HAMIDREZA EIVAZI

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iD ORCID

R^G ResearchGate

𝒢 Google Scholar

ACADEMIC BACKGROUND

2021 – present	**Research Assistant - PhD Student**	**Institute for Software and Systems Engineering, TU Clausthal, DE**
		Research Training Group CircularLIB, TU Braunschweig, DE
	Thesis title: Physics-Informed Machine Learning for Multiscale Simulations	
2020 – 2021	**Visiting Researcher**	**KTH Royal Institute of Technology, SE**
	Focus on Machine Learning for Turbulence	
2018 – 2020	**Researcher**	**University of Tehran, IR**
	Focus on Machine Learning for Fluid Dynamics	
2012 – 2015	**Master's Degree in Aerospace Engineering**	**University of Tehran, IR**
	Majoring in Aerodynamics	
2007 – 2012	**Bachelor's Degree in Mechanical Engineering**	**University of Mazandaran, IR**
	Majoring in Mechanics	

RESEARCH INTERESTS

Physics-informed machine learning
Scientific machine learning   Computational physics
Numerical simulations   Finite-element method
Reduced-order modeling   Dynamical systems
HPC   Parallel programming

PROGRAMMING SKILLS

Programming Languages: Python Matlab Julia Fortran C/C++ VB.NET

Machine Learning: TensorFlow PyTorch JAX Flax PyMC scikit-learn Pandas PySINDy

Other: Bash Git LaTeX FORPy

CITATIONS

Citations: 700   **H-index**: 11   **Complete list of publications:** 𝒢 Google Scholar

SELECTED PUBLICATIONS

Accepted

Hamidreza Eivazi, Alikhani, M., Tröger, J. A., Wittek, S., Hartmann, S., & Rausch, A. (2024). Enhancing Multiscale Simulations with Constitutive Relations-Aware Deep Operator Networks. arXiv:2405.13759. `https://doi.org/10.48550/arXiv.2405.13759`

Published

Hamidreza Eivazi, Wittek, S., & Rausch, A. Nonlinear model reduction for operator learning. In The Second Tiny Papers Track at ICLR 2024. `https://openreview.net/forum?id=Jw6TUpB7Rw`

Published

J.-A. Tröger, **Hamidreza Eivazi**, S. Hartmann, S. Wittek, A. Rausch (2023). Efficient integration of deep neural networks in sequential multiscale simulations. PAMM 23 (4), e202300052. `https://doi.org/10.1002/pamm.202300052`

Published

Hamidreza Eivazi, J.-A. Tröger, S. Wittek, S. Hartmann, A. Rausch (2023). FE^2 Computations with deep neural networks: Algorithmic structure, data generation, and implementation. Mathematical and Computational Applications 28 (4). `https://doi.org/10.3390/mca28040091`

Published

Hamidreza Eivazi, Wang, Y., & Vinuesa, R. (2024). Physics-informed deep-learning applications to experimental fluid mechanics. Measurement science and technology, 35(7), 075303. `https://doi.org/10.1088/1361-6501/ad3fd3`

Published

Hasanuzzaman, G., **Hamidreza Eivazi**, Merbold, S., Egbers, C., & Vinuesa, R. (2023). Enhancement of PIV measurements via physics-informed neural networks. Measurement Science and Technology, 34(4), 044002. `https://doi.org/10.1088/1361-6501/aca9eb`

Published

Hamidreza Eivazi, M. Tahani, P. Schlatter, R. Vinuesa (2022). Physics-informed neural networks for solving Reynolds-averaged Navier–Stokes equations. Physics of Fluids. Physics of Fluids 34 (7). `https://doi.org/10.1063/5.0095270`

Published

Jardines, A., **Hamidreza Eivazi**, Zea, E., García-Heras, J., Simarro, J., Otero, E., ... & Vinuesa, R. (2024). Thunderstorm prediction during pre-tactical air-traffic-flow management using convolutional neural networks. Expert systems with applications, 241, 122466. `https://doi.org/10.1016/j.eswa.2023.122466`

Published

Hamidreza Eivazi, Le Clainche, S., Hoyas, S., & Vinuesa, R. (2022). Towards extraction of orthogonal and parsimonious non-linear modes from turbulent flows. Expert Systems with Applications, 117038. `https://doi.org/10.1016/j.eswa.2022.117038`.

Published

Borrelli, G., Guastoni, L., **Hamidreza Eivazi**, Schlatter, P., & Vinuesa, R. (2022). Predicting the temporal dynamics of turbulent channels through deep learning. International Journal of Heat and Fluid Flow 96, 109010. `https://doi.org/10.1016/j.ijheatfluidflow.2022.109010`.

Published

Hamidreza Eivazi, L. Guastoni, P. Schlatter, H. Azizpour and R. Vinuesa (2021). Recurrent neural networks and Koopman-based frameworks for temporal predictions in a low-order model of turbulence. International Journal of Heat and Fluid Flow, 90, 108816. `https://doi.org/10.1016/j.ijheatfluidflow.2021.108816`.

Published

Hamidreza Eivazi, H. Veisi, M.H. Naderi, and V. Esfahanian. Deep neural networks for nonlinear model order reduction of unsteady flows. Physics of Fluids, 32(10), 105104. `https://doi.org/10.1063/5.0020526`.

TEACHING EXPERIENCE

2023-2024	**Lecturer**	**Institute for Software and Systems Engineering, TU Clausthal**
	Applied Deep Learning	
2023-2024	**Lecturer**	**Institute for Software and Systems Engineering, TU Clausthal**
	Introduction to Artificial Intelligence	
2021	**Teaching Assistant**	**University of Bologna & KTH Royal Institute of Technology**
	Data driven Methods in Engineering, Prof. R. Vinuesa	
2020	**Teaching Assistant**	**SCI, KTH Royal Institute of Technology**
	Data-driven Methods in Engineering (FSM3001), Prof. R. Vinuesa	

THESIS SUPERVISION

2024	**Institute for Software and Systems Engineering, TU Clausthal**	**Supervisor: Prof. A. Rausch**
	Deep learning for prediction of capacity degradation in Li-ion batteries	
2023	**Institute for Software and Systems Engineering, TU Clausthal**	**Supervisor: Prof. A. Rausch**
	Physics-informed neural operators for multiscale FE^2 computations	
2020	**Engineering Mechanics, KTH Royal Institute of Technology**	**Supervisors: Profs. R. Vinuesa and P. Schlatter**
	Predicting the temporal dynamics of turbulent channels through deep learning	

CONFERENCES

2024	**International Conference on Learning Representations (ICLR)**	**Vienna, Austria.**
2024	**94rd GAMM Annual Meeting**	**Magdeburg, Germany.**
2023	**93rd GAMM Annual Meeting**	**Dresden, Germany.**
2022	**12th International Symposium on Turbulence and Shear Flow Phenomena (TSFP12)**	**Osaka, Japan (Online).**
2021	**13th ERCOFTAC Symp. on Engineering Turbulence Modeling and Measurements (ETMM13)**	**Rhodes, Greece (Online).**
2019	**The 32nd Nordic Seminar on Computational Mechanics.**	**Oulu, Finland.**

SERVICE TO THE COMMUNITY

Reviewer for:
Physics of Fluids - Physical Review Fluids - Scientific Reports - Data in Brief - Soft Computing and more

LANGUAGES

Persian - native
English - proficient
German - rudimentary

SPORT

Professional Basketball Player (2005 - 2011)
Basketball Coach (3rd Degree)

REFERENCES

Prof. Dr. Andreas Rausch

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Prof. Ricardo Vinuesa

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