ABISHRANT **PANDAY**

(+1) 347-235-7937 | abi.panday@alumni.harvard.edu | abishrantpanday.com | abishrantpanday | Saffr0n1

EDUCATION

HARVARD UNIVERSITY
Cambridge, MA
May 2022

A.B. IN MATHEMATICS, M.S. IN COMPUTER SCIENCE GPA: 3.9/4.0

Thesis The Asymptotic Behavior of the Stable Marriage Problem in Symmetric Markets
Relevant Coursework Math 55A: Honors Linear and Abstract Algebra, Math 55B: Honors Real and Complex Analysis, Math 231A: Graduate Algebraic Topology, CS 223: Probabilistic Analysis and Algorithms, CS 226R: Algorithmic Fairness and Differential Privacy, CS 229R: Error Correcting Codes, CS 234R: Computation in Networks and Crowds, CS 238: Optimized Democracy, CS 281: Advanced Machine Learning
Projects CS 238: GAErryChain, Improving MCMC Random Walk Sampling With GAEs, CS 242: FP32 Homomorphic Encryption and Central Server Commitment Schemes for Federated Learning, CS 234: Network Diffusion With Conflicting Parties, CS 281: Neural Machine Translation and Multi Agent Networks for Protein Structure Prediction, CS 223: Iterative Skyline Computation Through Noisy Comparisons, CS 226R: Algorithmic Fairness in Post-Processed Toxicity Text Classification, APCOMP 275: Characterization of Cs(Pb/Ti)X3 Perovskites, Econ 2099: Economic Inefficiencies in Prison Labor Programs
Organizations HackHarvard, Harvard-MIT Math Tournament, Harvard Computer Society, Harvard Asian American Dance Troupe, Harvard Radio (WHRB), Student Astronomers at Harvard-Radcliffe (STAHR)

HUNTER COLLEGE HS
New York, NY
Jun 2018

GPA: 4.0/4.0 SAT: 800 MATH, 800 READING, 22/24 WRITING

Awards High School National Champtionship 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)
Organizations Science Olympiad, The Leading Strand, Science Bowl, Math Team, The Observer, I-Help Liberia

EXPERIENCE

AKUNA CAPITAL
Chicago, IL
Aug 2022 - Present

QUANTITATIVE TRADER
- Research, development, and implementation of high-frequency futures trading strategies on the Delta One team
- Market microstructure research into triggers for futures takeout, active quoting, and confirmation quoting strategies
- Rates-and-rolls infrastructure and research along with options strategies; experience with options theory and trading
- ML research and low-latency C++

CELSIUS
New York, NY
Nov 2021 - Apr 2022

DEFI RESEARCHER
- Implementation of cross-chain bridging protocols between Ethereum and Polygon
- Solidity, JavaScript

ALLIANCE BERNSTEIN
New York, NY
May 2021 - Aug 2021

QUANTITATIVE RESEARCH INTERN
- Modeling and creation of internal tools for predicting intraday trading volume and institutional traded volume on select stocks, indices
- Real-time algorithms for identifying stocks with high retail volume.
- Python, MySQL, C#, kdb+

AXON
Seattle, WA
May 2020 - Aug 2020

SOFTWARE ENGINEERING INTERN
- Backend development for AXON's Evidence line of products in order to enable effective communication, data processing, and handling of police and emergency responders
- Java, Ruby, MySQL

HARVARD UNIVERSITY
Cambridge, MA
Jan 2019 - May 2022

MACHINE LEARNING AND QUANTUM OPTICS RESEARCHER
- Laboratory of Dr. Marko Loncar. Machine learning and inverse design principles towards improving waveguide design for silicon vacancy (SiV) centers in diamond nanocavities, which are used to develop multi-node quantum networks

RESEARCH

DETERMINISTIC CREATION OF STRAINED COLOR CENTERS IN NANOSTRUCTURES VIA HIGH-STRESS THIN FILMS [2023]
- Creation of statically strained silicon-vacancy color centers by combining high-stress silicon nitride thin films with diamond nanostructures
- Allows for the operation of silicon-vacancy centers at elevated temperatures (1.5K) without any degradation of their spin properties
- Contribution in modeling and initial fabrication

GAERRYCHAIN: IMPROVING MCMC RANDOM WALK SAMPLING WITH GAES [2021]
- Improved on Markov Chain Monte Carlo sampling algorithms for gerrymandering detection by employing a graph auto-encoder architecture
- Showed significant computational improvements as well as the ability to generate semi-contiguous districts

NETWORK DIFFUSION WITH CONFLICTING PARTIES [2021]
- Created and implemented a model for network propagation in the presence of two parties and explored its dynamics, including optimal seeding strategies and budget constraints
- Determined the effectiveness of several heuristics on the Facebook ego graph dataset

ALGORITHMIC FAIRNESS IN POST-PROCESSED TOXICITY TEST CLASSIFICATION [2020]
- Studied the effect of switching stochastic gradient descent (SSGD) algorithm on the Jigsaw Unintended Bias in Toxicity Classification dataset
- Constructed similarity and distance metrics and showed their effectiveness in determining individual fairness. Demonstrated the effectiveness of using the post-processing SSGD algorithm proposed in literature to enforce a proxy for individual and group fairness on the task of text classification with sensitive labels

NEURAL TRANSLATION AND EVOLUTIONARY MULTI-AGENT NETWORKS FOR AB INITIO PROTEIN STRUCTURE PREDICTION [2019]
- Developed new computational approaches for the protein structure prediction (PSP) problem based on neural machine translation and multi-agent evolutionary algorithms on cubic lattices. Approaches developed using amino acid residue and structure information from the Protein Data Bank and ProteinNet12 databases
- Created ProteinSearch, which builds on RNNsearch and uses bidirectional encoding, decoding to model inter-residue dependence within secondary structure conformation
- Created MultiFold, a multi-agent evolutionary algorithm, which determines spatial protein conformations with lowest global energy

SKILLS

LANGUAGES Python, C++, C, Rust, Haskell, OCaml, Solidity
EXPERTISE Machine Learning, Low-Latency C++, Algorithm Design, MMS, Futures-Trading Strategies