CHARILAOS MYLONAS

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

Work Experience

Sept. 2016–Present — **ETH Zürich**
Ph.D. Candidate / Research Assistant

- Defined and implemented novel applications of GraphNets to localization with arbitrarily positioned sensors, remaining useful life prediction and wind farm wake interactions
- Employed deep generative models to model operational conditions of wind farms and blade damage accumulation (Python/TensorFlow)
- Contributed to OpenFAST wind turbine and wind farm simulation software (FORTRAN)
- Created a graph networks 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, replacing pre-existing text-based one (more than 10-fold performance improvement)
- Implemented a REST-API server and an interactive web GUI
- Implemented a web-based script editor for a domain specific language for sharing of time series processing pipelines and visualizations.
- Developed unit tests & benchmarks for the created code, including automated inter-commit benchmarking scripts

Education

Sept. 2016 – Present — **ETH Zürich**
Ph.D. in Probabilistic Machine Learning For Condition Assessment in Wind Energy
Advisor: Prof. Eleni Chatzi

Sept. 2012 – Sept. 2015 — **ETH Zürich**
M.Sc. in Computational Science and Engineering
Focus: Electomagnetics
Thesis: *Shape Optimization with Boundary Elements*

Sept. 2005 – May 2012 — **Aristotle University of Thessaloniki**
Dipl. Ing. Civil Engineering
Focus: Structural Engineering
Thesis: *Asymptotic Expansion Homogenization with Finite Elements*

Technical Strengths

Programming	Python (Advanced), Matlab (Advanced), R, Java, JavaScript, C++ (intermediate), Bash
SW Development Experience	Scientific Computing (FEM/FVM/BEM/Particle Methods), Machine learning algorithms Test-driven development, Full–stack web development, Design patterns & Software design
Other relevant skills	Distributed/parallel computing (OpenMP, MPI), Large dataset creation and processing, Custom web–based tools for model performance inspection and comparison Fast and self–driven learner and creative problem solver

Other Information

Academic Engagement

- 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)
- Student project supervision 6 M.Sc. theses and semester projects, 2 ongoing, and consulted on several others
- Reviewer assignments for Mechanical Systems and Signal Processing and Journal of Sound and Vibration
- Mentor for ETH Academia Industry Modeling (AIM) week

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 Ph.D. summer school on "*High-Performance Data Analytics*" *Aussois, France 2019*

Selected Publications

***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

***Mylonas C.**, Tsialiamanis G., Worden K. and Chatzi E. N.* Bayesian Graph Neural Networks for Strain-Based Crack Localization. *arXiv preprint arXiv:2012.06791, 2020 (to appear in 39th IMAC conference proceedings)*

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`)

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

***Mylonas, C.** and Chatzi, E.* Deep CNNs and Adversarial Regularization for Fatigue Damage Failure Prediction of Concrete Anchors *3rd general assembly of the Swiss Community for Computational Methods in Applied Sciences (SWISSCOMMAS)*

***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.*

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.*

Mylonas C. Shape Optimization with Boundary Elements (M.Sc. thesis for Computational Science degree)

Personal Interests

Electronics & microcontrollers | Digital art | Human Computer Interfaces | Neuroscience