Date of Birth: 9 August 1996
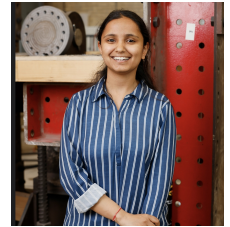*Citizenship: Indian*
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Taniya Kapoor

Work Experience

2021 – 2024   **Faculty of Civil Engineering and Geosciences, TU Delft**, *Delft, The Netherlands*
Doctoral Employee and Teaching Assistant, Advisors: *H Wang, A Núñez, R Dollevoet*
Topic: *Physics-inspired machine learning for fundamental structural elements*

2021   **Seminar for Applied Mathematics, ETH Zürich**, *Zürich, Switzerland*
Master Internship, Host: *Siddhartha Mishra, CAMLab*
Topic: *Physics-informed neural networks for fully nonlinear partial differential equations*

2018 – 2019   **Department of Mathematics, Indian Institute of Technology Delhi**, *Delhi, India*
Master Thesis, Host: *Harish Kumar*
Topic: *Active flux schemes for hyperbolic conservation laws*

Education

2020 – 2021   **Masters in High Performance Scientific Computing**, *Université de Lille, Lille, France*.

2017 – 2019   **Masters in Applied Mathematics**, *South Asian University*, *Delhi, India*.

2014 – 2017   **Bachelors in Mathematics**, *Deshbandhu College*, University of Delhi, *Delhi, India*.

Fellowships, Schlorships and Grant

2023   **Travel grant** for attending *CWI Autumn School, Amsterdam, The Netherlands*
2021   **PhD fellowship** Sorbonne University, France *(declined)*
2021   **PhD fellowship** University of Twente, The Netherlands *(declined)*
2021   **DAAD PhD fellowship** RWTH Aachen, Germany *(declined)*
2020 – 2021   **Fully funded** *CEMPI LABEX* fellowship for masters, *France*
2017 – 2019   **Fully funded** *Merit scholarship* for masters, *SAARC* nations

Research Interests

SciML, Physics-informed machine learning, Partial differential equations, Computational sciences

Publications

2024   **T Kapoor**, H Wang, A Núñez, R Dollevoet, Transfer learning for improved generalizability in causality-respecting PINNs for beam simulations. *Engineering Applications of Artificial Intelligence.*

2024   **T Kapoor***, A Chandra*, D M Tartakovsky, H Wang, A Núñez, R Dollevoet, Neural oscillators for generalization of physics-informed machine learning. *Proceedings of the 38th AAAI Conference on Artificial Intelligence.*

2023   **T Kapoor**, H Wang, A Núñez, R Dollevoet, Physics-informed neural networks for solving forward and inverse problems in complex beam systems, *IEEE Transactions on Neural Networks and Learning systems.*

2023   **T Kapoor**, A Chandra, D M Tartakovsky, H Wang, A Núñez, R Dollevoet, Neural oscillators for generalizing parametric PDEs, *Workshop at the 37th conference on Neural Information Processing Systems: Deep Learning for Differential Equations III*

2023   S Kapoor, A Chandra, **T Kapoor**, M Curti, Gradient weighted physics-informed neural networks for capturing shocks in porous media flows, *Workshop at the 37th conference on Neural Information Processing Systems: Machine Learning and the Physical Sciences*

2023   **T Kapoor**, H Wang, A Núñez, R Dollevoet, Physics-informed machine learning for moving load problems, *XII International Conference on Structural Dynamics, Delft.*

2022   **T Kapoor**, H Wang, A Núñez, R Dollevoet, Predicting traction return current in electric railway systems through physics-informed neural networks, *IEEE Symposium Series on Computational Intelligence, Singapore*

Preprint

2023   A Chandra*, **T Kapoor***, B Daniels, M Curti, K Tiels, D M Tartakovsky, E A Lomonova, Neural oscillators for magnetic hysteresis modeling, under review.

Invited Talks

2024   Neural oscillators for generalization of physics-informed neural networks, Brown University, CRUNCH Seminar, Division of Applied Mathematics, Providence, USA

2022   Physics-informed learning for traction return current, TU Delft, Rail Seminar, CITG, Delft, The Netherlands

Contributed Talks

2024   **T Kapoor**, A Chandra, D M Tartakovsky, H Wang, A Núñez, R Dollevoet, Neural oscillators for generalization of physics-informed machine learning, *Knowledge guided machine learning bridge program AAAI (lightining talk), Vancouver Canada 2024*

2023   Physics-informed machine learning for moving loads, XII international conference on Structural Engineering, Delft, The Netherlands, 2023

2022   Predicting traction return current in electric railway systems through physics-informed neural networks, Symposium series on computational Intelligence, Singapore 2022

Posters

2024   **T Kapoor**, A Chandra, D M Tartakovsky, H Wang, A Núñez, R Dollevoet, Neural oscillators for generalization of physics-informed machine learning, *AAAI Conference on Artificial Intelligence, Vancouver Canada 2024*

2024   **T Kapoor**, A Chandra, D M Tartakovsky, H Wang, A Núñez, R Dollevoet, Neural oscillators for generalization of physics-informed machine learning, *Knowledge guided machine learning bridge program AAAI, Vancouver Canada 2024*

2023   **T Kapoor**, A Chandra, D M Tartakovsky, H Wang, A Núñez, R Dollevoet, Neural oscillators for generalizing parametric PDEs, *NeurIPS 2023 Workshop DLDE*

2023   S Kapoor, A Chandra, **T Kapoor**, M Curti, Gradient weighted physics-informed neural networks for capturing shocks in porous media flows, *NeurIPS 2023 Workshop ML4PS*

2023   **T Kapoor**, H Wang, A Núñez, R Dollevoet, Physics-informed neural networks for solving forward and inverse problems in complex Beam Systems, *CWI Autumn School - Scientific Machine Learning and Dynamical Systems, Amsterdam, The Netherlands.*

2022   **T Kapoor**, R Molinaro, S Mishra, Physics-informed neural networks for approximating fully nonlinear PDEs, *London Mathematical Society Workshop on the Mathematics of Deep Learning.*

Skills

Programing   Python, MATLAB, PyTorch, TensorFlow, Cuda, MPI, OpenMP
Language   English (fluent), Hindi (native)

Reviewer Activities

Journals   *IEEE TNNLS, Engineering with Computers, Thin-Walled Structures, SoftwareX*
Conferences   *ICLR 2024 AI4DiffEqtnsInSci Workshop, NeurIPS DLDE 2023 Workshop, IJCNN, EURODYN*

Teaching Activities at TU Delft

Co-supervisor   Master thesis: Neural networks infused with physics for beam systems

Supervision   Led the development of a project proposal titled 'Physics-Informed Neural Networks for Simulating the Dynamics of Beam Systems' for the masters course 'Data Science and AI for Engineers' and supervised 9 students.

Material   Prepared tutorials and exams for courses: A1, MUDE, Dynamica

Examiner   Data Science and AI for Engineers