

# Miguel López Pérez

PHD · MACHINE LEARNING

Google Scholar: <https://scholar.google.es/citations?user=MK-LiQoAAAAJ&hl=es&oi=ao>

✉ mlopez@decsai.ugr.es | 🏠 wizmik12.netlify.app | 📧 wizmik12 | 🐦 @wizmik12

## Education

---

### University of Granada

Granada (Spain)

#### PH. D. COMPUTER SCIENCE

2018 - 2022

- Title: Probabilistic Methods for Image and Signal Classification. Applications to Medicine and Volcanology.
- Advisor: Prof. Rafael Molina.
- Co-advisor: Prof. Aggelos K. Katsaggelos.
- International Mention
- Grade: Outstanding (Sobresaliente) Cum Laude

### University of Granada

Granada (Spain)

#### MSc. IN DATA SCIENCE

2017-2018

- Final project: Image restoration using deep learning.
- Average grade: Average grade: 8.89/10 (outstanding mention in 1/13 courses).

### University of Granada

Granada (Spain)

#### BSc. IN MATHEMATICS

2012-2017

- Final project: Lax-Milgram theorem: origin, generalizations, and applications.
- Average grade: 7.36/10 (outstanding mention in 2/38 courses).

## Visits

---

### Northwestern University

Evanston, IL (USA)

#### VISITING PH.D. STUDENT

2021

- Dates (1 month): 14/11/2021 – 16/12/2021
- Invited by Prof. Aggelos K. Katsaggelos to continue the work on crowdsourcing in digital pathology started in the last visit.
- Funding: Visiting Scholar project.

### University of Valencia

Valencia (Spain)

#### VISITING PH.D. STUDENT

2020

- Dates (1 month): 05/02/2020 – 01/03/2020
- Invited by Prof. Camps-Valls to study crowdsourcing methods apply to Remote Sensing.
- Funding: KERMES network.

### Northwestern University

Evanston, IL (USA)

#### VISITING PH.D. STUDENT

2019

- Dates (2 months): 27/09/2019 – 28/11/2019
- Invited by Prof. Aggelos K. Katsaggelos to work on crowdsourcing in digital pathology.
- Funding: Visiting Scholar project.

## Professional Experience

---

### University of Granada

Granada (Spain)

#### PHD RESEARCHER

2022-present

- Dates: 13/07/2022 – present
- AI for cutaneous spindle cell neoplasm histopathological diagnosis project.

### University of Granada

Granada (Spain)

#### PHD STUDENT RESEARCHER

2021-2022

- Dates: 01/01/2021 – 12/07/2022
- AI for cutaneous spindle cell neoplasm histopathological diagnosis project.

- Dates: 01/07/2018 – 31/12/2020
- Enhancement, classification and interpretation of cancer histological images project.

## Publications

---

### JOURNAL

- M. López-Pérez**, A. Schmidt, Y. Wu, R. Molina, and A.K. Katsaggelos, “Deep Gaussian Processes for Multiple Instance Learning: Application to CT Intracranial Hemorrhage Detection”, *Computer Methods and Programs in Biomedicine*, vol. 219, 106783, June 2022.
- M. López-Pérez**, M. Amgad, P. Morales-Álvarez, P. Ruiz, L.A.D. Cooper, R. Molina, and A.K. Katsaggelos, “Learning from crowds in digital pathology using scalable variational Gaussian processes”, *Scientific Reports*, vol. (2021) 11:11612, 2021.
- M. López-Pérez**, L. García, C. Benítez, and R. Molina, “A Contribution to Deep Learning Approaches for Automatic Classification of Volcano-Seismic Events: Deep Gaussian Processes”, *IEEE Transactions on Geoscience and Remote Sensing*, vol. 59, no. 5, 3875 - 3890, May 2021.
- F. Pérez-Bueno, **M. López-Pérez**, M. Vega, J. Mateos, V. Naranjo, R. Molina, and A.K. Katsaggelos. A TV-based Image Processing Framework for Blind Color Deconvolution and Classification of Histological Images. *Digital Signal Processing*, vol. 101, no. 6, 102727, June 2020
- A. E. Esteban\*, **M. López-Pérez**\*, A. Colomer, M. A. Sales, R. Molina, and V. Naranjo A New Optical Density Granulometry-Based Descriptor for the Classification of Prostate Histological Images Using Shallow and Deep Gaussian Processes. *Computer Methods and Programs in Biomedicine*, vol. 178, 303-317, September 2019.

### CONFERENCE

- M. López-Pérez**, R. Molina, and A. K. Katsaggelos. Métodos probabilísticos para la detección automática de cáncer en imágenes histológicas - III Congreso Nacional, V Jornadas JIFFI, June 2022.
- M. López-Pérez**, A. Colomer, M. A. Sales, R. Molina, and V. Naranjo. Classifying Prostate Histological Images Using Deep Gaussian Processes on a New Optical Density Granulometry-Based Descriptor in Intelligent Data Engineering and Automated Learning - IDEAL 2019, edited by Springer International Publishing, Manchester (United Kingdom), November 2019.

\* Equal contribution

## Awards

---

- 2022 **Best poster**, CITIC Coffee - Poster session (University of Granada).
- 2022 **Best production in podcasting**, Radiolab UGR (University of Granada).
- 2020 **II Enigma contest**, Science Faculty (University of Granada).
- 2018 **Best research project**, Impaciencia contest (University of Málaga).  
**Best scientific dissemination project**, Impaciencia contest (University of Málaga).

## Presentations

---

### TALKS

- October 2017. *A mathematical vision of the Alhambra* in II Jornada RSME-AMAT, Institute of Mathematics of the University of Granada.
- November 2017. *The Lax-Milgram's theorem: Origin, generalizations and applications* in end of degree thesis contest RSME-UGR, Institute of Mathematics of the University of Granada
- March 2018. *The Open Bacteria Project* in Launch of Facultad Cero, Faculty of Political Sciences of University of Granada.

April 2018. *Open space of disruptive educational experiences* in I Jornadas de Transferencia y Emprendimiento Social, Education Faculty in University of Granada.

June 2018. *The Open Bacteria Project* in Bioinformatics GRX seminars, University of Granada.

March 2019. *The Fluxions: Live podcast* in III Jornada RSME-AMAT, Institute of Mathematics of the University of Granada

April 2019. *Artificial intelligence: your face is similar to it* in JASYP, Computer Engineering School of University of Granada.

June 2019. *Gutting Keras* in EsLibre, Computer Engineering School of University of Granada.

November 2019. *Introduction to Gaussian Processes* in Lab Meeting of IVPL, Northwestern University.

October 2020. *EDA and NLP basics: Exploring the innards of the Spanish poetry* in PyConEs, online.

February 2021. *Can mathematics save your life?* in semifinal of 3 Minute Thesis of University of Granada, online.

April 2022. *Can Artificial Intelligence know when it is wrong?* in Aquí Te Pillo, Aquí Te Cuento, La Tertulia, Granada.

## WORKSHOPS

April 2015. *The maths of Rubik's cube, basic and advanced introduction for its resolution*, Asgran association.

March 2017. *Origami and Mathematics: Theorems that are hidden behind a sheet of paper*. I Jornada RSME-AMAT. Faculty of Science of University of Granada.

May 2017. *A mathematical look at magic and the bubbles of soap*. Science fair of Parque de las Ciencias.

## Mentoring

---

**Alberto Díaz-Malaguilla Puntas**, Development of classification models for histological images based on crowdsourcing techniques, Co-advisor, University of Granada, <https://digibug.ugr.es/handle/10481/69597>.

## Research Experience

---

### **Automatic detection and grading of prostate cancer from non-expert annotators.**

FUNDED BY THE ANDALUSIAN GOVERNMENT WITH 124.950€.

2020-2023

- My PhD advisor is the PI.
- I am an official working member of the team: 2021-2023.

### **AI for cutaneous spindle cell neoplasm histopathological diagnosis.**

FUNDED BY THE SPANISH GOVERNMENT WITH 203.522€.

2020-2023

- My PhD advisor is the PI.
- I am an official working member of the team: 2020-2023.
- I am hired by this project: 2021-present.

### **Cloud ARTificial Intelligence For pathology (CLARIFY)**

H2020-MSCA-ITN-2019 FUNDED BY THE EU WITH 231.321,52€.

2019-2023

- My PhD advisor is the PI in Granada.
- I am an official working member of team: 2019-2023
- I was in the organization committee of the second school training school in Granada.

### **Visiting Scholars**

FUNDED BY THE UNIVERSITY OF GRANADA WITH 10.000€.

2018-2021

- My PhD advisor is the PI in Granada.
- I am an official research member of team: 2018-2021.
- I have conducted several research papers in collaboration with Northwestern University.
- I made two visits to Northwestern University.

## Enhancement, classification and interpretation of cancer histological images.

FUNDED BY THE SPANISH GOVERNMENT WITH 145.200€.

2017 – 2020

- My PhD advisor is the PI.
- I am an official working member of the team: 2018-2020.
- I was hired by this project: 2018-2020.

## Other selected merits

---

### CERTIFICATES

June 2012. First Certificate of English (B2 level) by Cambridge University.

### COURSES

October-November 2015. Basic Arduino. University of Granada, online.

April-May 2016. Data Science: A Practical Approach in the Age of Big Data, Centro Mediterráneo.

May 2016. Latex Course, Faculty of Science of University of Granada.

April-May 2016. Data Science and Big Data seminars, Faculty of Science of University of Granada.

April 2017. Jornada conjunta IEMATH-GR/RSME, Institute of Mathematics of University of Granada.

September 2019. Summer School of Gaussian Processes and Uncertainty Quantification, University of Sheffield.

January 2020. Writing a research paper in English: strategies and techniques, University of Granada.

September 2020. IEEE Author's Workshop, online.

February 2021. Jornadas de Bioinformática, Faculty of Science of University of Granada.

March 2021. Scientific career and elaboration of research projects, University of Granada, online.

April 2022. Second training school Clarify, University of Granada.

### HACKATONS

October 2015. Todos incluidos by Telefónica.

February 2018. Hashcode by Google.

### CONFERENCE ORGANIZATION

April 2022 **Second Clarify training school**, Travel management and technical resources assistant.

*Granada*

### PERSONAL PROJECTS

2022- **Aquí te pillo, aquí te cuento. Live event of science**, Organizer.

*Granada*

2021- **Scenio. Science organization**, Member and collaborator.

*Spain*

2018- **The Fluxions. Podcast of science.** <https://thefluxions.github.io/>, Member.

*Granada*

2017-2018 **The Open Bacteria Project.** <https://github.com/TheOpenBacteriaProject>, Member.

*Granada*

### LANGUAGES

Spanish: native; English: advanced.

### PROGRAMMING LANGUAGES

Tensorflow (GPflow), Pytorch (GPytorch), Python (Numpy, Pandas), Matlab, R, C++.

### PEER REVIEW

Computer Methods and Programs in Biomedicine Update

Digital Signal Processing

Expert Systems with Applications