






# Guillermo Ortiz-Jiménez



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## About me

I am a **PhD student at EPFL** working under the supervision of Prof. Pascal Frossard. My current research focuses on **understanding deep learning** by studying the complex interactions between datasets, architectures and optimization. In my work, I am providing a novel framework to design better and **more reliable neural networks** that exploit prior knowledge about the world.

## Education

Nov 2018 - (Spring 2023)    **PhD. Machine Learning**  
Ecole Polytechnique Fédérale de Lausanne, EPFL (Switzerland)

Sep 2016 - Aug 2018    **MSc. Electrical Engineering (Best graduate)**  
Delft University of Technology, TU Delft (Netherlands)

Sep 2011 - Jun 2015    **BSc. Telecommunications Engineering (Best graduate)**  
Universidad Politécnica de Madrid, UPM (Spain)

## Research experience

### Doctoral assistant at EPFL

Nov 2018 - (Spring 2023)    *Lausanne, Switzerland*

Studying the **inductive bias** of deep learning and how it affects its generalization and robustness properties. My research has already provided insights to improve **out-of-distribution generalization, adversarial defenses**, and to understand the **role of architecture in deep learning**.

### Master thesis at TU Delft

Nov 2017 - Aug 2018    *Delft, Netherlands*

Introduced a novel algorithm based on submodular optimization to sample tensor data and reconstruct it with near-optimal guarantees. Applications to point cloud compression and recommender systems.

### Research Intern at Philips Healthcare Research

Jul 2017 - Oct 2017    *Hamburg, Germany*

Developed self-supervised deep learning algorithms for representation learning and medical image reconstruction of fetal ultrasounds and CT scans.

### Research Assistant at Universidad Politécnica de Madrid

Jul 2015 - Jul 2016    *Madrid, Spain*

Pioneered the use of 3D rendering techniques from computer graphics to simulate radar scattering from the human skin at the THz band.

## Software skills

DL frameworks: JAX, PyTorch, Tensorflow  
Languages: Python, C, Matlab, Javascript, Java  
Misc: Unix, git, docker, vim

## Languages

Spanish: ●●●●● English: ●●●●○  
German: ●●●○○ French: ●●●○○  
Dutch: ●○○○○

## Awards

2018 **National Award for Excellence in Academic Performance** by Government of Spain  
2018 **Best graduate** by TU Delft (~1000 students)  
2016 **“La Caixa” Postgraduate Fellowship** by La Caixa Foundation (~45,000\$)  
2015 **Best graduate** by Universidad Politecnica de Madrid (~800 students)  
Other competitive grants (~18,000\$)

## Featured publications

### ML Conferences

- **What can linearized neural networks actually say about generalization?**. GOJ, S.M. Moosavi-Dezfooli and P. Frossard. In *Advances of Neural Information Processing Systems*, NeurIPS 2021.
- **Neural Anisotropy Directions**. GOJ\*, A. Modas\*, S.M. Moosavi-Dezfooli and P. Frossard. In *Advances of Neural Information Processing Systems*, NeurIPS 2020.
- **Hold me tight! Influence of discriminative features on deep network boundaries**. GOJ\*, A. Modas\*, S.M. Moosavi-Dezfooli and P. Frossard. In *Advances of Neural Information Processing Systems*, NeurIPS 2020.

### Journals

- **Optimism in the face of adversity: Understanding and improving deep learning through adversarial robustness**. GOJ, A. Modas, S.M. Moosavi-Dezfooli and P. Frossard. *Proceedings of the IEEE*. Feb 2021
- **Sparse sampling for inverse problems with tensors**. GOJ, M. Coutino, S.P. Chepuri and G. Leus. *IEEE Transactions on Signal Processing*, Jun 2019

### ML Workshops

- **A neural anisotropic view of underspecification in deep learning**. GOJ, I.F. Salazar-Reque, A. Modas, S.M. Moosavi-Dezfooli and P. Frossard. In *RobustML Workshop (ICLRw 2021)*
- **Redundant features can hurt robustness to distribution shifts**. GOJ\*, A. Modas\*, S.M. Moosavi-Dezfooli and P. Frossard. In *Uncertainty & Robustness in Deep Learning Workshop (ICMLw 2020)*

### Others

- **On the choice of graph neural network architectures**. C. Vignac, GOJ, and P. Frossard. In *IEEE Conference on Audio and Signal Processing*, ICASSP 2020
- **Forward-backward splitting for optimal transport based problems**. GOJ, M. El Gheche, E. Simou and P. Frossard. In *IEEE Conference on Audio and Signal Processing*, ICASSP 2020

## Teaching experience

- Machine learning.
- Fundamentals of inference and learning.
- A network tour of data science.
- Computational optimal transport.

## Community service

Reviewer in NeurIPS, ICLR, ICCV, IEEE TPAMI, ...

## Personal interests

Climbing, running, hiking, skiing, cooking and photography.