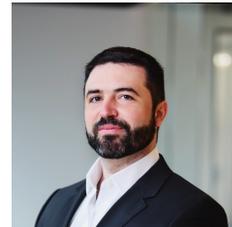


CHARILAOS MYLONAS, PH.D.

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About

I am a scientific computing expert with a strong high-performance computing background and over seven years of deep learning experience in both PyTorch and TensorFlow. I hold a Ph.D. from ETH Zurich, where my research featured original contributions in generative models and geometric deep learning, culminating in developing and open-sourcing a GNN library in TensorFlow.

Work Experience

- AUG 2025 – CURRENT** **EPAM** Lead AI Engineer and Technical Consultant (Agentic AI/Full-Stack/DevOps)
- Architected an extensible backend for LangGraph-based GenAI agents for portfolio optimization and insights in wealth management (Python, FastAPI).
 - Reduced token consumption by 35% for tool-calling agents by developing and using an in-house evaluation and benchmarking library for LangGraph (based on Chrome Trace Format).
- FEB 2025 – JUN 2025** **Modulai** Senior Machine Learning Engineer
- Implemented algorithms for large-scale community detection in transaction graphs and computed graph embeddings for the entire user base of a client in the peer-to-peer payments industry (more than 35 million users).
 - Achieved a 7% reduction in false positive rates by extending the client's boosted decision-tree-based fraud detection pipeline with a scalable graph-based feature computation pipeline.
 - Performed extensive feature selection and hyperparameter selection runs.
- SEPT 2024 – FEB 2025** **Deloitte** Assistant Manager
- Implemented a machine learning-enhanced methodology for improving the effectiveness of compliance monitoring for a client in the pharmaceutical industry.
- FEB 2022 – SEPT 2024** **Deloitte** Senior Consultant
- Designed and created early GenAI Retrieval-Augmented Generation (RAG) prototypes.
 - Developed machine learning techniques for transaction graph embeddings and money laundering risk estimation in blockchain.
 - Implemented and benchmarked a deep learning-based diarization (speech processing) system for the compliance department of a large Swiss bank (PyTorch, scikit-learn).
 - Modernized and developed a Python interface for the legacy credit risk analytics code of a large Swiss bank (Python, Excel, R).
- SEPT 2016 – NOV 2021** **ETH Zurich** Ph.D. Candidate/Research Assistant
- Performed research on probabilistic ML for structural health monitoring and predictive maintenance of wind energy infrastructure (Python, TensorFlow, Graph Machine Learning, conditional VAEs).
 - Implemented and open-sourced a message-passing GNN library (<https://github.com/mylonasc/tf-gnns/>).
- DEC 2015 – SEPT 2016** **ETH Zurich** Research Assistant
- Contributed to the computational statistics software UQLab by implementing uncertainty quantification and sensitivity analysis algorithms.
- JUL 2014 – DEC 2014** **Credit Suisse** Full-Stack Trading Tool Developer (Internship)
- Implemented and validated a high-level interface for an option pricer (C++ to R), achieving a more than 10-fold performance improvement by replacing the pre-existing interface.

Education

- SEPT 2016 – SEPT 2021 **ETH Zurich**
Ph.D. in MACHINE LEARNING FOR STRUCTURAL HEALTH MONITORING UNDER UNCERTAINTY
Advisor: Prof. Eleni Chatzi
- SEPT 2012 – SEPT 2015 **ETH Zurich**
M.Sc. in COMPUTATIONAL SCIENCE AND ENGINEERING
Specialization: Computational Electromagnetics
Advisor: Prof. Ralf Hiptmair

Technical Strengths

Programming Languages	Python, Matlab, R C++, Java, JavaScript	●●●●●● ●●●●○○
Other software development skills	Linux, Docker, Kubernetes, ML Algorithms, Data Structures and Algorithms, High Performance Computing, Scientific Computing, Software Design, Web Development, Retrieval Augmented Generation systems, Microcontroller Programming	
Deep Learning	Probabilistic Generative Models (GANs, VAEs, Normalizing Flows, Denoising Diffusion models), Graph Neural Networks, Core Deep Learning architectures (gated RNNs, CNNs, Attention Mechanisms & Transformers) and how they apply to different data modalities (text, audio, images, tabular data).	

Other Information

Teaching assistant roles

- High Performance Computing for CSE (C++, OpenMP) (2020) (Prof. O. Schenk).
- Method of Finite Elements (Matlab, Python) (2017 – 2019) (Prof. E. Chatzi).

Other academic engagements

- *Mentorship*: Serving as mentor for Ph.D. students at ETH Zurich (upon invitation).
- *Student project supervision*: 6 MSc theses and semester projects and consulted on several others.
- *Reviewer assignments*: for Mechanical Systems and Signal Processing and Journal of Sound and Vibration.

Distinctions and certificates

- **Best paper award** in 39th IMAC conference (Feb. 2021).
- **SIAM Gene Golub Scholarship** for Ph.D. summer school on “*High-Performance Data Analytics*” Aussois, France 2019.

Selected Publications

Please refer to [Google Scholar](#) [link] for full list and updated citation count.

Mylonas, C. (ETH Ph.D. Dissertation) Machine Learning for Structural Health Assessment under Uncertainty, with applications in Wind Energy, [link]

Mylonas C., Chatzi E. Remaining Useful Life Estimation for Engineered Systems Operating under Uncertainty with Causal GraphNets. Sensors. 2021; 21(19):6325. <https://doi.org/10.3390/s21196325>

Mylonas, C., Abdallah, I., Chatzi, E. Conditional variational autoencoders for probabilistic wind turbine blade fatigue estimation using SCADA data. Wind Energy. 2021; 1- 18. <https://doi.org/10.1002/we.2621>

Lai, Z., Mylonas, C., Nagarajaiah, S., & Chatzi, E. Structural identification with physics-informed neural ordinary differential equations. Journal of Sound and Vibration, 508, 116196.

Mylonas, C., Abdallah, I., Chatzi, E. (2021) Relational VAE: A Continuous Latent Variable Model for Graph Structured Data [link]

Mylonas, C., Tsialiamanis, G., Worden, K. & Chatzi, E. Bayesian graph neural networks for strain-based crack localization. (39th IMAC conference proc.) [link]

Mylonas, C., Abdallah, I., & Chatzi, E. (2020). Deep Unsupervised Learning For Condition Monitoring and Prediction of High Dimensional Data with Application on Windfarm SCADA Data. In *Model Validation and Uncertainty Quantification, Volume 3 (pp. 189-196)*. Springer, Cham.