

# Fernando Moreno-Pino, PhD

Oxford-Man Institute, University of Oxford



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## POSITIONS

- **Oxford-Man Institute, University of Oxford** Oxford, UK  
*Postdoctoral Researcher* Aug. 2023 - Present
  - **Summary:** My research lies at the intersection of Deep Learning, Probabilistic Machine Learning, and Quantitative Finance. I have led multiple first-author research projects on Machine Learning methods for spatio-temporal and sequential modeling and their application in quantitative finance, publishing in top venues in both fields.
  - **(Some) current projects:** Rough paths theory for efficient spatio-temporal 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, University of Oxford** Oxford, UK  
*Visiting Researcher. Founded by MAN Group* 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
  - **Dissertation:** “Deep Attentive Time Series Modelling for Quantitative Finance”
  - **Advisors:** 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 (Electrical Engineering)* Sep. 2016 – Jul. 2018
  - **Universidad de Málaga** Málaga, Spain  
*B.Sc. in Telecommunications Engineering (Electrical Engineering)* Sep. 2012 – Jul. 2016
    - **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 and Continuous Time Series Modelling through Signature Patching. In Advances in Neural Information Processing Systems 38 (NeurIPS), 2024.
  - **Moreno-Pino, F.**, Zohren, S. (2022). DeepVol: Volatility Forecasting from High-Frequency Data with Dilated Causal Convolutions. In Quantitative Finance, Taylor & Francis, 2024.
  - **Moreno-Pino, F.\***, Arroyo, Á.\* , Waldon, H.\* , Dong, X., Cartea, Á. (2024). Rough Transformers: Lightweight Continuous-Time Sequence Modelling with Path Signatures. In “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. In “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.**, 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.

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\* Denotes co-first authors with equal contributions.

## OTHERS

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- **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

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- **Engineering Science, University of Oxford** Oxford, UK  
*Tutor at the Intelligent Earth Centre for Doctoral Training* Jan. 2025 – Present
  - Deep Learning for Time Series Forecasting: 2025 – Present.
- **Mathematical Institute, University of Oxford** Oxford, UK  
*Teaching Assistant at the MSc in Mathematical and Computational Finance* Sep. 2023 – Present
  - Deep Learning : 2023 – Present.
- **BBVA** Madrid, Spain  
*Teaching Staff, Associated with Fundación Universidad Carlos III* Sep. 2021 – Present
  - Advanced Machine Learning and Feature Engineering Course: 2022 – Present
  - Natural Language Processing (NLP) Course: 2021 – Present
- **Universidad Carlos III de Madrid** Madrid, Spain  
*Reader (Lecturer) & Teaching Assistant -Bachelor in Electrical Engineering* Sep. 2018 – July 2023
  - 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

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- **MAN Group & OMI's Visitors Programme Fellowship (2022)**: My research visit at Oxford-Man Institute during my PhD was funded by the OMI's Visitors Programme (7200£).
- **UC3M Research Mobility Fellowship (July-October 2022)**: Fellowship to conduct research at the University of Oxford (4716€).
- **FPU Research Mobility Fellowship (May-July 2022)**: Fellowship to conduct research at the University of Oxford (4095€).
- **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.

## REVIEWING

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- **Neural Information Processing Systems (NeurIPS)**: Since 2024 (Reviewer and workshop proposals reviewer).
- **Journal of Applied Mathematical Finance**: Since 2024.
- **Artificial Intelligence and Statistics (AISTATS)**: Since 2023.
- **Artificial ACM International Conference on AI in Finance (ICAIIF)**: Since 2023.
- **Journal of Quantitative Finance**: 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.

## COMMITTEES

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- International Conference on AI in Finance (ICAIIF): 2023 (Program Committee).

## TALKS

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<b>SIAM Conference on Financial Mathematics and Engineering</b>	Miami, US
• <i>Rough Transformers: Lightweight and Continuous Time Series Modelling through Signature Patching - [Upcoming] Generative AI in Finance Seminar</i>	Jul. 2025
<b>Quantitative Risk Management and Mathematical Finance, University of Vienna</b>	Vienna, Austria
• <i>Rough Transformers: Lightweight and Continuous Time Series Modelling through Signature Patching - [Upcoming] Conference on Neural Dynamical Systems for Time-Series Data</i>	Apr. 2025
<b>Citi Bank</b>	New York, US
• <i>Rough Transformers: Lightweight and Continuous Time Series Modelling through Signature Patching - [Upcoming] Invited Talk</i>	Feb. 2025
<b>The Alan Turing Institute &amp; Mathematical Institute, University of Oxford</b>	London, UK
• <i>Rough Transformers: Lightweight Continuous-Time Sequence Modelling with Path Signatures - Workshop on Bridging Rough Paths and Deep Learning: New Frontiers</i>	Nov. 2024
<b>Oxford-Man Institute, University of Oxford</b>	Oxford, UK
• <i>Deep Autoregressive Models with Spectral Attention</i>	Mar. 2024
<b>Signal Processing and Learning Group, Universidad Carlos III de Madrid</b>	Madrid, Spain
• <i>Deep Attentive Time Series Modelling for Quantitative Finance</i>	Apr. 2023
<b>Oxford-Man Institute, University of Oxford</b>	Oxford, UK
• <i>DeepVol: Volatility Forecasting from High-Frequency Data with Dilated Causal Convolution</i>	Oct. 2022
<b>Signal Processing and Learning Group, Universidad Carlos III de Madrid</b>	Madrid, Spain
• <i>Deep Autoregressive Models with Spectral Attention</i>	Oct. 2021

## CONFERENCES, SUMMER SCHOOLS, AND OTHERS

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<b>NeurIPS</b>	Vancouver, Canada
• <i>Conference on Neural Information Processing Systems</i>	Dec. 2024
<b>ICML</b>	Vienna, Austria
• <i>International Conference on Machine Learning</i>	Jul. 2024
<b>ICLR</b>	Vienna, Austria
• <i>International Conference on Learning Representations</i>	May. 2024
<b>AISTATS</b>	Valencia, Spain
• <i>Artificial Intelligence and Statistics</i>	Apr. 2023
<b>AI for Global Goals - University of Oxford</b>	Oxford, United Kingdom
• <i>ML x Finance</i>	Aug. 2022
<b>University of Sheffield</b>	Sheffield, United Kingdom [Online]
• <i>The Gaussian Process Summer School</i>	Sep. 2021
<b>University of Sheffield</b>	Sheffield, United Kingdom [Online]
• <i>The Gaussian Process Summer School</i>	Sep. 2020
<b>Liège Université</b>	Liège, Belgium [Online]
• <i>Machine Learning Frontiers in Precision Medicine (MLFPM)</i>	Sep. 2020
<b>ETH Zürich</b>	Basel, Switzerland
• <i>Machine Learning Frontiers in Precision Medicine (MLFPM)</i>	Sep. 2019
<b>Skoltech</b>	Moscow, Russia
• <i>Machine Learning Summer School (MLSS)</i>	Aug. 2019 – Sep. 2019
<b>École Polytechnique</b>	Paris, France
• <i>Data Science Summer School (DS3)</i>	Jun. 2018

## 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](https://github.com/fmorenopino/c_calls).

PROGRAMMING SKILLS

- **Languages:** Python, Matlab, C, C++
  - **Technologies:** Pytorch, Keras, Sklearn, Jupyter, Git, L<sup>A</sup>T<sub>E</sub>X

## REFEREES

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