



Fernando Pujaico Rivera

Curriculum Vitae

Personal information

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Google Scholar <https://scholar.google.com/citations?user=wijGLBIAAAAJ>
Web of Science AAW-9842-2020
ResearcherID

Education

- 2025 **PhD in Electrical Engineering**, *Centro Universitário da Fundação Educacional Inaciana Pe. Sabóia de Medeiros*, FEI, Brazil
Title: Body language classification of patients on the bed using deep learning. **Thesis defended: 2025-06-12**
- 2014 **PhD in Electrical Engineering (Telecommunications and Telematics)**, *State University of Campinas*, UNICAMP, Brazil
Title: Bit-Flipping algorithms for joint decoding of correlated sources in noisy channels.
- 2011 **Master's degree in Electrical Engineering (Telecommunications and Telematics)**, *State University of Campinas*, UNICAMP, Brazil
Title: Hard-decision decoding algorithms for LDGM codes.
- 2008 **Electronic Engineer**, *National University of Engineering*, UNI, Peru
Title: Electrical resistivity tomography applied to the study of roots growth.

2006 **Bachelor of science with mention in Electronic Engineering**, *National University of Engineering*, UNI, Peru

Areas of expertise

Electronic engineering, digital signal processing, machine learning, neural networks, error correcting codes, programing, electronic design.

Experience

Teaching experience

Second semester 2019 **PSI528 - Signal processing**, *Engineering Department*, UFLA, Brazil
30 horas

November 2016 **short course: Dynamic Speckle Laser in Bio-systems**, *Entity: Faculty of Agricultural Engineering*, UNICAMP, Brazil
8 hours

Second semester 2015 **PEG530 - Laser, applications and metrology**, *Engineering Department*, UFLA, Brazil
8 hours

Second semester 2013 **Teacher training stage: PED C, GL100**, Mathematics I
Entity: FCA UNICAMP

First semester 2010 **Teacher training stage: PED C, EE881**, Communications principles
Entity: FEEC UNICAMP

2008 **Teacher**, *C++ Language*, Level I
Entity: CCIESAM - UNI. Peru.

Professional experience

2015 – 2020 **Postdoctoral**, *University of Lavras (UFLA)*, Brazil
Engineering department / Applied Instrumentation Development Center to Agriculture (CEDIA)

2007 – 2008 **Researcher**, *Institute for Research and Development of Civil Engineering Faculty (IIFIC)*, UNI, Peru
Type of contract: Labor
Description: Design, construction and data processing of an accelerometer to the Accelerometers National Network of CISMID - II.

2006 – 2008 **Researcher**, *IIFIC*, UNI, Peru
Type of contract: Labor
Description: Design and construction of a data acquisition system for dynamic testing of piles.

Published works

Books

2025 **Samba de gafieira: História, dança, teoria e prática**, ISBN: 978-65-01-47320-8, 1 Ed., Independent edition

<https://trucomanx.github.io/book/gafieira/>

2025 **Métodos numéricos: Problemas não lineares e inversos**, ISBN: 978-65-01-45384-2, 2 Ed., Independent edition

<https://trucomanx.github.io/book/metodos/>

- 2016 **A practical guide to biospeckle laser analysis: theory and software**, ISBN: 978-85-81-27051-7, 1 Ed., Ed. UFLA
<http://repositorio.ufla.br/jspui/handle/1/12119>

Chapters of Books

- 2019 **Engenharias, ciência e tecnologia 4**, ISBN: 978-85-72-47087-2, 2019, Editora Atena
 DOI: 10.22533/at.ed.87219310127

Articles published in magazines

- 2025 **Computers in Biology and Medicine**, DOI: 10.1016/j.combiomed.2025.110350
 Title: "Emotion recognition from facial images, body gestures, and skeletal posture keypoints: The BER2024 dataset".
- 2024 **Theoretical and Applied Engineering**, DOI: 10.31422/taae.v8i3.62
 Title: "Identification of spinal disorders through three-dimensional reconstruction of the human dorsum".
- 2023 **Agriculture**, DOI: 10.3390/agriculture13112077
 Title: "Analysis of the Effect of Tilling and Crop Type on Soil Structure Using 3D Laser Profilometry".
- 2023 **Theoretical and Applied Engineering**, DOI: 10.31422/taae.v7i2.49
 Title: "3d reconstruction system by means of unique camera, structured light and mathematical models".
- 2023 **Smart Agricultural Technology**, DOI: 10.1016/j.atech.2022.100062
 Title: "Optical and Portable Equipment for Characterizing Soil Roughness".
- 2022 **Maderas-Cienc Tecnol**, DOI: 10.4067/s0718-221x2022000100413
 Title: "Particle image velocimetry technique and ultrasound method to obtain the modulus of elasticity of Bertholletia excelsa wood".
- 2022 **Scientia Agricola**, DOI: 10.1590/1678-992X-2020-0297
 Title: "Particle image velocimetry and digital image correlation for determining the elasticity modulus in wood".
- 2021 **Maderas-Cienc Tecnol**, <http://revistas.ubiobio.cl/index.php/MCT/article/view/4860>
 Title: "Particle image velocimetry technique for analysis of retractibility in woods of Pinus elliottii".
- 2020 **Brazilian Journal of Development**, DOI: 10.34117/bjdv6n5-072
 Title: "Use of particle image velocimetry (PIV) to study the modulus of elasticity of plywood panels".
- 2020 **Brazilian Journal of Development**, DOI: 10.34117/bjdv6n5-069
 Title: "Use of the velocimetry technique by particle images (PIV) for the study of deformations in pinus oocarpa wood panels".
- 2020 **Brazilian Journal of Development**, DOI: 10.34117/bjdv6n5-074
 Title: "Use of the Particle Imaging Velocimetry (PIV) technique to obtain the deformation map in Pinus Oocarpa wood panels".
- 2020 **Optics And Laser Technology**, DOI: 10.1016/j.optlastec.2020.106221
 Title: "Illumination dependency in dynamic laser speckle analysis".
- 2019 **Computers and Electronics in Agriculture**, DOI: 10.1016/j.compag.2019.105050
 Title: "Development of an optical technique for characterizing presence of soil surface crusts".
- 2019 **CERNE**, DOI: 10.1590/01047760201925022633
 Title: "Particle image velocimetry for estimating the young's modulus of wood specimens".
- 2019 **Optik**, DOI: 10.1016/j.ijleo.2019.02.055
 Title: "Viability of biospeckle laser in mobile devices".

- 2019 **CERNE**, DOI: 10.1590/01047760201925012619
Title: "Displacement measurement in sawn wood and wood panel beams using particle image velocimetry".
- 2019 **Computers and Electronics in Agriculture**, DOI: 10.1016/j.compag.2019.01.051
Title: "Sound as a qualitative index of speckle laser to monitor biological systems".
- 2018 **Theoretical and Applied Engineering**, DOI: 10.31422/taae.v2i2.5
Title: "The use of particle image velocimetry for displacement measurements in steel columns subjected to buckling".
- 2018 **Optics and Laser Technology**, DOI: 10.1016/j.optlastec.2018.07.006
Title: "Diode laser reliability in dynamic laser speckle application: Stability and signal to noise ratio".
- 2018 **Journal of Food Measurement and Characterization**, DOI: 10.1007/s11694-018-9839-8
Title: "Measurement of water activities of foods at different temperatures using biospeckle laser".
- 2018 **Engenharia Agrícola**, ISSN:0100-6916, DOI: 10.1590/1809-4430-eng.agric.v38n2p159-165/2018
Title: "Analysis of elasticity in woods submitted to the static bending test using the particle image velocimetry (PIV) technique".
- 2017 **Journal of Biomedical Optics**, DOI: 10.1117/1.JBO.22.4.045010
Title: Dynamic laser speckle analyzed considering inhomogeneities in the biological sample.
- 2017 **Optics Communications**, DOI: 10.1016/j.optcom.2017.03.015
Title: Selection of statistical indices in the biospeckle laser analysis regarding filtering actions.
- 2014 **IEEE Communications Letters**, DOI: 10.1109/LCOMM.2014.2377237
Title: Optimal Rate for Joint Source-Channel Coding of Correlated Sources Over Orthogonal Channels.
- [Articles published in annals of events](#)
- 2025 **38th Annual Meeting of the Engineering and Urology Society**, Las Vegas, NV, USA, https://engineering-urology.org/am/38EUS_2025.pdf
Title: Visual explanation of deep learning models for automatic kidney stone detection using multiple ct sources dataset
- 2023 **Workshop de Visão Computacional (WVC)**, Brazil, DOI: 10.5753/wvc.2023.27543
Title: "Posture Pattern Recognition Analysis in Lectures".
- 2022 **LI Congresso Brasileiro de Engenharia Agrícola - CONBEA 2022**, Brazil, <https://conbea.org.br/anais/publicacoes/conbea-2022/livros-2022/geoma-tica-instrumentac-a-o-e-agricultura-de-precisa-o-giap-1>
Title: Equipamento óptico e portátil para caracterizar a rugosidade do solo de área de erosão
- 2019 **Anais do XXVIII Congresso da Pós-Graduação**, Brazil, https://prpg.ufla.br/images/congresso/anais_CPG2019.pdf
Title: Digitalização do dorso humano por meio da visão monocular com projeção de luz estruturada
- 2015 **I Congresso Mineiro de Engenharia e Tecnologia**, Brazil, http://www.eventos.ufla.br/comet/ANAIS_COMET_2015_1ed_FINAL.pdf
Title: "Diferenciação da Crosta Superficial do Solo por Meio de Técnicas Óticas"
- 2013 **XXXI Brazilian Telecommunications Symposium**, Brazil, DOI: 10.14209/sbrt.2013.95, <http://gestao.sbrt.org.br/simposios/artigo/visualizar/a/145>
Title: "Algoritmo Para Decodificação e Fusão De Dados Correlacionados Em Redes De Sensores Sem Fio".

- 2012 **XXX Brazilian Telecommunications Symposium, Brasil**, <http://gestao.sbrt.org.br/simposios/artigo/visualizar/a/432>
Title: "Algoritmos de Decodificação Abrupta para Códigos LDGM".
- 2011 **XXIX Brazilian Telecommunications Symposium, Brasil**
Title: "Decodificação Iterativa Conjunta Fonte-Canal".
- 2007 **XVII National Congress of Engineering, Mechanical, Electrical and Allied, Peru**
Title: "Tomógrafo de Resistividad Eléctrica Aplicado al Estudio del Crecimiento de los Tubérculos de la Papa".

Professor adviser

Joint supervisor

- 2017 **Study of trajectories reconstruction based on low cost inertial sensors and applied to terrestrial mobility context**, *Ribeiro, Eduardo Zampieri*, Master's degree in Systems Engineering and Automation, UFLA
<http://repositorio.ufla.br/handle/1/28225>
- 2016 **Development of an optic technique for characterizing the presence of superficial crust of the soil**, *Barreto, Bianca Batista*, Master's degree in Agricultural Engineering, UFLA
<http://repositorio.ufla.br/jspui/handle/1/11903>
- 2020 **Digitalização da coluna por meio da visão monocular com projeção de luz estruturada**, *Ribeiro, Elisângela*, Phd degree in Agricultural Engineering, UFLA
<http://repositorio.ufla.br/handle/1/43483>
- 2020 **Optical and portable equipment to characterize soil roughness conditions**, *Barreto, Bianca Batista*, Doutorado em Engenharia Agrícola, Universidade Federal de Lavras
<http://repositorio.ufla.br/jspui/handle/1/46056>

Participation in stalls completion work

Doctoral's degree

- 2020 **Digitalização da coluna por meio da visão monocular com projeção de luz estruturada**, *Participation in stalls of Elisângela Ribeiro*, Dissertation defense of post-graduation program agricultural engineering
UFLA. Ordinance PRPG Nro 726/2020 de 14/08/2020.
- 2016 **Digitization of physical deformations of the soil through a digital camera**, *Participation in stalls of Diego Eduardo Costa Coelho*, Dissertation defense of post-graduation program agricultural engineering
UFLA. Ordinance CPGSS/PRPG Nro 987/2016 de 23/11/2016.

Master's degree

- 2017 **Low cost inertial sensor-based trajectory generation: Application in intelligent transport systems**, *Chairman of the stall of Eduardo Zampieri Ribeiro*, Dissertation defense of post-graduation program in system and automation engineering
UFLA. Ordinance CPGSS/PRPG Nro 563/2017 de 11/10/2017.
- 2015 **Influence of laser intensity in the biospeckle activity map**, *Participation in stalls of Renan Oliveira Reis*, Dissertation defense of post-graduation program in system and automation engineering
UFLA. Ordinance CPGSS/PRPG Nro 655/2015 of 13/07/2015.

Doctoral's degree qualification

- 2019 **Participation in the evaluation committee of Elisângela Ribeiro**, Qualification exam of post-graduation program in agricultural engineering
Universidade Federal de Lavras.
- 2019 **Participation in the evaluation committee of Bianca Batista Barreto**, Qualification exam of post-graduation program in agricultural engineering
Universidade Federal de Lavras.
- 2016 **Participation in the evaluation committee of Rodrigo Allan Pereira**, Qualification exam of post-graduation program in agricultural engineering
UFLA.

Master's Degree Qualification

- 2018 **Participation in the evaluation committee of Thiago Juvenal Ribeiro**, Qualification exam of post-graduation program in agricultural engineering
UFLA.
- 2018 **Participation in the evaluation committee of Dione Weverton Dos Reis Araújo**, Qualification exam of post-graduation program in system and automation engineering
UFLA.
- 2016 **Participation in the evaluation committee of Eduardo Zampieri Ribeiro**, Qualification exam of post-graduation program in system and automation engineering
UFLA.

Complementary Training

Complementary Training Courses

- 2020 **Introdução à Ciência da Computação com Python Parte 2**, 7 weeks, <http://coursera.org/verify/DH6VVXCQEBHP>
an online non-credit course authorized by USP and offered through Coursera.
- 2020 **Introdução ao Desenvolvimento de Aplicativos Android**, 5 weeks, <http://coursera.org/verify/N3YXYEYLFT3U>
an online non-credit course authorized by Unicamp and offered through Coursera.
- 2020 **Object detection**, 6 weeks, <http://coursera.org/verify/FQA75P2H8JLS>
an online non-credit course authorized by Universitat Autònoma de Barcelona and offered through Coursera.
- 2020 **Machine Learning**, 11 weeks, <http://coursera.org/verify/TLNHXEJP22ZB>
an online non-credit course authorized by Stanford University and offered through Coursera.
- 2020 **Machine Learning for All**, 20 Horas, <http://coursera.org/verify/CZE8NBUCW87H>
An online non-credit course authorized by University of London and offered through Coursera.

Presentations

- 2013 **Algorithm for decoding and fusion of correlated data in wireless sensor networks**
XXXI Brazilian Telecommunications Symposium, Brazil
- 2012 **Hard-decision decoding algorithms for LDGM codes**
XXX Brazilian Telecommunications Symposium, Brazil
- 2011 **Iterative source-channel joint decoding**
XXIX Brazilian Telecommunications Symposium, Brazil

Languages

Spanish	Native language
Portuguese	Read good, write good, understands good, speak good
English	Read good, Write reasonably, Understands reasonably, Speaks little

Free software projects

- 2015 – Actual **Bio-Speckle Laser Tool Library**, <http://www.nongnu.org/bslt1/>
This package is a set of functions, written in M-code, for the digital processing of images of a bio-speckle analysis. The library is designed to be used in OCTAVE or MATLAB. You can find functions to calculate: Co-occurrence matrix, THSP, AVD, inertia moment, Fujii, GD, PTD, etc.
- 2015 – Actual **PDS-IT Package**, <http://trucomanx.github.io/pdsit-pkg>
This package is a set of functions, written in M-code, for to work with digital signal processing and information theory in OCTAVE or MATLAB. You can find functions for: Entropy for binary sources, Joint entropy for binary sources, bit error rate in the CEO problem, etc.
- 2011 – Actual **PDS Project Library**, <http://www.nongnu.org/pdsplibrary/>
It is a set of libraries, written in C language, for the digital signal processing. You can find libraries for: Random variables, complex numbers, vectors, matrices, FFT, digital filters, digital sources, neural networks, etc.

Computer languages

C	C language
M-code	MATLAB/OCTAVE language
C++	C++ language
Java	Java language
LaTeX	LaTeX language
Python	Linguagem Python
Java/Android	Development of Android applications

Interests

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|------------------|--------------|
| - Photography | - Running |
| - Ocarinas maker | - C language |
| - Dance | - Raw food |