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Areas of specialization

Scientific machine learning • Spatio-temporal statistics • Probabilistic modeling (Gaussian processes) • Bayesian optimization • Causal inference • Time-series classification and forecasting • Uncertainty quantification • State-space modeling (simulation)

Stack: Python • PyTorch (GPYtorch/BoTorch) • JAX • SciPy stack • HPC (Slurm)

Professional appointments

Focused Energy, San Francisco, U.S.A.

2025 –

Senior scientist

- Architected and built the company's digital twin platform (PyTorch): multi-physics inertial confinement fusion (ICF) simulation campaigns with probabilistic surrogates and Bayesian optimization in the loop
- Develop novel (multi-fidelity) surrogate models and Bayesian optimization methods, deployed in production against simulations costing thousands of GPU-hours per evaluation
- Use simulation and uncertainty quantification to de-risk design decisions: where a design fails, how confident that verdict is, and which experiment would resolve it
- First-author research on Student's t -processes, showing plug-in Gaussian process prediction intervals systematically under-cover
- Lead collaborations with UMass Amherst, TU Darmstadt, CSIRO, the Princeton Plasma Physics Laboratory and Cornell; publish peer-reviewed ML and ICF research and mentor junior researchers and interns

Siemens Technology, Berkeley & Princeton, U.S.A.

2022 – 2025

Principal investigator & Staff research scientist

- Principal investigator on DARPA's [CASTLE](#) program: translated the program's open-ended goals into tractable ML research questions and deliverables – reinforcement learning and optimization methods against advanced persistent cyber threats (defined and co-wrote the proposal that secured the \$3.4m grant)
- Led a cross-institutional team of more than ten researchers and academics
- Provided deep subject expertise in converting theory into computational models, implementing said models and then applying these to real-world problems (typically followed by a write-up and publication)
- Supervised and mentored junior researchers (Siemens colleagues) and interns (M.Sc. and Ph.D. students)

University of Cranfield, Cranfield, U.K.

2023 –

Visiting fellow

- Research combustion and thermodynamic systems; gas turbine performance, efficiency deterioration, diagnostics and prognostics, combining physical models, simulation and causal inference
- Co-supervise Ph.D. students with faculty at the [Centre for Propulsion and Thermal Power Engineering](#)
- Publish scientific literature and research code to integrate with industry tools

The Alan Turing Institute, London, U.K.

2021 –

Visiting researcher (2022) ← Senior research associate (2021) ← Principal investigator (2021)

- Lead joint collaboration between The Alan Turing Institute and government researchers on project combining causal inference and Bayesian optimization for [cybersecurity threat detection and active cyber defense](#)
- Develop new methods for optimal decision making under uncertainty in collaboration with multiple groups at the institute and external partners
- Awarded two research grants from U.K.'s Government Communications Headquarters to conduct research on reinforcement learning and optimization methods for cybersecurity threat detection and optimal defense

The Alan Turing Institute & University of Warwick, London, U.K.

2020 – 2021

Postdoctoral researcher

- Developed methods at the intersection of causal inference, spatial statistics and Bayesian optimization for the [London Digital Twin \(urban air quality\)](#) – a geospatial model of an environmental system

- Led [Project Odysseus – London’s Digital Twin of Busyness](#), fusing large-scale heterogeneous sensor and mobility data into a city-scale spatio-temporal model of transport and socioeconomic activity, used by the Greater London Authority and Transport for London to target pandemic interventions
- Supervised a team of research assistants building multi-resolution, multi-task regression and spatial point-process models to estimate COVID case counts across the 32 boroughs of London

Kamin Artificial Intelligence AB, Stockholm, Sweden

2017 – 2023 **Research scientist & Founder**

- Co-founder: built the company from inception to shipping product, specializing in pre-packaged machine learning solutions for industrial applications
- Took a fully automatic diagnostic system for equine veterinary medicine from instrumentation and data acquisition through computer vision and signal processing to field deployment
- Developed nonlinear state-space models for disease progression modeling

University of Liverpool, Liverpool, U.K.

2019 – 2020 **Postdoctoral researcher**

- Developed non-intrusive screening methods capable of [detecting early signs of Parkinson’s disease](#), using deep learning (natural language processing) and spatio-temporal statistics
- Derived and implemented new models and authored the relevant findings for publication

Mind Foundry, Oxford, U.K.

2017 – 2019 **Research scientist**

- Built automated machine learning systems that construct and select models directly from data, for data-driven industrial applications
- Employed time-series analysis, statistical signal processing and machine learning techniques to design classification algorithms for various numerical data-types
- Designed [flexible Bayesian nonparametric models for analysis and model-construction](#) of real-world data-sets

Education

University of Oxford, Oxford, U.K.

2012 – 2017 D.Phil. (Ph.D.) in Computer Science (machine learning and robotics)

- Thesis: [Bayesian nonparametric methods for dynamics identification and prosthesis control](#)
- Advisors: [Frank Wood](#), [Ingmar Posner](#) and [Michael Osborne](#)

Imperial College London, London, U.K.

2008 – 2012 M.Eng. Aeronautical Engineering

- Thesis: Methodology and processes for structural optimization of aircraft wings (sponsored by the Ministry of Defence’s Defence Science and Technology Laboratory)
- Internship: Schlumberger Oilfield U.K. PLC

Selected relevant papers

- 2026 • Oliveira, R., **Dhir, N.** Multi-Fidelity Neural Operator Thompson Sampling. Under review in: *NeurIPS ‘26 Workshop on AI for Stochastic Dynamics*.
- Zhan, Y., Arana-Catania, M., **Dhir, N.**, Li, Y. A Forward Model for Route- and Season-Dependent High-Pressure Compressor Efficiency Deterioration in Turbofan Engines. Under review in: *Journal of Turbomachinery*.
- 2025 • Kwon Y., Choe Y., Park S., **Dhir, N.**, Lee S. [Non-Stationary Structural Causal Bandits](#). *Neural Information Processing Systems (NeurIPS ‘25)*.  [yeahoon-k/NS-SCMMAB](#)
- Hernandez Cano, L., Perroni-Scharf, M., **Dhir, N.**, Ramamurthy, A., Solar-Lezama, A. [Neurosymbolic World Models for Sequential Decision Making](#). *International Conference on Machine Learning (ICML ‘25)*.  [SWMPO](#)
- 2024 • Walsh, J., Kesa, O., Wang, A., Ilas, M., O’Hara, P., Giles, O., **Dhir, N.**, Girolami, M., Damoulas, T. [Near Real-Time Social Distance Estimation in London](#). *The Computer Journal*, 67(1):95–109.
- Haycock, C., Thorpe-Woods, E., Walsh, J., O’Hara, P., Giles, O., **Dhir, N.**, Damoulas, T. [An Expectation-Based Network Scan Statistic for a COVID-19 Early Warning System](#). Pre-print: [arXiv:2012.07574](#).
- 2023 • Branchini, N., Aglietti, V., **Dhir, N.**, Damoulas, T. [Causal Entropy Optimization](#). *International Conference on Artificial Intelligence and Statistics (AISTATS, ‘23)*.
- 2021 • Aglietti, V.*, **Dhir, N.***, González, J., Damoulas, T. [Dynamic Causal Bayesian Optimization](#). *Neural Information Processing Systems (NeurIPS ‘21)*.  [neildhir/DCBO](#)

*Equal contribution.

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