

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, causality, reinforcement learning and computer vision for learning robust representations and generative time-series models. I am proficient in Python and work extensively with deep learning frameworks like PyTorch and Tensorflow.

Education

Carnegie Mellon University

Pittsburgh, PA, USA

PH.D., MACHINE LEARNING

2023 - present

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

University of British Columbia

Vancouver, BC, 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 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. Annavaajjala, 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 Multi-task 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 AI

2021 **Summer@EPFL Research Fellow**, École Polytechnique Fédérale de Lausanne (EPFL)

2018-2020 **Machine Learning Research Fellow**, Wadhvani 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

- Exploring causal representation learning from high-dimensional and unstructured data specifically for robust and accurate generative modelling.
- Investigating methods in causality and reinforcement learning to learn distributionally-robust state-action dynamics from time-series data.
- 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 **AI Institute for Societal Decision Making, CMU**, Student Leadership Council

Pittsburgh, PA

PEER REVIEW

- AISTATS 2023