Ajay Dheeraj

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Education

Duke University **Durham, NC**
*Bachelor of Science in Mathematics and Computer Science, **GPA**: 3.88/4.00* *Expected May 2021*
Activities: Duke Math Union (president), Duke ACM/ICPC, Duke Go Club (founder), Chronicle Newspaper
Relevant Coursework: Linear Algebra and Applications, Advanced Introduction to Probability, Mathematical Statistics, Artificial Intelligence (grad-level), Design and Analysis of Algorithms, Operating Systems

Budapest Semesters in Mathematics **Budapest, Hungary**
Mathematics, Honors *Jan 2020-May 2020*

Skills

Languages Python, Java, C, R, Javascript *Frameworks* Express/Node.js, Angular, Apache Spark

Experience

Citadel Securities **Chicago, IL**
Trading Intern *June 2020 - Aug 2020*

IBM **Research Triangle Park, NC**
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*

- Implemented quadratic sieve factoring algorithm from original paper and placed second in class contest for performance (able to factor 20+ digit numbers quickly)
- Developed in team with Python/NumPy, using computational optimizations related to sparse matrix representations, low precision logarithms, and modular square roots

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

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

Honors

- United States of America Computing Olympiad - Gold Division
- 2018 Citadel Quantitative Trading Challenge at Duke University - 2nd place
- 2019 Putnam Competition - Top 600
- Prize winner at HackGT 4: New Heights, SpaceApps NextGen Hackathon
- American Invitational Mathematics Examination Qualifier