



# Fernando Pujaico Rivera

## Curriculum Vitae

### Personal information

Born Peru - 17 December 1982  
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Curriculum Lattes <http://lattes.cnpq.br/1562723678793624>

### Education

- 2014 **PhD in Electrical Engineering**, *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**, *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**, *UNI*, Peru.

#### Areas of expertise

Electronic engineering, information theory, error correcting codes, programing, electronic design, digital signal processing.

### Experience

#### Teaching experience

- Second semester 2018 **PSI528 - Signal processing**, *Engineering Department, UFLA*, Brazil.  
30 hours
- First semester 2018 **PSI528 - Signal processing**, *Engineering Department, UFLA*, Brazil.  
30 hours

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

- 2016 **A practical guide to biospeckle laser analysis: theory and software**, ISBN: 9-788581-270517, 2016, Ed. UFLA.  
<http://repositorio.ufla.br/jspui/handle/1/12119>

### Chapters of Books

- 2019 **Engenharias, ciência e tecnologia 4**, ISBN: 9788572470872, 2019, Editora Atena.  
DOI:10.22533/at.ed.87219310127

### Articles published in magazines

- 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

- 2015 **I Congresso Mineiro de Engenharia e Tecnologia**, *Brasil*,  
[http://www.eventos.ufla.br/comet/ANAIS\\_COMET\\_2015\\_1ed\\_FINAL.pdf](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*.  
Title: "Algoritmo Para Decodificação e Fusão De Dados Correlacionados Em Redes De Sensores Sem Fio".
- 2012 **XXX Brazilian Telecommunications Symposium**, *Brazil*.  
Title: "Algoritmos de Decodificação Abrupta para Códigos LDGM".
- 2011 **XXIX Brazilian Telecommunications Symposium**, *Brazil*.  
Title: "Decodificação Iterativa Conjunta Fonte-Canal".

#### 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>

#### Participation in stalls completion work

##### Doctoral's degree

- 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.

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#### Free software projects

- 2015 – Actual **Bio-Speckle Laser Tool Library**, <http://www.nongnu.org/bsltl/>.  
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.

- 2014 – Actual **PDS Project Library in Java**, <http://pdsplibj.sourceforge.net/>.  
It is a set of libraries, written in Java language, For the digital signal processing. You can find libraries for: Random variables, vectors, matrices, digital filters, digital sources, particle image velocimetry, etc.
- 2014 – Actual **LDPC Tools**, <https://launchpad.net/ldpc-tools>.  
It is a set of programs, written in C language, for to work with low density parity check matrices.
- 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.
- 2008 – Actual **PIC-GCC Library**, <http://pic-gcc-library.sourceforge.net/>.  
This project implement the utility library and standard C library for the PIC-GCC compiler for micro-controllers PIC of Microchip 16F family.
- 2007 – Actual **Linux Communication**, <http://lnxcomm.sourceforge.net/>.  
It is a library, written in C language, for the communication with the computer serial port.

## 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

## Computer languages

- C C language
- M-code MATLAB/OCTAVE language
- C++ C++ language
- Java Java language
- LaTeX LaTeX language
- Java/Android Development of Android applications - Basic level

## Complementary Training

### Complementary Training Courses

- 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.

## Interests

- Photography
- Running
- Ocarinas maker
- C language

- Dance

- Raw food