# Fernando Moreno-Pino, PhD

fernando.moreno-pino@eng.ox.ac.uk
https://fmorenopino.github.io
https://github.com/fmorenopino

Oxford-Man Institute of Quantitative Finance, University of Oxford.
Eagle House, Walton Well Road, OX2 6ED, Oxford, UK.

## Positions

- **Oxford-Man Institute of Quantitative Finance, University of Oxford** — Oxford, UK
  *Postdoctoral Researcher* — *Aug. 2023 - Present*
  - **Summary**: My research focuses on the intersection of Deep Learning, Probabilistic Machine Learning, and Quantitative Finance.
- **Universidad Carlos III de Madrid** — Madrid, Spain
  *Research & Teaching Associate, Signal Processing and Learning Group* — *Sep. 2018 - July 2023*
  - **Supervisors**: Prof. Dr. Antonio Artés Rodríguez.
  - **Summary**: I collaborate with Universidad Carlos III de Madrid in teaching and research activities.
- **University of Oxford** — Oxford, UK
  *Visiting Researcher, Oxford-Man Institute of Quantitative Finance* — *May 2022 - Oct. 2022*
  - **Supervisor**: Dr. Stefan Zohren.
  - **Summary**: Studying and developing of novel neural-based methods for the problems of assets' volatility forecasting and estimation of fill probabilities in Limit Order Books.
- **Universidad Carlos III de Madrid** — Madrid, Spain
  *Research Assistant, Signal Processing and Learning Group* — *Dec. 2017 - Sep. 2018*
  - **Supervisor**: Prof. Dr. Antonio Artés Rodríguez.
  - **Summary**: My work focused on applying Machine Learning techniques for the Human Activity Recognition problem.
- **Universidad de Málaga** — Málaga, Spain
  *Research Assistant, Department of Programming Languages and Computer Science* — *Jan. 2016 - Sep. 2016*
  - **Supervisor**: Prof. Dr. Pedro Merino Gómez.
  - **Summary**: I worked at the MORSE Research Group during my Bachelor Thesis, focused on developing communication systems software.

## Education

- **Universidad Carlos III de Madrid** — Madrid, Spain
  *PhD Candidate in Probabilistic Machine Learning (Cum Laude).* — *Sep. 2018 – May. 2023*
  - **Advisor**: Prof. Dr. Antonio Artés Rodríguez and Dr. Pablo Martínez Olmos.
  - **Research**: My research included probabilistic machine learning methods, signal processing techniques integration into deep-learning architectures, the development of DNN methodologies (as Transformer-based models) for time-series modelling and forecasting, and the application of ML techniques to quantitative finance-related problems. Previously, I have worked with heterogeneous models in high dimensional data for the problem of Human Activity Recognition.
- **Universidad Carlos III de Madrid** — Madrid, Spain
  *M.Sc. in Telecommunications Engineering* — *Sep. 2016 – Jul. 2018*
- **Universidad de Málaga** — Málaga, Spain
  *B.Sc. in Telecommunications Engineering* — *Sep. 2012 – Jul. 2016*
  - **Graduated with Honors**: Best academic record of the class.

## Publications

- Arroyo, Á*., Cartea, Á., Moreno-Pino, F.* & Zohren, S. (2023). Deep Attentive Survival Analysis in Limit Order Books: Estimating Fill Probabilities with Convolutional-Transformers. Available at SSRN.
- Moreno-Pino, F., Olmos, P. M., & Artés-Rodríguez, A. (2023). Deep Autoregressive Models with Spectral Attention. In Pattern Recognition, Elsevier, 2023.
- Martínez-García, M.*, Moreno-Pino, F.*, Olmos, P. M., & Artés-Rodríguez, A. (2023). Sleep Activity Recognition and Characterization from Multi-Source Passively Sensed Data. arXiv preprint arXiv:2301.10156.
- Moreno-Pino, F., Zohren, S. (2022). DeepVol: Volatility Forecasting from High-Frequency Data with Dilated Causal Convolutions. arXiv preprint arXiv:2210.04797.
- Moreno-Pino, F., Martínez-García, M., Olmos, P. M., & Artés-Rodríguez, A. (2022). Heterogeneous Hidden Markov Models for Sleep Activity Recognition from Multi-Source Passively Sensed Data. Accepted at ML4H 2022, collocated with NeurIPS.
- Moreno-Pino, F., Sükei, E., Olmos, P. M., & Artés-Rodríguez, A. (2022). PyHHMM: A Python Library for Heterogeneous Hidden Markov Models. arXiv preprint arXiv:2201.06968, submitted to the Journal of Machine Learning Research, Machine Learning Open Source Software section.
- Ríos-Muñoz, G. R., Moreno-Pino, F., Soto, N., M. Olmos, P. , Artés-Rodríguez, A., Ferández-Avilés, F., & Arenal, A. (2020). Hidden Markov Models for Activity Detection in Atrial Fibrillation Electrograms. In 2020 Computing in Cardiology (pp. 1-4). IEEE.
- Moreno-Pino, F., Porras-Segovia, A., López-Esteban, P., Artés, A., & Baca-García, E. (2019). Validation of Fitbit Charge 2 and Fitbit Alta HR against polysomnography for assessing sleep in adults with obstructive sleep apnea. Journal of Clinical Sleep Medicine, 15(11), 1645-1653.

## Others

- Moreno-Pino, F., Artés-Rodríguez, A. (2019). Human Activity Recognition in Psychiatric Patients through Heterogeneous Hidden Markov Models. Machine Learning Summer School (MLSS), Moscow, Russia (Poster).
- Moreno-Pino, F., Artés-Rodríguez, A. (2018). Sleep Activity Recognition through Hidden Markov Models. Data Science Summer School (DS3), Paris, France (Poster).

## Teaching

- **BBVA** — Madrid, Spain
  *Teaching Staff, Associated with Fundación Universidad Carlos III* — *Sep. 2021 – Present*
  - **Advanced Machine Learning and Feature Engineering Course**: 2022 – 2023.
  - **Natural Language Processing (NLP) Course**: 2021 – 2023
- **Universidad Carlos III de Madrid** — Madrid, Spain
  *Teaching Assistant (Bachelors in Electrical Engineering & Data Science and Engineering)* — *Sep. 2018 – Present*
  - **Signals and Systems**: 1st Semester 2023.
  - **Machine Learning II**: 1st Semester 2021.
  - **Bayesian Machine Learning, Modern Theory of Detection and Estimation**: 1st Semester 2018 – 2019.
  - **Communications Theory**: 1st Semester 2018 – 2019, 2023.
  - **Linear Systems**: 1st Semester 2018.

*Denotes co-first authors with equal contributions.

## Honor and Awards

- **FPU Grant**: My doctoral studies are funded by the Spanish Ministry of Education.
- **'Premios Extraordinarios de Fin de Estudios'**: This prize rewards the student with the best academic record, granted by Universidad de Málaga for my Bachelor studies.
- **'Premios Ingenio', Finalist**: These prizes award the best thesis of the year on the field of Telecommunications Engineering, in the Region of Andalusia, Spain.

## Summer Schools and Others

- **AI for Global Goals - University of Oxford** — Oxford, United Kingdom
  *ML x Finance* — *Aug. 2022*
- **University of Sheffield** — Sheffield, United Kingdom [Online]
  *The Gaussian Process Summer School* — *Sep. 2021*
- **University of Sheffield** — Sheffield, United Kingdom [Online]
  *The Gaussian Process Summer School* — *Sep. 2020*
- **Liège Université** — Liége, Belgium [Online]
  *Machine Learning Frontiers in Precision Medicine (MLFPM)* — *Sep. 2020*
- **ETH Zürich** — Basel, Switzerland
  *Machine Learning Frontiers in Precision Medicine (MLFPM)* — *Sep. 2019*
- **Skoltech** — Moscow, Russia
  *Machine Learning Summer School (MLSS)* — *Aug. 2019 – Sep. 2019*
- **École Polytechnique** — Paris, France
  *Data Science Summer School (DS3)* — *Jun. 2018*

## Reviewing

- **Artificial Intelligence and Statistics (AISTATS)**: 2023.
- **Pattern Recognition**: Since 2022.
- **IEEE Transactions on Neural Networks and Learning Systems**: Since 2021.
- **Journal of Biomedical and Health Informatics (JBHI)**: Since 2020.

## Courses

- **University of California, Santa Cruz** — Coursera [Online]
  *Bayesian Statistics: From Concept to Data Analysis, 4 weeks course* — *Jul. 2021*
- **DeepLearning.AI** — Coursera [Online]
  *Structuring Machine Learning Projects, 3 weeks course* — *May 2018*
- **DeepLearning.AI** — Coursera [Online]
  *Improving DNNs: Hyperparameter Tuning, Regularization and Optimization, 2 weeks course* — *May 2018*
- **Universidad Internacional Menéndez Pelayo** — Barcelona, Spain
  *English Inmersion Course* — *Apr. 2018*
- **DeepLearning.AI** — Coursera [Online]
  *Neural Networks and Deep Learning, 4 weeks course* — *Mar. 2018*
- **Stanford University** — Coursera [Online]
  *Machine Learning, 11 weeks course* — *Feb. 2018*
- **University of Washington** — Coursera [Online]
  *Machine Learning: Classification, 7 weeks course* — *Nov. 2017*

- **University of Washington** — Coursera [Online]
  *Machine Learning: Regression, 6 weeks course* — *Oct. 2017*
- **University of Washington** — Coursera [Online]
  *Machine Learning Foundations, 6 weeks course* — *Jul. 2017*
- **Nvidia Corporation, CUDA Fellows Program & Universidad de Málaga** — Málaga, Spain
  *Technical Training Course: Parallel Programming of the GPU with CUDA* — *Jul. 2016 – Aug. 2016*

## Languages

- **Spanish**: Native language.
- **English**: Advanced, TOEFL:102/120.
- **French**: Basic.

## Projects

- **Heterogeneous Hidden Markov Model**: Python implementation of a HMM model capable of managing heterogeneous and missing data: **https://github.com/fmorenopino/HeterogeneousHMM**, **https://pyhhmm.readthedocs.io/**.
- **VoIP calls**: C implementation of a Voice over IP calls' service (point-to-point audio conference). RTP over UDP was used: **https://github.com/fmorenopino/c_calls**.

## Programming Skills

- **Languages**: Python, Matlab, C, C++ **Technologies**: Pytorch, Keras, Sklearn, Jupyter, Git, LaTeX

## Referees

- Dr. Antonio Artés Rodríguez, Universidad Carlos III de Madrid, Spain.
- Dr. Pablo Martínez Olmos, Universidad Carlos III de Madrid, Spain.