SNEH PANDYA

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SUMMARY

I am a third-year Ph.D. candidate in the Department of Physics at Northeastern University and a junior researcher at the NSF Institute for Artificial Intelligence and Fundamental Interactions. I am also a member of the Dark Energy Science Collaboration. My research interests broadly lie at the intersection of machine learning and cosmology, particularly for particle cosmology and weak gravitational lensing. I am interested in incorporating physical symmetries into neural networks to enhance their robustness and generalizability, as well as employing statistical machine learning techniques in my research. That being said, I am a devout Bayesian. Prior to pursuing my Ph.D., I applied machine learning techniques to astrophysical problems, including the estimation of supermassive black hole masses.

EDUCATION

Northeastern University *2021-Present*
Ph.D., Physics
Advisors: Jim Halverson & Jonathan Blazek
Expected Graduation: May 2026

University of Illinois at Urbana-Champaign 2017-2021
B.S., Physics, Minors in Mathematics & Astronomy *GPA: 3.79/4.00*
Treasurer of Sigma Nu Fraternity

PAPERS

S. Pandya*, J. Halverson. On the Generality and Persistence of Cosmological Stasis. arXiv:2408.00835.

S. Pandya*, Y. Yang, N. V. Alfen, J. Blazek, R. Walters. Learning Galaxy Intrinsic Alignment Correlations. ICLR 2024 Data-centric Machine Learning Research. arXiv:2404.13702.

S. Pandya*, P. Patel*, F. O., J. Blazek. E(2) Equivariant Neural Networks for Robust Galaxy Morphology Classification. NeurIPS 2023 Machine Learning for the Physical Sciences. arXiv:2311.01500.

S. Pandya*, J. Lin*, D. Pratap, X. Liu, M. Kind, V. Kindratenko. AGNet: Weighing Black Holes with Deep Learning. Monthly Notices of the Royal Astronomical Society, 2022. arXiv:2108.07749

S. Pandya*, J. Lin*, D. Pratap, X. Liu, M. Kind. AGNet: Weighing Black Holes with Machine Learning. NeurIPS 2020 Machine Learning for the Physical Sciences. arXiv:2011.15095

SCHOOLS & WORKSHOPS

IAIFI PhD Summer School and Workshop (**Organizer**) ..... *August 2024*
IAIFI PhD Summer School and Workshop (**Organizer**) ..... *August 2023*
IAIFI PhD Summer School and Workshop ..... *August 2022*
Princeton Deep Learning Theory Summer School ..... *July 2021*

CONFERENCES & PRESENTATIONS

Tufts University, *Oral Presentation* **(Invited)** 2024
Fermilab Surveys Meeting, *Oral Presentation* 2024
Neural Information Processing Systems (NeurIPS) Workshop, *Poster* 2023
Mathematical Physics Days, *Oral Presentation* **(Invited)**Video) 2021
Illinois Astrofest, *Poster* (**1st Place**) 2021
Neural Information Processing Systems (NeurIPS) Workshop, *Poster* (Video, Poster) 2020
Illinois Undergraduate Research Symposium, *Poster* (Video, Poster, Press) 2020

OUTREACH

Northeastern University, *Seminar*, "Machine Learning, Neural Networks, & All That" 2022
Urbana High School, *Lecture*, "Black Holes & AI" 2020
John Hersey High School (JHHS), *Lecture*, "Black Holes & AI" 2020

WORK

SPIN Intern & NSF REU Fellow August 2019 - May 2021
National Center for Supercomputing Applications *Urbana, IL*

· Utilized HAL supercomputing cluster to accelerate neural network training time, execute data simulation pipeline to expand training data set, and create informative visualizations for a general audience.

AWARDS & RECOGNITON

Fiddler Innovation Undergraduate Fellowship Award 2021
National Center for Supercomputing Applications *Urbana, IL*

· $1500 awarded to undergraduate students showing outstanding contributions during the Summer 2020 REU Inclusion program. The Fiddler Fellowship award is part of a $2 million-dollar endowment from Jerry Fiddler and Melissa Alden to the University of Illinois in support of student and faculty interdisciplinary research initiatives through the Illinois' Emerging Digital Research and Education in Arts Media (eDream) Institute at NCSA.

SERVICE & TEACHING

International Conference on Learning Representations (ICLR) 2023
Reviewer for the ICLR-DMLR workshop

Conference on Neural Information Processing Systems (NeurIPS) 2022, 2023
Reviewer for NeurIPS-AI4Science workshop

International Conference on Machine Learning (ICML) 2022
Reviewer for the ICML-AI4Science workshop

Department of Physics 2021-2023
Northeastern University *Boston, MA*

· Teaching assistant, PHYS 1148 Physics for Life Sciences Lab
· Teaching assistant, Physics for Engineering Discusssion
· Teaching assistant, PHYS 1152 Physics for Engineering Lab
· Teaching assistant, Graduate Computational Physics
· Teaching assistant, Undergraduate Computational Physics

Other: photographer, concert-goer, washed-up tennis player, record-collector