

# Oriol Barbany Mayor

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## Summary

PhD student working on computer vision for deformable object understanding and manipulation. I have followed graduate courses in mathematics and theoretical computer science, with an emphasis on machine learning, and I have a strong background in signal processing. Accustomed to a high level of workload and always eager to learn.

## Education

### Institut de Robòtica i Informàtica Industrial (IRI), CSIC-UPC

Barcelona

PHD IN ARTIFICIAL INTELLIGENCE - ELLIS PHD & POSTDOC PROGRAM

2021-now

- **Project:** Feedback models for real-time robotic cloth manipulation.
- **Exchange institution (as part of the ELLIS program):** École Polytechnique Fédérale de Lausanne (EPFL).
- **Supervisors:** Prof. Carme Torras and Dr. Adrià Colomé (IRI), and Prof. Amir Zamir (EPFL).

### École Polytechnique Fédérale de Lausanne (EPFL)

Lausanne

MSC. IN DATA SCIENCE

2018 - 2020

- **Average score:** 5.74/6.00
- **Activities:** Member of the *Orchestre Symphonique et Universitaire de Lausanne* and the Lausanne Student Chamber Orchestra.
- **Selected coursework:** Advanced Algorithms, Artificial Neural Networks, Automatic Speech Processing, Image Analysis and Pattern Recognition, Information Theory and Signal Processing, Machine Learning, Mathematical Foundations of Signal Processing, Mathematics of Data, Optimization for Machine Learning, Statistics for Data Science, and Time Series.

### Universitat Politècnica Catalunya (UPC)

Barcelona

BSC. IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING

2014 - 2018

- **Average score:** 8.49/10.00. 4th of the promotion. See [recognition of outstanding academic achievement](#).
- **Major:** Audiovisual Systems.
- **Course honors:** [Bachelor's thesis](#), Image and Video Processing, Acoustics and Electro-acoustics, Introduction to Deep Learning, Radiation and Propagation, Introduction to Audiovisual Processing, Electromagnetic Waves, Signals and Systems, Electromagnetism, Introduction to Mathematics, and Fundamentals of Computers.

### Escola Municipal de Música i Conservatori Professional de Sabadell

Sabadell

PROFESSIONAL DEGREE IN MUSIC

2002-2014

- Bassoon and harmony studies.

## Experience

### Amazon

Palo Alto

APPLIED SCIENTIST INTERN

Summer 2023

- **Project:** "Multimodal Search"
- **Summary:** Internship at the Visual Search & Augmented Reality team to include multimodal search functionalities into the current search systems. Work on Large Language Models (LLMs) and Vision-Language Models (VLMs).
- **Supervisors:** Dr. Arnab Dhua, Dr. Xinliang Zhu, and Michael Huang

### Amazon

Palo Alto

APPLIED SCIENTIST INTERN

Summer 2022

- **Project:** "Robust visual similarity learning"
- **Summary:** Worked on the Visual Search & Augmented Reality team to improve the Amazon Lens product (take a picture of anything and find the most similar product on the Amazon catalog). Proposed a solution to learn better visual similarity models (extracting a representation that correctly encodes the semantics of the image) using datasets with many wrong labels [5].
- **Supervisors:** Dr. Arnab Dhua, Dr. Xiaofan Lin, and Dr. Muhammet Bastan

### Amazon

Berlin

APPLIED SCIENTIST INTERN

Fall 2020

- **Project:** "Contextual Position Bias Estimation for Unbiased Learning to Rank"
- **Summary:** Devised a ranker-agnostic method to estimate the position bias (the tendency of users to engage with top-ranked results) under different contexts (e.g., user-specific browsing patterns, type of query, or type of device) from observational data (without needing feedback from users after performing interventions). The obtained method obtains better position bias estimates than ranker-dependent and intervention-based algorithms, which leads to an improved ranking performance [6].
- **Supervisor:** Dr. Matteo Ruffini and Dr. Giuseppe di Benedetto.

## Logitech Europe S.A.

ENGINEERING INTERN, AI TEAM

Lausanne

Spring 2020

- **Project:** "Speech and Audio Style Transfer" - Internship credited with Master Thesis
- **Summary:** This project introduced FastVC, a method for fast (4x faster than real-time on CPU) many-to-many (dealing with several speakers as sources and targets with a single model) nonparallel (trained with a dataset with source and target speakers uttering different phrases) Voice Conversion (VC). The proposed approach was accepted as a technical paper for the VC Challenge 2020, where FastVC outperformed the Challenge baselines in quality results on the cross-lingual VC task. See [thesis](#) and paper [2].
- **Supervisors:** Dr. Milos Cernak (Logitech) and Prof. Martin Jaggi (EPFL).

## Machine Learning and Optimization Laboratory @ EPFL

STUDENT RESEARCH ASSISTANT

Lausanne

Fall 2019

- **Project:** "Affine-Invariant Robust Training" - Semester project
- **Summary:** Proposed evolution strategies as zeroth order optimization algorithms to build robust models against affine transformation attacks (which, unlike  $\ell_p$  bounded adversarial attacks, covered in most works, are likely to appear in the real world). See [report](#) and [slides](#).
- **Supervisors:** Dr. Sebastian Stick, Maksym Andriushchenko (PhD candidate), and Prof. Martin Jaggi.

## Deloitte Advisory S.L.

INTERN AT RISK ADVISORY IT DEPARTMENT

Barcelona

Fall 2017

Bachelor's Internship - Hardening security measures of IT systems at Banc Sabadell.

## Publications

- [1] D. Blanco-Mulero, **Oriol Barbany**, G. Alcan, A. Colomé, C. Torras, and V. Kyrki. Benchmarking the Sim-to-Real Gap in Cloth Manipulation. *IEEE Robotics and Automation Letters*, 9(3):2981–2988, 2024.
- [2] **Oriol Barbany** and M. Cernak. FastVC: Fast Voice Conversion with non-parallel data. In *Joint Workshop for the Blizzard Challenge and Voice Conversion Challenge*, 2020.
- [3] **Oriol Barbany**, A. Bonafonte, and S. Pascual. Multi-Speaker Neural Vocoder. In *IberSPEECH*, 2018.
- [4] **Oriol Barbany**, A. Colomé, and C. Torras. Deformable Surface Reconstruction via Riemannian Metric Preservation. arXiv:2212.11596, 2023.
- [5] **Oriol Barbany**, X. Lin, M. Bastan, and A. Dhua. ProcSim: Proxy-Based Confidence for Robust Similarity Learning. In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pages 1308–1317, January 2024.
- [6] **Oriol Barbany Mayor**, V. Bellini, A. Buchholz, G. D. Benedetto, D. M. Granziol, M. Ruffini, and Y. Stein. Ranker-agnostic Contextual Position Bias Estimation. arXiv:2107.13327, 2021.

## Honours and Volunteering

### HONORS

2018	<b>1st prize</b> , Hackathon Mobility: SEAT Challenge - AI For Mobility & Driving Experience. See <a href="#">prize</a> and <a href="#">certificate</a>	Barcelona
2014	<b>Honour Prize</b> , Bassoon category: Granted during 6th course. See <a href="#">certificate</a>	Sabadell
2011	<b>Honour Diploma</b> , Bassoon category: Granted during 3rd course	Sabadell

### VOLUNTEERING

2020	<b>Volunteer</b> , International Conference on Machine Learning (ICML). See <a href="#">certificate</a> .	Vienna (Virtual)
2018	<b>Student Volunteer</b> , IEEE Wireless Communications and Networking Conference. See <a href="#">certificate</a> .	Barcelona

## Skills

<b>Programming Languages</b>	Python, C/C++, JAVA, R, Scala, MATLAB
<b>Tools</b>	Git/GitHub, Jupyter Notebook, $\LaTeX$ , Linux, AWS
<b>Python Packages</b>	NumPy, SciPy, scikit-learn, Pandas, Matplotlib, Seaborn
<b>Deep Learning Frameworks</b>	PyTorch, TensorFlow, MXNet, Keras
<b>Languages</b>	Catalan (Native), Spanish (Native), English (IELTS: 6.5 - <a href="#">see certificate</a> , TOEIC: 855 - <a href="#">see certificate</a> ), French (A1/A2 - <a href="#">see certificate</a> )