

ABISHRANT PANDAY

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EDUCATION

HARVARD UNIVERSITY
Cambridge, MA
May 2021 [May 2022]

A.B. CANDIDATE IN MATHEMATICS SECONDARY IN ECONOMICS [MASTER'S CANDIDATE IN CS]

Relevant Coursework Math 55A: Studies in Algebra and Group Theory, Math 55B: Studies in Real and Complex Analysis, CS 281: Graduate Machine Learning, CS 223: Random Processes and Algorithms, CS 124: Data Structures and Algorithms, Economics 2099: Market Design, Math 129: Number Fields, Math 136: Differential Geometry, Physics 16: Mechanics and Special Relativity, Physics 153: Electrodynamics

Organizations/Interests HackHarvard (Co-director, partnerships team), Harvard-MIT Math Tournament (Problem writer, spokesperson), Harvard Datamatch (algorithms team), Harvard Computer Society, Harvard Radio (WHRB)

GPA: 4.0/4.0 (UNWEIGHTED) SAT: 800 Math, 800 Reading, 22/24 Written

Relevant Coursework AP BC Calculus, AP Chemistry, AP Physics: Mechanics and Electricity & Magnetism, Organic Chemistry, Micro/Macro Economics, AP Computer Science A

Extracurricular Activities Science Olympiad (Founder and Captain), *The Leading Strand* (Editor-in-chief), Science Bowl (Captain), Math Team (Captain), *The Observer* (Staff Writer), I-Help Liberia (President)

Awards High School National Championship Tournament (1st place), Scholastic Art & Writing Awards (National Silver Medal, 5x Regional Gold), 2017 Siemens Competition Semifinalist, NYC Science & Engineering Fair (2nd place in CS), Moody's Mega Math Challenge (Top 78/1121 Papers), 2x AIME

Hunter College (Dual Enrollment) GPA 4.0/4.0, Calculus III with Analytic Geometry, Vector Analysis, Linear Algebra, Differential Equations

HUNTER COLLEGE
HIGH SCHOOL
New York, NY
Jun 2018

EXPERIENCE

LABORATORY OF
NANOSCALE OPTICS
Harvard University
Jan 2019 - Present

MACHINE LEARNING AND QUANTUM-OPTICS RESEARCHER

- Currently working in the laboratory of Dr. Marko Loncar to apply machine learning and inverse design principles towards the development of fabrication in photonic crystals.
- Researching SiV centers in diamond nanocavities as a method of developing multi-node quantum networks
- Created a computational model of SiV centers in order to study the effects of mechanical stress on cavities

THE GARCIA CENTER
Stony Brook University
Jun - Sep 2017

MATERIALS SCIENCE AND ENGINEERING RESEARCHER

- Worked in the laboratory of Dr. Miriam Rafailovich
- Developed a polymer solar cell active layer with enhanced morphology through the addition of PMMA
- Created model of light absorbance and reflectance within the cell
- Created method of increasing active layer thickness while maintaining efficiency through additive-induced columnar self-assembly

LABORATORY OF
MUCOSAL IMMUNOLOGY
Rockefeller University
Jun - Dec 2016

IMMUNOLOGY RESEARCHER

- Worked in the laboratory of Dr. Daniel Mucida and Dr. Bernardo Reis
- Studied T-cell receptors found within intestinal lymphocytes in *Mus musculus*
- Developed an extracellular method of studying intraepithelial lymphocyte and intestinal epithelial cell interactions *in vitro* and demonstrated efficacy of model in pathogen and drug trials

SKILLS

Python (ML/Data Science)
Java
C/C++
Molecular Modeling
JS (React/Angular)
HTML5, CSS, Bootstrap
MATLAB
Nanofabrication

PROJECTS

NEURAL TRANSLATION AND EVOLUTIONARY MULTI-AGENT NETWORKS FOR PROTEIN STRUCTURE PREDICTION

- Developed new computational approaches to predict the three-dimensional structure of proteins.
- Designed multi-agent networks and evolutionary algorithms that determined 3-D protein structure *ab initio*.
- Created a neural-machine translation model to determine protein secondary structure.

MODELING THE EFFECT OF CLIMATE CHANGE ON THE NATIONAL PARK SERVICE

- Honorable mention (Top 78/1121) paper in the 2017 MathWorks Math Modeling Challenge
- Worked in a team to find independent data sets and create model combining sea level rise, erosion, temperature, and human activity in order to account for the likelihood and severity of climate-related events on National Parks within the next 50 years.

PMMA ADDITIVE-INDUCED ACTIVE LAYER SELF-ASSEMBLY IN POLYMER SOLAR CELLS

- Semifinalist in 2017 Siemens Competition in Math, Science, and Engineering
- Conducted research at Stony Brook University and Brookhaven National Labs; created an organic polymer solar cell active layer with higher external quantum efficiency and ability to be mass produced

IN-VITRO MODEL FOR INTERACTIONS BETWEEN IEL'S AND INTESTINAL EPITHELIAL CELLS

- Final external system enabled the investigation of interactions within epithelium without live specimen and allowed for research into immune response pathways

MODELING THE SPREAD OF ZIKA THROUGH TWITTER ANALYSIS

- New York City Science and Engineering Fair 2nd place in computer science, JSJS Semifinalist
- Worked in a team of two to develop a computational model aimed at predicting locations of future Zika virus outbreaks; tested efficacy against airline data