

Fernando Moreno-Pino, PhD

[fernando.moreno-pino@eng.ox.ac.uk](mailto: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, 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 contributed to multiple research projects on Machine Learning methods for time-series modeling and their application in quantitative finance, publishing in top venues in both fields.
    - **(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. 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* 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

- **Moreno-Pino, F.\***, Arroyo, Á.\* , Waldon, H.\* , Dong, X., Cartea, Á. (2024). Rough Transformers: Lightweight Continuous-Time Sequence Modelling with Path Signatures. In Advances in Neural Information Processing Systems 37 (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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- **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  
*Teaching Assistant (Bachelors in Electrical Engineering & Data Science and 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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- **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

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- **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

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

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• University of California, Santa Cruz	Coursera [Online]
<i>Bayesian Statistics: From Concept to Data Analysis, 4 weeks course</i>	Jul. 2021
• DeepLearning.AI	Coursera [Online]
<i>Structuring Machine Learning Projects, 3 weeks course</i>	May 2018
• DeepLearning.AI	Coursera [Online]
<i>Improving DNNs: Hyperparameter Tuning, Regularization and Optimization, 2 weeks course</i>	May 2018
• Universidad Internacional Menéndez Pelayo	Barcelona, Spain
<i>English Immersion Course</i>	Apr. 2018
• DeepLearning.AI	Coursera [Online]
<i>Neural Networks and Deep Learning, 4 weeks course</i>	Mar. 2018
• Stanford University	Coursera [Online]
<i>Machine Learning, 11 weeks course</i>	Feb. 2018
• University of Washington	Coursera [Online]
<i>Machine Learning: Classification, 7 weeks course</i>	Nov. 2017
• University of Washington	Coursera [Online]
<i>Machine Learning: Regression, 6 weeks course</i>	Oct. 2017
• University of Washington	Coursera [Online]
<i>Machine Learning Foundations, 6 weeks course</i>	Jul. 2017
• Nvidia Corporation, CUDA Fellows Program & Universidad de Málaga	Málaga, Spain
<i>Technical Training Course: Parallel Programming of the GPU with CUDA</i>	Jul. 2016 – Aug. 2016

## LANGUAGES

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

## PROJECTS

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- **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

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

## REFEREES

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- 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.