Namrata Deka

PhD Student · Machine Learning

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Summary

Ph.D. student at Carnegie Mellon University, focusing on causal representation learning, multimodal planning and generation. Experienced in both academic and applied ML research with proficiency in Python, PyTorch and TensorFlow. **Actively seeking a Summer 2026 research internship.**

Education

Carnegie Mellon University *Pittsburgh, USA*

Ph.D., Machine Learning *2023 - Present*

- Advisors: Dr. Kun Zhang, Dr. Jeff Schneider

University of British Columbia *Vancouver, Canada*

M.Sc., Computer Science *2020 - 2023*

- Advisor: Dr. Danica J. Sutherland
- Thesis: Kernel Methods for Invariant Representation Learning: Enforcing Fairness and Conditional Independence

Indraprastha Institute of Information Technology *New Delhi, India*

B.Tech., Computer Science and Engineering *2013 - 2017*

- Honors thesis/undergrad research advisors: Dr. Saket Anand, Dr. Sanjit K. Kaul

Publications

Peer-Reviewed Conferences

Z. He, R. Pogodin, Y. Li, **N. Deka**, A. Gretton, D. Sutherland. *On the Hardness of Conditional Independence Testing in Practice*, in the 39th Annual Conference on Neural Information Processing Systems (**NeurIPS**), 2025 (Spotlight).

R. Pogodin*, **N. Deka***, Y. Li*, D.J. Sutherland, V. Veitch, A. Gretton. *Efficient Conditionally Invariant Representation Learning*, in the 11th International Conference on Learning Representations (**ICLR**), 2023 (Oral/Top 5%). *Equal Contribution.

N. Deka, D.J. Sutherland. *MMD-B-Fair: Learning Fair Representations with Statistical Testing*, in the 26th International Conference on Artificial Intelligence and Statistics (**AISTATS**), 2023.

Currently Under Review

Y. Shen, P. Zhu, Z. Li, S. Zie, Z. Tang, **N. Deka**, Z. Liu, G. Chen, K. Zhang. *Controllable Video Generation with Provable Disentanglement*. Preprint 2025 (arXiv:2502.02690).

Workshops & Technical Reports

Y. Khandelwal, M. Arvind, S. Kumar, A. Gupta, S.K. Danisetty, P. Bagad, A. Madan, M. Lunayach, A. Annavajjala, A. Maiti, S. Jain, A. Dalmia, **N. Deka**, J. White, J. Doshi, A. Kanazawa, R. Panicker, A. Raval, S. Rana, M. Tapaswi. *NurtureNet: A Multi-task Video-based Approach for Newborn Anthropometry*, in the 7th **CVPR** Workshop on Computer Vision for Physiological Measurements (CVPM), 2024 (Best Paper).

N. Deka, D. Sutherland. *Learning Privacy-Preserving Deep Kernels with Known Demographics*, in the 36th **AAAI** Conference on Artificial Intelligence. Workshop on Privacy-Preserving Artificial Intelligence (PPAI), 2022.

D. Sutherland, **N. Deka**. *Unbiased estimators for the variance of MMD estimators*. Technical report 2022 (arXiv:1906.02104).

Professional Experience

Borealis AI *Vancouver, Canada*

ML Research Intern *2022*

- Audited ML models for automated discovery of systematic errors in under-represented groups using slice discovery methods.

École Polytechnique Fédérale de Lausanne (EPFL) *Lausanne, Switzerland*

Computer Vision Research Intern, Summer@EPFL *2021*

- Conducted research to learn articulated object models from video using 3D optical flow and depth estimates.

Wadhwani Institute for AI *Mumbai, India*

AI Research Fellow *2018-2020*

- Built a 3D vision system to screen low birth-weight babies with smartphone cameras for public health sectors in rural India.
- Developed a novel method to reconstruct 3D infant meshes at metric scale.

Microsoft Research *Bengaluru, India*

Applied ML Intern *2018*

- Built a classifier to identify rare personally identifiable information for GDPR-compliance.

Academic Research Experience

Carnegie Mellon University - Dept. of Machine Learning

Advisors: Dr. Kun Zhang, Dr. Jeff Schneider

- Learning causal representations from high-dimensional and unstructured data (e.g., videos) with a focus on:
  - robust and accurate multimodal generation,
  - identifiable modeling of sequences of events.
- Developing novel language-grounded foundation models for scientific discovery and experimental design (planning) with applications in data-driven nuclear fusion research and tokamak control.

University of British Columbia - Dept. of Computer Science

Advisor: Dr. Danica J. Sutherland

- Developed a novel fair representation learning method using statistical two-sample testing.
- Developed a kernel-based measure of conditional independence to learn conditionally invariant deep representations.

Voluntary Service

Peer Review

- Conference on Neural Information Processing Systems (**NeurIPS**): 2024
- Conference on Artificial Intelligence and Statistics (**AISTATS**): 2023

Teaching Experience

Fall 2025	**Machine Learning in Practice**, Teaching Assistant, CMU
Fall 2022	**Intelligent Systems**, Teaching Assistant, UBC
Spring 2021	**Intelligent Systems**, Teaching Assistant, UBC
Spring 2017	**Computer Vision**, Teaching Assistant, IIIT-D
Fall 2016	**Advanced Programming**, Teaching Assistant, IIIT-D