IOANNIS KALOGERIS

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PROFILE

My general interest lies in the field of Applied and Computational Mechanics. Particularly, my research activity is focused on advanced finite element methods, analysis and design of composite materials, computational methods for uncertainty quantification and reliability, Bayesian approaches for model parameter inference and machine learning techniques for surrogate modeling. This research has led to the development of novel methodologies and algorithms, capable of handling computationally challenging engineering problems, such as stochastic nonlinear dynamic analysis of structures and multiscale analysis of structures comprised of reinforced composites. I have participated in various European research programs relevant to the aforementioned subjects, from which I gained valuable experience and knowledge. Moreover, I have published several research papers in high impact factor scientific journals and presented my research at international conferences, as well. Lastly, I am a member of the MGroup research team (https://github.com/mgroupntua/), actively working on the development of a multi-purpose finite element software for advanced engineering applications, and a member of the CSE-Lab (https://www.cse-lab.ethz.ch/) in ETHZ working on the development of the Korali software, which is an open-source software for Machine Learning, Optimization and Uncertainty Quantification.

EDUCATION

Postdoctoral studies in Computational Mechanics *Nov. 2021 - Present*
Eidgenössiche Technische Hochschule Zürich
Department of Mechanical and Process Engineering

Postdoctoral studies in Computational Mechanics *Feb. 2020 - Nov. 2021*
National Technical University of Athens
School of Civil Engineering
Institute of Structural Analysis & Antiseismic Research

Bachelor in Mathematics *Mar. 2017 - Nov. 2020*
National and Kapodistrian University of Athens Very Good 8.00/10.0
School of Science
Department of Mathematics
Concentration: *Theoretical Mathematics*

Ph.D. in Computational Mechanics *Oct. 2014 - Feb. 2020*
National Technical University of Athens
School of Civil Engineering
Institute of Structural Analysis & Antiseismic Research
Ph.D. thesis title: *Advanced surrogate modeling and machine learning methods in computational stochastic mechanics*

M.Sc in Analysis and Design of Structures *Sep. 2012 - Jul. 2014*
National Technical University of Athens Very Good 8.87/10.0
School of Civil Engineering
Institute of Structural Analysis & Antiseismic Research

Diploma in Civil Engineering *Sep. 2006 - Oct. 2011*
National Technical University of Athens Very Good 7.54/10.0
School of Civil Engineering
Institute of Structural Analysis & Antiseismic Research
Concentration: *Structural Engineering*

Certificate of graduation (High School) *Sep. 2003 - 2006*
Kareas High School, Athens Excellent 19.25/20.0

TECHNICAL SKILLS & OTHERS

Programming Languages	C#, Python
Scientific Software	MATLAB, Mathematica, Maple, Abaqus, Ansys, Sap2000
Other Software	LaTeX, Microsoft Office
Languages	Greek, Engish-Proficiency of Cambridge, German-Mittelstufe
Military Service	completed (Oct. 2011 - Jun. 2012)

PUBLICATIONS IN SCIENTIFIC JOURNALS

1. Nikolopoulos S., **Kalogeris I.**, Papadopoulos V., *Non-intrusive surrogate modeling for parametrized time-dependent PDEs using convolutional autoencoders*, Engineering Applications of Artificial Intelligence, vol. 109. 2022

2. Bakalakos S., **Kalogeris I.**, Papadopoulos V., Papadrakakis M., Maroulas P., Dragatogiannis D.A., Charitidis C.A., *An integrated XFEM modeling with experimental measurements for optimizing thermal conductivity in carbon nanotube reinforced polyethylene*, Modelling and Simulation in Materials Science and Engineering, 2022

3. Lu X., Yvonnet J., Papadopoulos L., **Kalogeris I.**, Papadopoulos V., *A stochastic FE^2 data-driven method for nonlinear multiscale modeling*, Materials, vol. 14, 2021

4. Pyrialakos S., **Kalogeris I.**, Sotiropoulos G., Papadopoulos V., *A neural network-aided Bayesian identification framework for multiscale modeling of nanocomposites*, Computer Methods in Applied Mechanics and Engineering, vol. 384, 2021

5. **Kalogeris I.**, Papadopoulos V., *Diffusion maps-aided Neural Networks for the solution of parametrized PDEs*, Computer Methods in Applied Mechanics and Engineering, vol. 376, 2021

6. Bakalakos S., **Kalogeris I.**, Papadopoulos V., *An extended finite element method formulation for modeling multi-phase boundary interactions in steady state heat conduction problems*, Composite Structures, vol. 258, 2021

7. **Kalogeris I.**, Papadopoulos V., *Diffusion maps-based surrogate modeling: An alternative machine learning approach*, International Journal of Numerical Methods in Engineering, vol. 121, pp. 602-620, 2020

8. Papadopoulos V., **Kalogeris I.**, Giovanis D., *A spectral stochastic formulation for nonlinear framed structures*, Probabilistic Engineering Mechanics, vol. 55, pp. 90-101, 2019

9. **Kalogeris I.**, Papadopoulos V., *Limit analysis of stochastic structures in the framework of the probability Density Evolution Method*, Engineering Structures, vol. 160, pp. 304-313, 2018

10. Papadopoulos V., **Kalogeris I.**, *A Galerkin-based formulation of the probability density evolution method for general stochastic finite element systems*, Computational Mechanics, vol. 57, pp. 701-716, 2016

CONFERENCE PRESENTATIONS

1. **Kalogeris I.**, Pyrialakos S., Bakalakos S., Kokkinos O., Papadopoulos V., *Machine learning-assisted stochastic optimization of structures comprised of nano-reinforced concrete*, International Congress on Computational Mechanics organized by the Greek Association of Computational Mechanics (10th GRACM), Virtual Congress, 5-7 July 2021

2. Pyrialakos S., **Kalogeris I.**, Sotiropoulos G., Papadopoulos V., *Bayesian Inference on Multiscale Models of Carbon-Reinforced Polymers accelerated by Deep Neural Networks*, Engineering Mechanics Institute Conference (EMI), Virtual Congress, 25-28 May 2021

3. Nikolopoulos S., **Kalogeris I.**, Papadopoulos V., *An autoencoder-based surrogate modeling approach for parametrized time-dependent PDEs*, 14th World Conference on Computational Mechanics (WCCM XIV) and 8th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2020), joint Virtual Congress, 11-15 January 2021

4. Pyrialakos S., **Kalogeris I.**, Papadopoulos V., *A Bayesian identification framework for multiscale analysis of nanocomposites*, 14th World Conference on Computational Mechanics (WCCM XIV) and 8th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2020), joint Virtual Congress, 11-15 January 2021

5. Nikolopoulos S., **Kalogeris I.**, Papadopoulos V., *A machine learning approach for parametric time-history analysis*, XI International Conference on Structural Dynamics (EURODYN 2020), Athens, Greece, 23-26 November 2020

6. **Kalogeris I.**, Papadopoulos V., *A Diffusion Maps-based surrogate model for uncertainty quantification*, 3nd International Conference on Uncertainty Quantification in computational science and engineering (UNCECOMP), Hersonissos, Crete, Greece, 24-26 June 2019

7. Papadopoulos V., **Kalogeris I.**, Ibraimakis M., Giovanis D., *Consistent Bayesian update for multiscale analysis using subset simulation*, 13th World Congress on Computational Mechanics (WCCM), New York, USA, 22-28 July 2018

8. **Kalogeris I.**, Papadopoulos V., Giovanis D., *A spectral stochastic finite element formulation for nonlinear analysis of stochastic structures*, 8th Conference on Computational Stochastic Mechanics (CSM), Paros, Greece, 11-13 June 2018

9. Papadopoulos V., **Kalogeris I.**, Giovanis D., *An SSFEM formulation for the stochastic analysis of nonlinear framed structures*, 2nd International Conference on Uncertainty Quantification in computational science and engineering (UNCECOMP), Rhodes, Greece, 15-17 June 2017

10. **Kalogeris I.**, Papadopoulos V. *Probability Density Evolution Method for buckling analysis of stochastic systems*, 7th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2016), Crete, Greece, 5-10 June 2016

11. Papadopoulos V., **Kalogeris I.**, *A Streamline Upwind/Petrov-Galerkin solution of the Probability Density Evolution Method for static systems*, Symposium on Reliability of Engineering System (SRES), Hangzhou, Shanghai, China, 15-17 October 2015

TEACHING EXPERIENCE

- Teaching assistant in National Technical University of Athens (NTUA), Department of Civil Engineering
  Course: **Data-driven models in Engineering Applications** (graduate course)

- Teaching assistant in National Technical University of Athens (NTUA), Department of Civil Engineering
  Course: **Computer-aided Analysis and Design of Structures**

- Teaching assistant in National Technical University of Athens (NTUA), Department of Civil Engineering
  Course: **Advanced topics in Finite Element Analysis**

- Teaching assistant in National Technical University of Athens (NTUA), Department of Civil Engineering
  Course: **Stochastic finite elements** (graduate course)

- Teaching assistant in National Technical University of Athens (NTUA), Department of Civil Engineering
  Course: **Static Analysis of Structures**

- Teaching assistant in School of Pedagogical and Technological Education (ASPAITE), Department of Civil Engineering
  Course: **Probabilistic Analysis and Reliability Analysis of structures** (graduate course)

PARTICIPATION IN RESEARCH PROJECTS

*Data driven computational mechanics at exascale (**DCoMEX**)*, under the call H2020-JTIEuroHPC-2019-1, Budget: 3.000.000 Euros, project's duration 3 years (Participation: 1/10/2021-today)

Design of Hyperconcrete reinforced with nanomaterials, Supporting Researchers of the Operational Program 'Education and Lifelong Learning', National Ministry of Development and Investments, Budget: 45.000 Euros, project's duration 15 months (Participation: 1/6/2020-31/8/2021)

Optimal multiscale design of innovative materials for heat exchange applications, (HEAT-68/1286), European Regional Development Fund and Greek national Funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call Research-Create-Innovate, Budget: 800.000 Euros, project's duration 3 years (Participation: 10/12/2018-31/12/2019)

Analysis and Performance-based design of structures comprised of composite materials, Research projects for Excellency, IKY/SIEMENS, Budget: 50.000 Euros, project's duration 2 years (Participation: 1/9/2015-31/8/2017)

Mastering the computational challenges in numerical modeling and optimum design of CNT reinforced composites, (**MASTER**), European Research Council Advanced Grant. Budget: 2.500.000 Euros, project's duration 5 years (Participation: 1/10/2014-28/2/2018)

MEMBERSHIPS

- Member of the Technical Chamber of Greece   2012-present
- Member of the Greek Association of Computational Mechanics   2021-present

REVIEWER IN JOURNALS

- Computer Methods in Applied Mechanics and Engineering

- Probabilistic Engineering Mechanics

- Reliability Engineering and System Safety

- Computers & Mathematics with Applications

AWARDS & DISTINCTIONS

- Awarded by the Greek Association of Computational Mechanics for the best phd thesis in Greece. in the field of computational mechanics for the year 2020