Namrata Deka

PhD Student · Machine Learning

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Summary ___

I am a Machine Learning Ph.D. student at Carnegie Mellon University. My research spans the intersection of machine learning, reinforcement learning, computer vision and causality for learning robust representations from multi-modal time-series data. I am proficient in Python and work extensively with deep learning frameworks like PyTorch and Tensorflow. **Actively seeking student research internships starting May 2025.** I have a permit to work full-time in Canada (PGWP) and can obtain authorization to work in the USA (CPT).

Education _____

Carnegie Mellon University

Ph.D., Machine Learning

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

· Dissertation: TBD

University of British Columbia

M.Sc., COMPUTER SCIENCE

Vancouver, BC, Canada 2020 - 2023

Pittsburgh, PA, USA

2023 - 2027 (expected)

- · 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

2013 - 2017

B.TECH., COMPUTER SCIENCE AND ENGINEERING

• Honors thesis/undergrad research advisor: Dr. Saket Anand, Dr. Sanjit K. Kaul

Publications _____

PEER-REVIEWED CONFERENCES

- R. Pogodin*, **N. Deka***, Y. Li*, D.J. Sutherland, V. Veitch, A. Gretton. 2023. Efficient Conditionally Invariant Representation Learning. 11th International Conference on Learning Representations (**ICLR**). (Oral/Top 5%). *Equal Contribution.
- **N. Deka**, D.J. Sutherland. 2023. MMD-B-Fair: Learning Fair Representations with Statistical Testing. In Proceedings of the 26th International Conference on Artificial Intelligence and Statistics (**AISTATS**). (Poster).

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. 2024. NurtureNet: A Multitask Video-based Approach for Newborn Anthropometry. 7th **CVPR** Workshop on Computer Vision for Physiological Measurements (CVPM). (Best Paper).
- **N. Deka**, D. Sutherland. 2022. Learning Privacy-Preserving Deep Kernels with Known Demographics. In Proceedings of the 36th **AAAI** Conference on Artificial Intelligence. Workshop on Privacy-Preserving Artificial Intelligence (PPAI).
- D. Sutherland, N. Deka. 2022. Unbiased estimators for the variance of MMD estimators. Technical report.

Professional Experience _

- 2023 Machine Learning Researcher, University of British Columbia
- 2022 Machine Learning Research Intern, Borealis Al
- 2021 Summer@EPFL Research Fellow, École Polytechnique Fédérele de Lausanne (EPFL)
- 2018-2020 Machine Learning Research Fellow, Wadhwani Institute for Artificial Intelligence
 - 2018 Applied Research Intern, Microsoft Research

Academic Research Experience _____

Carnegie Mellon University - Dept. of Machine Learning

Pittsburgh, PA

ADVISOR: DR. KUN ZHANG, DR. JEFF SCHNEIDER

Sep. 2023 - Present

- Working on causal representation learning from high-dimensional and unstructured data (eg. videos) specifically for robust and accurate generative modelling.
- Investigating methods in causality and reinforcement learning to learn state-action dynamics that are robust to distributionshifts and shortcuts.
- Developing multi-modal foundation models (including LLMs) for scientific discovery and experimental design with a focus on data-driven nuclear fusion research and tokamak control.

University of British Columbia - Dept. of Computer Science

Vancouver, BC

ADVISORS: DR. DANICA J. SUTHERLAND

Sep. 2020 - April 2023

- Conducted research in the intersection of representation learning and kernel methods.
- Developed a novel fair representation learning method using statistical two-sample testing.
- Developed kernel measures of conditional independence to learn counter-factually invariant deep neural representations.

Talks and Presentations _____

April 2023. MMD-B-Fair: Learning Fair Representations with Statistical Testing. Conference Poster Presentation. 26th International Conference on Artificial Intelligence and Statistics, Valencia, Spain.

November 2019. *Neonatal Anthropometry and Growth Tracking via model based 3D Reconstruction from Video*. Seminar Talk. Perceiving Systems Department, Max Planck Institute for Intelligent Systems, Tübingen, Germany.

Teaching Experience _____

Fall 2022	Intelligent Systems, Teaching Assistant, University of British Columbia	Vancouver
Spring 2021	Intelligent Systems, Teaching Assistant, University of British Columbia	Vancouver
Spring 2017	Computer Vision, Teaching Assistant, Indraprastha Institute of Information Technology	New Delhi
Fall 2016	Advanced Programming, Teaching Assistant, Indraprastha Institute of Information Technology	New Delhi

Service and Outreach ___

COMMITTEE MEMBERSHIP

2024 Al Institute for Societal Decision Making, CMU, Student Leadership Council

Pittsburgh, PA

PEER REVIEW

- NeurIPS 2024
- AISTATS 2023