

Ajay Dheeraj

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Education

Duke University

Durham, NC

B.S. in Computer Science and Mathematics, GPA: 3.88/4.00

Expected May 2021

Activities: Duke Math Union (vice-president), Duke ACM Chapter, Duke Go Club (founder), Duke Chronicle

Relevant Coursework: Design and Analysis of Algorithms, Computer Vision (grad-level), AI (grad-level), Statistics, Probability, Cryptography, Operating Systems, Computer Architecture

Skills

Languages Python, Java, C, Javascript, R

Technologies and Frameworks Express/Node.js, Angular, Apache Spark, Kubernetes, Git

Experience

Citadel Securities

Chicago, IL

Incoming Trading Intern

May 2020 - Aug 2020

IBM

Research Triangle Park, North Carolina

Software Engineering Intern

May 2019 - Aug 2019

- Developed full-stack features in Angular/Node and enhanced performance of a taxonomy app that visualizes and analyzes hierarchical structures for internal data analytics
- Converted operations to Python/Spark scripts and helped deploy app on a Spark Cluster using serverless frameworks, improving query retrieval and method runtimes by over 40%
- Continued integration of app with Enterprise Performance Management team pipeline to help standardize data features across revenue streams, supplanting internal competitor as main visualization tool for team

Research Intern, Duke Opportunity in Mathematics 2018

May 2018 - Aug. 2018

- Conducted collaborative machine-learning research for eight weeks on non-linear dimension reduction using diffusion map technique
- Developed robust kernel function that improved upon existing kernels by reducing parameters but maintaining accuracy using a k-nearest neighbors approach
- Studied convergence rate of this kernel to Laplacian operator, numerically implemented algorithm in MATLAB, and tested kernel on handwriting data, yielding 95% accuracy in digit differentiation

Projects

Quadratic Sieve, Mathematical Cryptography

April 2019

- Numerically implemented quadratic sieve factoring algorithm from original paper and placed second in class contest for performance (able to factor 30+ digit numbers quickly)
- Developed in team with Python/NumPy, using computational optimizations related to sparse matrix representations, low precision logarithms, and modular square roots

SmartAir, HackDuke 2017

Oct 2017

- Built React Native app with team that monitors outside air quality in real-time based on location data
- Remotely controls on-premise car using SmartCar SDK, depending on user-set air quality thresholds
- Implemented through a REST API/Python+Flask backend with OAuth2 token authentication

Credit Sesame Data Analysis, Duke Datathon 2018

Oct 2018

- Placed sixth in team competition to analyze and derive value from massive financial data sets
- Developed logistic regression model with TensorFlow that predicted at-risk-of-bankruptcy users with 89% accuracy, and identified states that were geographically under-represented as targets for service expansion

Honors

- United States of America Computing Olympiad - Gold Division
- 2018 Citadel Quantitative Trading Challenge - 2nd place
- American Invitational Mathematics Examination Qualifier
- 2019 Putnam Examination - Top 17%