

# Javier Maroto Morales

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## ABOUT ME

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I have a PhD in Machine Learning from EPFL. I have 2+ years of consulting experience with top Spanish clients, in which I developed Big Data solutions with Azure and pySpark. I am currently pursuing Data Scientist and Software Developer roles to apply my skills and make a bigger impact in the industry.

## WORK EXPERIENCE

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### Doctoral Researcher

**September 2019 – April 2024**

École Polytechnique Fédérale de Lausanne (EPFL)

Lausanne, Switzerland

- Worked for armasuisse Science & Technology in a 4-years collaboration with their team of engineers.
- Designed and implemented frameworks in Pytorch and JAX for improving the robustness of neural networks against adversarial perturbations by leveraging inherent data properties, outperforming state-of-the-art robust neural networks.
  - Published 4 papers in leading machine learning conferences.
  - Used adversarial training, knowledge distillation, and generative AI with diffusion models.
  - Applied these frameworks to computer vision and wireless communications.
- Lead projects on NLP (LLMs) and federated learning and attended Machine Learning optimization courses
- Implemented autoencoder models in Pytorch that improve over state-of-the-art in recommender systems

### Data Analyst

**July 2017 – April 2019**

Kernel Analytics (currently part of BCG X)

Barcelona, Spain

- Conducted customer intelligence analyses, including predicting customer lifetime value and churn rates, using advanced analytics to drive strategic decision-making in retail. Developed and deployed cohort analysis tools in PowerBI to enhance customer segmentation.
- Designed and implemented an ETL with Azure Data Warehouse, integrating data from the company's e-commerce and offline stores, streamlining data access and improving business intelligence capabilities.
- Created a product similarity visualization tool using Shiny, enabling users to interact with a pruned scatter plot that displays product similarities based on proximity, facilitating better product comparisons.
- Implemented an NLP model to classify product descriptions into appropriate categories, enhancing product categorization accuracy in the retail sector.
- Used CNNs for financial services to locate and recognize handwritten text in scanned documents, and designed a model for accurate document type identification, improving document processing efficiency.

### Research Intern

**January 2017 – June 2017**

University of Southern California (USC)

Los Angeles, CA

- Designed a novel active learning algorithm to enhance task learning on crowdsourced labeled data by leveraging smoothness in graph signal processing theory.
  - Published a paper in ICASSP.

### Data Analyst Internship

**June 2016 – August 2016**

Kernel Analytics (currently part of BCG X)

Barcelona, Spain

- Performed data analysis to identify key insights and metrics using Python and R.

## EDUCATION

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École Polytechnique Fédérale de Lausanne (EPFL)

PhD in Machine Learning

April, 2024

Lausanne, Switzerland

Universitat Politècnica de Catalunya (UPC)

BSc in Telecommunications Engineering and Physics Engineering (double degree)

June, 2017

Barcelona, Spain

- Studied abroad in Los Angeles, CA during the spring semester of 2017 (USC)
- Awarded CFIS scholarship (top 40 Spanish students each year)

## SKILLS

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- **Programming languages:** Python, R, MatLab, Java
- **Deep Learning Frameworks:** Pytorch, JAX, tensorflow
- **Data Engineering:** Azure Cloud Computing (DW, DL, DF, Databricks), ETL, SQL, PySpark
- **Business Intelligence:** Power BI, R Markdown, LaTeX, Shiny, plotly
- **Miscellaneous:** Unix, git, docker, Jira, Agile
- **Language skills:** Spanish – Native, English – Fluent, French – Intermediate, German – Beginner

## PUBLICATIONS

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1. **J. Maroto** and P. Frossard. "PUMA: margin-based data pruning for better accuracy-robustness trade-offs". Under review. arxiv:2405.06298 (2024)
2. **J. Maroto**, G. Bovet, and P. Frossard. "Maximum Likelihood Distillation for Robust Modulation Classification". IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (2023).
3. **J. Maroto**, G. Bovet, and P. Frossard. "SafeAMC: Adversarial Training for Robust Modulation Classification Models". European Signal Processing Conference (EUSIPCO) (2022).
4. **J. Maroto**, G. Ortiz-Jiménez, and P. Frossard. "On the Benefits of Knowledge Distillation for Adversarial Robustness". Under review. arXiv:2203.07159 (2022).
5. M. O. Mendonça, **J. Maroto**, P. Frossard, and P. S. Diniz. "Adversarial Training with Informed Data Selection". European Signal Processing Conference (EUSIPCO) (2022).
6. **J. Maroto**, G. Bovet, and P. Frossard. "On the Benefits of Robust Models in Modulation Recognition". SPIE Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications (2021).
7. **J. Maroto**, C. Vignac, and P. Frossard. "Modurec: Recommender Systems with Feature and Time Modulation". IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (2021).
8. **J. Maroto** and A. Ortega. "Efficient Worker Assignment in Crowdsourced Data Labeling using Graph Signal Processing". IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (2018).

## AWARDS

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- 5th place in IEEE-ISBI challenge (2018): worked with DICOM images from 3D sequential CT scans
- 3rd place in Local Mathematical Olympiad and 4th Place in Local Physics Olympiad (2012)
- 2nd place in Local Mathematical Olympiad (2011)

## PERSONAL INTERESTS

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Playing piano, composing music, cooking, skiing, tinkering with a UNIX server, and learning in general.