

Fernando Moreno-Pino, PhD



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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.
- **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 (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
- **Universidad de Málaga** Málaga, Spain
B.Sc. in Telecommunications Engineering Sep. 2012 – Jul. 2016
 - **Graduated with Honors:** Best academic record of the class.

PUBLICATIONS

- 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. Available at SSRN. Presented at Euro Working Group on Commodities and Financial Modelling (EWGCFM) 2023.
- **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

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

REVIEWING

- **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

• University of California, Santa Cruz	Coursera [Online]
<i>Bayesian Statistics: From Concept to Data Analysis, 4 weeks course</i>	<i>Jul. 2021</i>
• DeepLearning.AI	Coursera [Online]
<i>Structuring Machine Learning Projects, 3 weeks course</i>	<i>May 2018</i>
• DeepLearning.AI	Coursera [Online]
<i>Improving DNNs: Hyperparameter Tuning, Regularization and Optimization, 2 weeks course</i>	<i>May 2018</i>
• Universidad Internacional Menéndez Pelayo	Barcelona, Spain
<i>English Immersion Course</i>	<i>Apr. 2018</i>
• DeepLearning.AI	Coursera [Online]
<i>Neural Networks and Deep Learning, 4 weeks course</i>	<i>Mar. 2018</i>

• Stanford University Machine Learning, 11 weeks course	Coursera [Online] Feb. 2018
• University of Washington Machine Learning: Classification, 7 weeks course	Coursera [Online] Nov. 2017
• University of Washington Machine Learning: Regression, 6 weeks course	Coursera [Online] Oct. 2017
• University of Washington Machine Learning Foundations, 6 weeks course	Coursera [Online] Jul. 2017
• Nvidia Corporation, CUDA Fellows Program & Universidad de Málaga Technical Training Course: Parallel Programming of the GPU with CUDA	Málaga, Spain 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. 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.