CHARILAOS MYLONAS

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http://mylonasc.xyz https://github.com/mylonasc
Mylonas Charilaos

Work Experience

Sept 2016–Sept 2021 | **ETH Zürich**
PhD Researcher

- Conceptualized and implemented novel applications of graph neural networks to structural condition monitoring and statistical modeling for wind farms and wind turbines (Python/TensorFlow/distributed computing)
- Implemented and open-sourced a message-passing GNN library (`https://github.com/mylonasc/tf-gnns/`)
- Performed large–scale wind farm and wind turbine Monte-Carlo simulations

Dec 2015–Sept 2016 | **ETH Zürich**
Research Assistant

- Implemented and tested automated hyper-parameter tuning and training strategies for a CP-tensor decomposed regression module
- Implemented and tested various numerical algorithms related to uncertainty quantification
- Co-authored technical reports and documentation

Jul 2014– Dec 2014 | **Credit Suisse**
Full-Stack Software Developer (internship)

- Implemented and validated in C++ an R interface for an option pricer, achieved more than 10-fold improvement by replacing pre-existing interface.
- Implemented a REST server to retrieve data from a MySQL timeseries database and an interactive web GUI for time series visualization.
- Implemented a web-based script editor for an internal domain specific language for sharing time series processing pipelines and visualizations.
- Developed unit tests & benchmarks for the created code, including automated inter-commit benchmarking scripts.

Education

Sept 2016 – Sept 2021 | **ETH Zürich**
PhD in Machine Learning for Structural Health Monitoring under Uncertainty
Expected graduation: September 2021
Advisor: Prof. Eleni Chatzi

Sept 2012 – Sept 2015 | **ETH Zürich**
MSc in Computational Science and Engineering
Thesis: *Shape Optimization with Boundary Elements*
Advisor: Prof. Ralf Hiptmair

Sept 2005 – May 2012 | **Aristotle University of Thessaloniki**
MSc Civil Engineering
Thesis: *Computational homogenization for composites with the finite element method.*
Advisor: Prof. Nicolas Charalambakis

Technical Strengths

Programming	Python · Matlab · R · Java · JavaScript · C++ · SQL · Bash
Software Development	machine learning algorithms · deep learning · scientific computing · software design · test-driven development · full–stack web development
Other relevant skills	distributed/parallel computing · computer vision

Other information

Teaching assistant roles

· High Performance Computing for Computational Science and Engineering (2020) (Prof. O. Schenk)
· Method of Finite Elements (2017 – 2019) (Prof. E. Chatzi)
· Linear Algebra Lab (2008) (Prof. Chara Charalambous)

Other academic engagement

· *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) for the paper "*On an application of graph neural networks in population based SHM*"
· *Human Subject Reseach Certificate* (Data or Specimens Only) CITI-Program Training (April 2020)
· **SIAM Gene Golub Scholarship** for PhD summer school on "*High-Performance Data Analytics*" *Aussois, France 2019*

Selected Publications

May 2021 ***Mylonas, C****, Abdallah, I, Chatzi, E.* Relational VAE: A Continuous Latent Variable Model for Graph Structured Data (`https://arxiv.org/abs/2106.16049`) under review, NeurIPS 2021

February 2021 ***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

December 2020 ***Mylonas, C.****, Tsialiamanis, G., Worden, K. and Chatzi, E.* Bayesian graph neural networks for strain-based crack localization. *arXiv preprint arXiv:2012.06791, 2020*

Tsialiamanis G., ***Mylonas C.****, E. Chatzi, D.J. Wagg, N. Dervilis , K. Worden* On an application of graph neural networks in population based SHM (*to appear in 39th IMAC conference proceedings*) (`https://tinyurl.com/1l3ii887`)

November 2020 ***Mylonas C.****, & Chatzi E.* Remaining Useful Life Estimation Under Uncertainty with Causal GraphNets. *arXiv preprint arXiv:2011.11740, 2020*

Lai, Z., ***Mylonas, C****., Nagarajaiah, S. and Chatzi, E., 2021.* Structural identification with physics-informed neural ordinary differential equations. Journal of Sound and Vibration, 508, p.116196.

January 2019 ***Mylonas, C.****, Abdallah, I., & Chatzi, E. N. (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.*

May 2017 Konakli K., ***Mylonas C.***, Marelli S., Sudret B. UQlab User Manual - Canonical low-rank approximations *Report UQLab-V1.0-108, Chair of Risk, Safety & Uncertainty Quantification, ETH Zurich, 2017.*

Personal Interests

Electronics & microcontrollers · digital art · Guitar playing · Neuroscience & AI