

FRANCISCO ROLDAN SANCHEZ

Email: fran.roldans@gmail.com

LinkedIn: www.linkedin.com/in/francisco-roldan-sanchez-870438113

GitHub: <https://github.com/franroldans>

Google Scholar: <https://scholar.google.com/citations?user=-Zy5WuAAAAAJ&hl=en>

RESEARCH AND PROFESSIONAL INTERESTS

- Reinforcement learning and data-driven AI methods for **real-world and physical systems**, including deployment under real-world constraints (safety, sample efficiency, and robustness).
 - **AI for good and sustainability**, focusing on applications with **economic, social, and environmental impact**, beyond purely profit-driven optimization.
 - **Human-in-the-loop reinforcement learning** for **trustworthy, interpretable, and aligned AI**, incorporating human feedback, preferences, and domain expertise into learning and decision-making.
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EDUCATION

Post-doc on Safe autonomous systems: Paris Télécom, Institute Polytechnique de Paris, Paris, France

06/2026- present

- Advisor: *Georgios Bakirtzis*

PhD in Artificial Intelligence: Dublin City University, Dublin, Ireland

02/2020 – 09/2024

- Thesis: [*Sample and time efficient strategies for off-policy reinforcement learning in robotic manipulation tasks*](#)
- Advisor: *Noel O'Connor, Kevin McGuinness and Stephen Redmond*

MSc in Computer Vision: Universitat Autònoma de Barcelona, Barcelona, Spain
10/2017 – 07/2018

- Thesis: *Speech-conditioned Face Generation with Generative Adversarial Networks*
- Paper: [WAV2PIX: Speech-conditioned Face Generation using Generative Adversarial Networks](#)
- Advisor: *Xavier Giro and Kevin McGuinness*

BSc in Telecommunications Engineering: Universitat Politècnica de Catalunya, Barcelona, Spain

09/2012 – 07/2017

- Thesis: [Visual-Question Answering 2.0](#)
- Advisor: *Xavier Giro*

TECHNICAL SKILLS

Programming: Python, Matlab

Data Science: pandas, PySpark, SQL

ML and RL: PyTorch, TensorFlow, Keras, scikit-learn, Gymnasium, RLlib, stable-baselines3, MLFlow

Methods: Reinforcement learning, deep learning, transformers, probabilistic modeling

Math: Linear algebra, optimization, probability, statistics

Systems & Tools: Linux, Mac, Windows, Git, Google Cloud, Docker

Languages: Catalan (native), Spanish (native), English

SELECTED PUBLICATIONS

A full list of publications can be seen [here](#)

- Duarte, Amanda Cardoso, Francisco Roldan, Miquel Tubau, Janna Escur, Santiago Pascual, Amaia Salvador, Eva Mohedano, Kevin McGuinness, Jordi Torres, and Xavier Giro-i-Nieto. "WAV2PIX: Speech-conditioned Face Generation using Generative Adversarial Networks." In *ICASSP*, vol. 2019, pp. 8633-8637. 2019. [Link](#) [Code](#)
- Wang, Qiang, Francisco Roldan Sanchez, Robert McCarthy, David Cordova Bulens, Kevin McGuinness, Noel O'Connor, Manuel Wüthrich, Felix Widmaier, Stefan Bauer, and Stephen J. Redmond. "Dexterous robotic manipulation using deep reinforcement learning and knowledge transfer for complex sparse reward-based tasks." *Expert Systems* 40, no. 6 (2023): e13205. [Link](#) [Code](#)

- Sanchez, Francisco Roldan, Qiang Wang, David Cordova Bulens, Kevin McGuinness, Stephen J. Redmond, and Noel E. O'Connor. "Learning and reusing primitive behaviours to improve Hindsight Experience Replay sample efficiency." In 2024 10th International conference on automation, robotics and applications (ICARA), pp. 328-333. IEEE, 2024. [Link Code](#)
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INDUSTRY EXPERIENCE

Reinforcement Learning Researcher— BeChained, Barcelona (Hybrid)

10/2025 – Present

- *Optimizing industrial machines and processes for improved energy efficiency.*
- *Developed Digital Twins of plastic injection molding and compressed air system processes and optimized them using RL techniques (PPO, DQN, DDPG, SAC, and others).*
- *Collaborated with Antonin Sebastien Ponsich (UPC) and Sara Hatami (UPC), co-supervising the industrial PhD of Maria Guasch (UPC - BeChained).*

Data Science Lecturer — CodeOp, Barcelona (Remote)

09/2024 – 06/2025

- *Data Science course organized for Servei d'Ocupació de Catalunya (SOC) that included Python programming, Data Science and Artificial Intelligence*

Deep Learning Engineer— Crisalix Labs S.L. , Barcelona

10/2018 – 05/2019

- *Deep Learning for aesthetic surgery, developing techniques for 3d face reconstruction.*
- *Developed a technique using a VGG with the norms of the depth sensor and the RGB image as inputs to detect 4 points of the face that were used to calibrate a depth sensor and the RGB camera. This was a critical step that before AI was introduced, surgeons had to do it manually, sometimes making mistakes that would lead to unsuccessful reconstructions.*

Python programming lecturer— Barcelona Technology School, Barcelona

09/2018 – 10/2018

- *Designed and taught a pre-introductory optional course for the Master of Big Data Solutions.*

Software Engineer Intern— i2CAT Foundation, Barcelona

04/2016 – 01/2017

- *Developed a statistical module for a WebRTC-based application using NodeJS.*
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TEACHING & SERVICE

Teacher assistant — Nvidia Deep Learning Institute workshop, Multiple Locations
5/2017 and 05/2018

- *Xavier Giro's teacher assistant at the workshop in Munich (5/2017) and Dublin (05/2018)*

Teacher assistant — CFIS Deep Learning Seminar at UPC, Barcelona
02/2017, 06/2017, 01/2018, 06/2018, 06/2019

- *Xavier Giro's teacher assistant at many workshops of the Summer School on Deep Learning for Computer Vision and the Winter School of Deep Learning for Artificial Intelligence*
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REFERENCES

- Xavier Giró: <https://imatge.upc.edu/web/people/xavier-giro>
 - xavier.giro@upc.edu
- Noel O'Connor: <https://www.insight-centre.org/our-team/prof-noel-oconnor/>
 - noel.oconnor@insight-centre.org
- Stephen Redmond: <https://people.ucd.ie/stephen.redmond>
 - stephen.redmond@ucd.ie