

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 (Python/TensorFlow/distributed computing)
- Conceptualized novel applications of generative models to damage accumulation
- Contributed to open-source wind turbine and wind farm simulation library
- Implemented and open-sourced a message-passing GNN library (<https://github.com/mylonasc/tf-gnns/>)

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 Research 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

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| May 2021 | <i>Mylonas, C., Abdallah, I., Chatzi, E.</i> Relational VAE: A Continuous Latent Variable Model for Graph Structured Data (https://arxiv.org/abs/2106.16049) under review, NeurIPS 2021) |
| February 2021 | <i>Mylonas, C., Abdallah, I., Chatzi, E.</i> 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 | <i>Mylonas, C., Tsialiamanis, G., Worden, K. and Chatzi, E.</i> Bayesian graph neural networks for strain-based crack localization. <i>arXiv preprint arXiv:2012.06791, 2020</i>

<i>Tsialiamanis G., Mylonas C., E. Chatzi, D.J. Wagg, N. Dervilis, K. Worden</i> On an application of graph neural networks in population based SHM (to appear in 39th IMAC conference proceedings) (https://tinyurl.com/1l3ii887) |
| November 2020 | <i>Mylonas C., & Chatzi E.</i> Remaining Useful Life Estimation Under Uncertainty with Causal GraphNets. <i>arXiv preprint arXiv:2011.11740, 2020</i>

<i>Lai, Z., Mylonas, C., Nagarajaiah, S. and Chatzi, E., 2021.</i> Structural identification with physics-informed neural ordinary differential equations. Journal of Sound and Vibration, 508, p.116196. |
| January 2019 | <i>Mylonas, C., Abdallah, I., & Chatzi, E. N. (2020).</i> Deep Unsupervised Learning For Condition Monitoring and Prediction of High Dimensional Data with Application on Windfarm SCADA Data. In <i>Model Validation and Uncertainty Quantification, Volume 3 (pp. 189-196).</i> Springer, Cham. |
| May 2017 | Konakli K., <i>Mylonas C.</i> , Marelli S., Sudret B. UQlab User Manual - Canonical low-rank approximations <i>Report UQLab-V1.0-108, Chair of Risk, Safety & Uncertainty Quantification, ETH Zurich, 2017.</i> |

Personal Interests

Electronics & microcontrollers

digital art

Guitar playing

Neuroscience & AI