MANISH SHANKLA

shankla2 [at] illinois.edu ⋄ www.linkedin.com/in/manishshankla ⋄ mshankla.com

EXPERIENCE

Alek Aksimentiev Lab PhD Research Assistant Sep. 2014 - Dec. 2019

- Developed a $>10^5$ times more efficient DNA sequencing delivery system. (Nature Nano. Cover Sep. 2019)
- Wrote CPU-parallelized stochastic/Monte-Carlo simulations to model DNA transport.
- Crafted data pipelines on HPC supercomputers to simulate hundreds of physics simulations, extract data, and perform down-stream analysis using statistical and machine learning methods.
- Developed image denoising and feature identification pipeline to identify DNA molecules.
- Authored 7 publications, including 2 first-author in Nature sub-journals, with over 165 citations.
- Acquired $350,000 of CPU/GPU hours on XSEDE/Bluewater supercomputers.
- Organized remote collaborations with research groups over 2 years resulting in 2 successful publications.

Dept. of Physics Teaching Assistant Sep. 2014 - Dec. 2019

- Lead class sizes of $\sim$30 students in Electronic Circuits, Classical Physics and Electromagnetism courses.

SKILLS

Programming Languages	Python, Bash, R, C++
Machine Learning Frameworks	PyTorch, scikit-learn, XGBoost, OpenCV
Workflow	Linux, HPC clusters, MPI4PY, SLURM, TORQUE, Git, SVN, Apache Spark

SELECT PROJECTS

Image-to-Image translation varying generator architectures and loss functions Dec. 2019

- CycleGAN extension with a Wasserstein (WGAN) loss and varying generator architecture.

Evolutionary CycleGAN May 2019

- An evolutionary algorithm selects an optimal loss functions during training.

Biomolecule Delivery on 2D Materials June 2019

- Efficient nanoscale DNA/Protein delivery system

Molecular gymnastics of DNA through Graphene pores January 2015

- Electrically flossing DNA through membrane pores.
- Classified never-before-seen DNA shapes on charged graphene.

EDUCATION

University of Illinois at Urbana-Champaign *Sep. 2014 - Dec. 2019*
PhD Computational Biophysics
Select Coursework: Machine Learning, Deep Learning, Computer Vision, Applied Regression, Data Science

University of Illinois at Urbana-Champaign *Sep. 2007 - May 2012*
BS Physics; minor: Computer Science

AWARDS/LEADERSHIP

Biophysics Symposium Best Talk Nov. 2019

- Awarded best symposium out of 20 speakers.

Oxford Nanopore Technologies Travel Fellowship June 2018

- Invited talk at the Bremen Nanopore conference.

Community Outreach Dec. 2019

- Designed and taught interactive science lessons at a bilingual elementary school. (2014-2019).
- Co-wrote and taught computational modeling tutorials at Summer School workshops (2014-2019).

Center for the Physics of Living Cells Conference organizer Fall. 2017

- Coordinated and chaired an academic conference with participants from several universities.