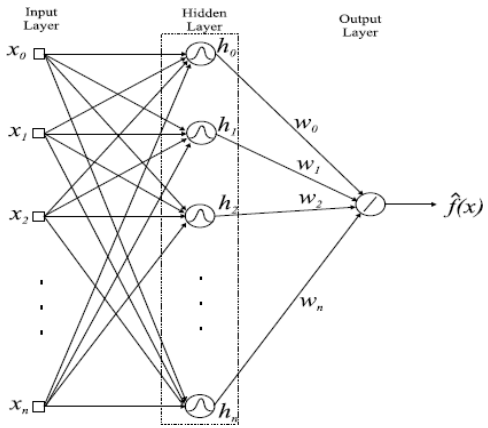
Wilian Soares Lacerda

Doc.: Computer Eng. – UFMG, 2006
MSc: Electrical Eng. – UFMG, 1994
BEng: Electrical Eng. – UFMG, 1991

Areas: Computational Intelligence
Embedded Systems Hardware and Software
Field Programmable Gate Array
Digital and Analogical Electronics







MSc Program Outline

- Usually requires a period of 24 months
- Comprises 30 credits
  - A credit corresponds to 15 hours of class over a 15-week semester – this excludes unsupervised activities
  - Subjects fit into three groups
    - Mandatory (12 credits)
    - Area core (12 credits)
    - Elective (6 credits)

Strategies for the current and next years

- Promote the transition from a master's-only program to a comprehensive graduate program.
- Increase scientific density and the capacity to attract research funding.
- Draft, submit, and approve the proposal (APCN) for the new **Doctoral Program**.
- Significantly increase the proportion of student and faculty publications in high-impact journals (Qualis A / JCR Q1).
- Restructure and deepen research lines to align with doctoral-level requirements.
- Implement rigorous annual monitoring of the national evaluation indicators.
- Institutionalize incentives for writing dissertations and scientific articles in English.
- Systematically include foreign researchers in defense committees and co-supervisions.
- Foster applied research projects with direct integration into the regional and national industry/agribusiness.

Technology Transforming Society

The systems you build will shape how humanity lives, moves, grows food, produces energy, and connects across the world.

Thank you!

Questions
or
suggestions ?