Dr. Evelyn GUTIERREZ

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EDUCATION

Université d'Orleans (International Dual Degree), France & Peru
Ph.D. in engineering and informatics (Highest honors)   *Mar. 2019 – Apr. 2023*
Thesis title: *Fusion of thermal and three-dimensional data for chronic wound monitoring*

Pontifical Catholic University of Peru (PUCP), Peru
MSc, Statistics (Highest honors)   *Mar. 2015 – Dec. 2016*
Thesis title: *Estimation of the disease prevalence when diagnostic tests are subject to classification error: Bayesian Approach*

National University of Engineering (UNI), Peru
BSc. in Statistical Engineering   *Aug. 2006 – Dec. 2011*
Placement: First Place

RESEARCH EXPERIENCE

Ph.D. Student, *PRISME Laboratory (France) & LIM Laboratory (Peru), Hybrid*   *Mar. 2019 – Apr. 2023*
I developed an automated process to create thermal 3D models of skin and wound surfaces, with a particular focus on chronic wound assessment. I also researched and implemented quantitative metrics from thermal 3D models for wound evaluation emphasizing the use of low-cost and portable sensors: a smartphone and a commercial low-cost thermal camera.
- Performed data collection and organization of an image database with 4K+ images from 70 patients. Data collection was performed in hospitals in France and Peru.
- Managed the ethical approval process and coordinated closely with Peruvian physicians on data collection.
- Implemented an automated process in Python to fusion thermography with 3D surface models.
- Supervised 5 undergraduate students and 1 Android developer.

Tools: SfM, Meshroom, Meshlab, Python (OpenCV, Open3D, Tensorflow), R (RMarkdown, rgl, Shiny)

Research Engineer, *Medical Image Laboratory (LIM) - PUCP, Lima, Peru*   *Aug. 2019 – October. 2019*
I collaborated in data collection and analysis to study diabetic plantar foot tissue using ultrasound imaging.
- I lead the image collection with a team of 5 in a hospital in Peru: 2 biomedical engineering students, 1 medical technician, and 1 electronic engineer.
- I developed a visualization tool for analyzing and interpreting ultrasound images and associated data.
- I provided support on statistical data analysis and paper writing.

Tools: R, Matlab, Shear Wave Elastography

Research Assistant, *Mathematical and Statistical Modeling for Evaluation - PUCP, Lima, Peru*   *Oct. 2015 – Dec. 2016*
I studied two Bayesian methodologies for improving the estimation of disease prevalence in cases where medical test results are prone to error.
- Implemented Reversible Jump MCMC in R and connected it to C++ to improve the computation speed.
- Analyzed the results using two distinct datasets: a state-of-the-art dataset and a real dataset specifically focused on chronic kidney disease in Peru.

Tools: Bayesian Inference, Computational Statistics, R, C++, High-Performance Computing

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PROFESSIONAL EXPERIENCE

CR Modeling Specialist - Data Scientist, *LenddoEFL, Hybrid from Lima, Peru*   *Mar. 2015 – Oct. 2018*
Developed credit scoring models for financial institutions in Africa, Asia, and Latin America at an international FinTech startup.
- Led end-to-end model development, from data cleaning to production implementation, for 10+ clients across Africa, Asia, and Latin America.
- Leveraged multiple data sources, including psychometric digital questionnaires, geolocation, metadata, and digital presence to target individuals with no credit history.
- Conducted research and development to address data/model issues such as data imbalance, synthetic datasets, model interpretation, integration of new predictive data sources, and model stability out of time.

Tools: R, Python, SQL, PostgreSQL, MongoDB, AWS, Watson IBM

Geointelligence Consulting Analyst, *Business Analytics*, *Lima, Peru*   *Jan. 2014 – Mar. 2015*

Provided Peruvian companies with data-driven insights and researched business opportunities using big data and geolocation information (GIS), including:

- Identified business problems and proposed data-driven solutions.
- Performed GIS data analysis and geomarketing studies to create customer profiles.
- Performed analysis on retail distribution systems to evaluate market potential, cannibalization, and competitor studies.

Tools: R, Statistica, ArcGIS, PostgreSQL, SQL, Azure ML, QGIS

Data Analyst, *Entrepreneurial Finance Lab (EFL)*, *Lima, Peru*   *Sep. 2011 – Dec. 2013*

Performed data analysis and engineering at a Harvard Spin-off FinTech startup. Highlighted contribution:

- In charge of the implementation of 5+ psychometric assessments on the web for online data collection.
- Created and managed a Data Warehouse.
- Conducted ad-hoc data analysis for R&D, and developed reporting tools.
- Automated the data pipelines.

Tools: Stata, R, VBA Excel, C++

TEACHING

Part-time Lecturer, *Pontifical Catholic University of Peru (PUCP)*, *Lima, Peru*   *2017 - 2023*

Taught more than 200h teaching in undergraduate courses. I also provided assistance in postgraduate courses.

- Undergraduate:
  - (1EST12) Applied Statistics, (EST218) Statistics for Engineering
  - (EST103) Statistics for General Studies in Humanities, (EST145) Statistics for General Studies in Science,
  - (1INF07) Numerical Experimentation
- Postgraduate courses:
  - Regression, and Time Series (12h)
  - Inference and Applied Statistics using R (24h)
  - Basic statistical methods with R and SPSS (20h)
  - Statistical Learning: SVM and GBM (12h)

Instructor, *National University of Engineering (UNI)*, *Lima, Peru*   *2020 - 2023*

- Taught short courses for the Business Intelligence and Data Analytics Program:
  - RMarkdown workshop (8h);
  - Advanced data analytics: Dashboards with flexdashboard, data balancing, and missing data (12h).

PUBLICATIONS

Journals:

- Naemi, R., Romero Gutierrez, S.E., Allan, D., Flores, G., Ormaechea, J., **Gutierrez, E.**, Casado-Pena, J., Anyosa-Zavaleta, S., Juarez, M., Casado, F., Castaneda Aphan, B., *Diabetes Status is Associated With Plantar Soft Tissue Stiffness Measured Using Ultrasound Reverberant Shear Wave Elastography Approach.* J Diabetes Sci Technol. 16, 478–490 (2022), doi: 10.1177/1932296820965259.
- **Gutierrez, E.**, Castañeda, B., Treuillet, S., Hernandez, I.: *Multimodal and Multiview Wound Monitoring with Mobile Devices*. Photonics. 8, 424 (2021), doi: 10.3390/photonics8100424
- Romero, S.E., Naemi, R., Flores, G., Allan, D., Ormachea, J., **Gutierrez, E.**, Casado, F.L., Castaneda, B., Plantar Soft Tissue Characterization Using Reverberant Shear Wave Elastography: A Proof-of-Concept Study. Ultrasound in Medicine Biology 48, 35–46, (2021), doi: 10.1016/j.ultrasmedbio.2021.09.011
- Niri, R. and **Gutierrez, E.** and Douzi, H. and Lucas, Y. and Treuillet, S. and Castaneda, B. and Hernandez, I., *Multi-View Data Augmentation to Improve Wound Segmentation on 3D Surface Model by Deep Learning*, in IEEE Access, vol. 9, pp. 157628-157638, (2021), doi: 10.1109/ACCESS.2021.3130784

Conferences:

- **Gutierrez, E.**, Castañeda B., Treuillet S, (June, 2023) *Registration of thermal 3D models over time using low cost and portable devices*, Quality Control by Artificial Vision QCAV, Albi-France.
- **Gutierrez, E.**, Castañeda B., Treuillet S., and Lucas Y. (February, 2021)*Combined thermal and color 3D model for wound evaluation from handheld devices*, Proc. SPIE 11601, Medical Imaging 2021: Imaging Informatics for Healthcare, Research, and Applications, 1160108, doi: 10.1117/12.2580669
- **Gutierrez, E.**, Castañeda B., Treuillet S, (February, 2020) *Correction of Temperature Estimated from a Low-Cost Handheld Infrared Camera for Clinical Monitoring*, Advanced Concepts for Intelligent Vision Systems (Vol. 12002, pp. 108–116). Springer International Publishing, doi: https://doi.org/10.1007/978-3-030-40605-9_10
- **Gutierrez, E.** (August, 2019) *Estimation of the disease prevalence when diagnostic tests are subject to classification error: Bayesian approach*, Latin American Bayesian Congress (COBAL), Lima-Peru

TECHNICAL SKILLS & OTHERS

Statistics: Probability, Experimental Design, Generalized Linear Models, Computational Statistics.
Machine Learning: Supervised and Unsupervised Learning, Ensemble Methods.
Computer Vision: Camera Calibration, 3D modeling, Structure from Motion, SLAM, Deep Learning.
Programming: Excellent in Python and R. Proficient in C++, SQL, Stata, and VBA.

VOLUNTEERING

Co-organizer, *RLadies Lima*, *Peru*   *2018 - 2021*
I organized events to promote science and tech in women and to discuss and share experiences on using R.
RLadies Lima is part of a worldwide organization to promote gender diversity in the R community.

SCHOLARSHIPS AND AWARDS

- **2020 - Paul Rivet Scholarship:** Awarded from the European Commission, French Government and the Catholic University of Peru, for international mobility between France and Peru.
- **2016 - Graduate Student Research PAIP:** Research grant awarded by the Graduate Student Research Support Program (PAIP2016) at the Catholic University of Peru in support of my master research project.
- **2010 - Pardo and Lavalle Award**: Price awarded by National University of Engineering (Peru) for first place in the Statistical Engineering Program.

LANGUAGES

Spanish (Native); English (Professional working Proficiency); French (Advanced C1).

REFERENCES

Dr. Benjamin Castaneda	**Dr. Sylvie Treuillet**	**Dr. Giancarlo Sal y Rosas**
Principal Professor	Associate Professor	Principal Professor
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