SNEH PANDYA

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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*
Member of Sigma Nu Fraternity

SELECTED RESEARCH

Junior Researcher, NSF IAIFI January 2022 - Present
Boston, MA

· Member of IAIFI Summer School and Workshop Organization Committee. Studying machine learning and cosmology.

Research Assistant, High Energy Theory Group March 2021 - September 2021
Prof. Yonatahn Kahn *Urbana, IL*

· Executed numerical simulations using PyTorch to analyze the statistics of preactivations in a neural network to see how the choice of initialization distribution of neurons affects the network output.

Research Assistant, Galaxy & Black Hole Astrophysics Group March 2019 - May 2021
Prof. Xin Liu *Urbana, IL*

· Developed effective machine learning algorithms and feature engineering pipeline to weigh supermassive black holes using observational data from the Sloan Digital Sky Survey.

Research Assistant, Nuclear Physics Group June 2020 - September 2020
Prof. Douglas Beck *Urbana, IL*

· Investigated magnetic field interactions for spin and higher number particulate systems in the context of quantum "squeezed" states to retrieve the dynamics for arbitary spin particles.

PUBLICATIONS

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

CONFERENCES & PRESENTATIONS

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

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

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

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

Department of Physics 2021-2022
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

Youth Outreach
I gave several lectures to physics students at high schools in Illinois on career paths in physics and the intersection of artificial inteligence and physics research.

RELEVANT ADVANCED COURSEWORK

Statistical Field Theory (Tong)
General Relativity (Carroll)
Complex Analysis
Applied Statistics with R
Cosmology (Sparke & Gallagher)

SKILLS

Programming: Python (PyTorch, sklearn, Pandas, AstroPy), RStudio
Software: Mathematica, GitHub, LaTeX
Other: photographer, concert-goer, washed-up tennis player, intramural table tennis athlete