

# CHARILAOS MYLONAS

🌐 <http://mylonasc.xyz>    🌐 <https://github.com/mylonasc>  
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## Work Experience

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| SEPT 2016–SEPT 2021 | <b>ETH Zurich</b><br><i>PhD Researcher</i> <ul style="list-style-type: none"><li>· Research on applications of scalable probabilistic machine learning for structural condition monitoring of wind turbines and wind farms (Python, TensorFlow)</li><li>· Implemented a message-passing Graph Network library (<a href="https://github.com/mylonasc/tf-gnns/">https://github.com/mylonasc/tf-gnns/</a>)</li><li>· Performed large-scale Monte-Carlo simulations (Bash, cluster computing)</li><li>· Engaged in industrial collaboration (raw data curation, deep learning for remaining useful life prediction)</li></ul>   |
| DEC 2015–SEPT 2016  | <b>ETH Zurich</b><br><i>Research Assistant</i> <ul style="list-style-type: none"><li>· Implemented and tested automated hyper-parameter tuning and training strategies for a CP-tensor decomposed regression module (Matlab)</li><li>· Implemented and tested uncertainty quantification algorithms</li><li>· Developed a full-stack proof-of-concept web interface to sensitivity analysis and regression module (PHP, JavaScript, Matlab)</li></ul>   |
| DEC 2014–AUG 2015   | <b>ETH Zurich</b><br>(MSc Thesis, C++)  |
| JUL 2014–DEC 2014   | <b>Credit Suisse</b><br><i>Full-Stack Software Developer (internship)</i> <ul style="list-style-type: none"><li>· Implemented and validated a high level interface for an option pricer, achieved more than 10-fold improvement by replacing pre-existing interface (C++, R)</li><li>· Implemented a REST server to retrieve data from a time series database and an interactive web GUI for time series visualization (Python, JavaScript, MySQL)</li><li>· Implemented a web-based script editor for an internal domain specific language for sharing time series processing pipelines and visualizations</li><li>· Developed unit tests &amp; benchmarks, including automated inter-commit benchmarking scripts (Python)</li></ul> |

## Education

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|-----------------------|---|
| SEPT 2016 – SEPT 2021 | <b>ETH Zürich</b><br>PhD in MACHINE LEARNING FOR STRUCTURAL HEALTH MONITORING UNDER UNCERTAINTY<br>Advisor: Prof. Eleni Chatzi  |
| SEPT 2012 – SEPT 2015 | <b>ETH Zürich</b><br>MSc in COMPUTATIONAL SCIENCE AND ENGINEERING<br>Specialization: Computational Electromagnetics<br>Thesis: <i>Shape Optimization with Boundary Elements</i><br>Advisor: Prof. Ralf Hiptmair |
| SEPT 2005 – MAY 2012  | <b>Aristotle University of Thessaloniki</b><br>MSc CIVIL ENGINEERING<br>Thesis: <i>Computational Homogenization for Composites With the Finite Elements</i><br>Implementation in COMSOL and FreeFem++           |

# Technical Strengths

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<b>Programming Languages</b>	Python, Matlab, R C++, Java JavaScript, SQL	●●●●●● ●●●●○○, ●●●○○○
<b>Other software development skills</b>	Bash, Linux, Git, Classical ML Algorithms, Scientific Computing, Software Design, Full-Stack Web Development, High Performance Computing (parallel/distributed), OpenCV, microcontroller programming	
<b>Deep learning</b>	Probabilistic Generative Models (GANs/VAEs/Normalizing flows), Graph Neural Networks. Personal projects on CV and NLP.	

# Other information

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## Teaching assistant roles

- High Performance Computing for CSE (C++, OpenMP) (2020) (Prof. O. Schenk)
- Method of Finite Elements (Matlab) (2017 – 2019) (Prof. E. Chatzi)
- Linear Algebra Lab (2008) (Prof. C. 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

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<b>May 2021</b>	<i>Mylonas, C., Abdallah, I., Chatzi, E.</i> Relational VAE: A Continuous Latent Variable Model for Graph Structured Data ( <a href="https://arxiv.org/abs/2106.16049">https://arxiv.org/abs/2106.16049</a> ) under review, NeurIPS 2021
<b>February 2021</b>	<i>Mylonas, C., Abdallah, I., Chatzi, E.</i> Conditional variational autoencoders for probabilistic wind turbine blade fatigue estimation using SCADA data. <i>Wind Energy</i> . 2021; 1- 18. <a href="https://doi.org/10.1002/we.2621">https://doi.org/10.1002/we.2621</a>
<b>December 2020</b>	<i>Mylonas, C., Tsialiamanis, G., Worden, K. and Chatzi, E.</i> Bayesian graph neural networks for strain-based crack localization. <i>arXiv:2012.06791 to appear in 39th IMAC conference proc.</i> <i>Tsialiamanis G., Mylonas C., Chatzi E., Wagg, D.J., Dervilis N., Worden, K.</i> On an application of graph neural networks in population based SHM <i>arXiv:2103.03655 (to appear in 39th IMAC conference proceedings)</i>
<b>November 2020</b>	<i>Mylonas C. &amp; 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. <i>Journal of Sound and Vibration</i> , 508, p.116196.
<b>January 2019</b>	<i>Mylonas, C., Abdallah, I., &amp; Chatzi, E. N. (2020).</i> Deep Unsupervised Learning For Condition Monitoring and Prediction of High Dimensional Data with Application on Windfarm SCADA Data. <i>In Model Validation and Uncertainty Quantification, Volume 3 (pp. 189-196).</i> Springer, Cham.
<b>May 2017</b>	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 &amp; Uncertainty Quantification, ETH Zurich, 2017.</i>

# Personal Interests

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Electronics & Microcontrollers      Deep learning in art      Guitar playing      Neuroscience & AI