

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.
 - **(Some) current projects:** Rough paths theory for efficient Transformers for very long time-series, spectral robust contrastive learning for noisy time-series, and survival analysis of limit orders in the LOB.
 - **Mathematical Institute, University of Oxford** Oxford, UK
Teaching Assistant Aug. 2023 - Present
 - **Summary:** Teaching the Deep Learning course at the MSc in Mathematical and Computational Finance, University of Oxford.
 - **Universidad Carlos III de Madrid** Madrid, Spain
Research & Teaching Associate, Signal Processing and Learning Group Sep. 2018 - July 2023
 - **Supervisor:** Prof. Dr. Antonio Artés Rodríguez.
 - **Summary:** I collaborated with Universidad Carlos III de Madrid in teaching and research activities.
 - **Oxford-Man Institute of Quantitative Finance, University of Oxford** Oxford, UK
Visiting Researcher 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 and Deep 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 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*

- Graduated with Honors: Best academic record of the class.

PUBLICATIONS

- **Moreno-Pino, F.***, Arroyo, Á.* , Waldon, H.* , Dong, X., Cartea, Á. (2024). Rough Transformers: Lightweight Continuous-Time Sequence Modelling with Path Signatures. Accepted at “Next Generation of Sequence Modeling Architectures” workshop, ICML 2024.
- **Moreno-Pino, F.***, Arroyo, Á.* , Waldon, H.* , Dong, X., Cartea, Á. (2024). Rough Transformers for Continuous and Efficient Time-Series Modelling. Accepted at “Learning from Time Series for Health” workshop, ICLR 2024.
- **Moreno-Pino, F.**, Olmos, P. M., & Artés-Rodríguez, A. (2023). Deep Autoregressive Models with Spectral Attention. In Pattern Recognition, Elsevier, 2023.
- Jiménez Rama, Ó., **Moreno-Pino, F.**, Ramírez, D., Olmos, P.M. (2023). Interpretable Spectral Variational AutoEncoder (ISVAE) for time series clustering. arXiv preprint arXiv:2310.11940.
- Arroyo, Á.*., Cartea, Á., **Moreno-Pino, F.*** & Zohren, S. (2023). Deep Attentive Survival Analysis in Limit Order Books: Estimating Fill Probabilities with Convolutional-Transformers. Presented at Euro Working Group on Commodities and Financial Modelling (EWGCFM) 2023 & in Quantitative Finance, Taylor & Francis, 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).

*Denotes co-first authors with equal contributions.

TEACHING

- **University of Oxford** Oxford, UK
Sep. 2023 – Present
 - *Teaching Assistant at the MSc in Mathematical and Computational Finance*
 - **Deep Learning** : 2023 – Present
- **BBVA** Madrid, Spain
Sep. 2021 – Present
 - *Teaching Staff, Associated with Fundación Universidad Carlos III*
 - **Advanced Machine Learning and Feature Engineering Course**: 2022 – Present
 - **Natural Language Processing (NLP) Course**: 2021 – Present
- **Universidad Carlos III de Madrid** Madrid, Spain
Sep. 2018 – July 2023
 - *Teaching Assistant (Bachelors in Electrical Engineering & Data Science and Engineering)*
 - **Signals and Systems**: 1st Semester 2023 (30 hours).
 - **Machine Learning II**: 1st Semester 2021 (38 hours).
 - **Bayesian Machine Learning, Modern Theory of Detection and Estimation**: 1st Semester 2018 – 2019 (61 hours).
 - **Communications Theory**: 1st Semester 2018 – 2019, 2023 (102 hours).
 - **Linear Systems**: 1st Semester 2018 (11 hours).

HONOR AND AWARDS

- **FPU Grant (2018-2022)**: My doctoral studies were funded by the Spanish Ministry of Education through competitive selection process (60996,12€).
- **Talentia Scholarship by “Junta de Andalucía” (2017, declined)**: Two years scholarship to complete the Master of Engineering at Cornell University’s New York campus (62092,68€).
- **‘Premios Extraordinarios de Fin de Estudios’ (2016)**: This prize rewards the student with the best academic record, granted by Universidad de Málaga for my Bachelor studies.
- **‘Premios Ingenio’, Finalist (2016)**: 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** Liège, 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)**: Since 2023.
- **Artificial ACM International Conference on AI in Finance (ICAIF)**: Since 2023.
- **Pattern Recognition**: Since 2022.
- **AAAI Conference on Artificial Intelligence**: Since 2022.
- **IEEE Transactions on Neural Networks and Learning Systems**: Since 2021.
- **Journal of Biomedical and Health Informatics (JBHI)**: 2020-2023.

COURSES

- **University of California, Santa Cruz**
Bayesian Statistics: From Concept to Data Analysis, 4 weeks course
 - **DeepLearning.AI**
Structuring Machine Learning Projects, 3 weeks course
 - **DeepLearning.AI**
Improving DNNs: Hyperparameter Tuning, Regularization and Optimization, 2 weeks course
 - **Universidad Internacional Menéndez Pelayo**
English Immersion Course
 - **DeepLearning.AI**
Neural Networks and Deep Learning, 4 weeks course
 - **Stanford University**
Machine Learning, 11 weeks course
 - **University of Washington**
Machine Learning: Classification, 7 weeks course
 - **University of Washington**
Machine Learning: Regression, 6 weeks course
 - **University of Washington**
Machine Learning Foundations, 6 weeks course
 - **Nvidia Corporation, CUDA Fellows Program & Universidad de Málaga**
Technical Training Course: Parallel Programming of the GPU with CUDA

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. Álvaro Cartea, University of Oxford, UK.
 - Dr. Antonio Artés Rodríguez, Universidad Carlos III de Madrid, Spain.
 - Dr. Pablo Martínez Olmos, Universidad Carlos III de Madrid, Spain.