Nithin Raghavan

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EDUCATION

University of California, Berkeley (Class of 2020)   *Aug 2017 – present*
Computer Science *Bachelor of Arts*, Applied Mathematics *Bachelor of Arts*   (*GPA: 3.67*)

- CS170: Efficient Algorithms
- EE127: Optimization Models and Applications
- IEOR 221: Intro Financial Engineering (current)
- Math 128a: Numerical Analysis
- Math 126: Partial Differential Equations
- CS189: Introduction to Machine Learning

Georgia Institute of Technology   *Aug 2015 – May 2017*
Courses taken while in high school

- Math 3012: Applied Combinatorics
- Math 2803: Number Theory and Cryptography

EXPERIENCE

→ **Samsung Advanced Computing Lab**   *May 2019 – Aug 2019*

- Conducted extensive research on the potential routes of optimization and quantization of deep learning models such as MobileNet, R-FCN, SRCNN and ESRGAN as part of Samsung's GPU team
- Researched the graphics pipeline and became acquainted with AMD's compute and graphics architecture, and wrote + ran 2D register-blocked GEMM kernels with increased WPT in OpenCL on AMD architecture
- Wrote and trained two neural networks; the first to perform ambient occlusion on complex OpenGL-rendered scenes, and the second to convert a flat-rendered scene to a lifelike, physically based rendered one

→ **Mobile Sensing Lab, UC Berkeley**   *Oct 2018 – Present*

- Currently writing code implementing a parallelized Frank-Wolfe algorithm for dynamic traffic assignment using contraction hierarchies in C++ and CUDA
- Helping research the impact of different optimization models of routing behaviour on the Waze traffic problem

→ **RISE Lab, UC Berkeley**   *Jun 2018 – Dec 2018*

- Designed and implemented a data visualization tool for Jupyter Notebook for hyperparameter optimization for Cirrus, a serverless machine learning framework
- Helped write code to spawn AWS Lambdas that parallelize training of models like logistic regression

PROJECTS

→ **Resource-Provisioning GPU Server**   *Dec 2017 – present*

- Developed a shell in Python automating on-demand request processing + resource provisioning in GPU cluster
- Collaborated on a team to create a program that utilizes Slurm for cluster management and deploys tasks in Docker containers

→ **Software Renderer**   *Jul 2019*

- Developed a software-based rasterizer and renderer with pixel and vertex shader support in C++, and increased its runtime with block-based rasterization
- Renders with SDL, and is capable of barycentric interpolation, backface culling and texture mapping

→ **LASSO/Wavelet Based Compressed Sensing Algorithm**   *Jul 2019*

- Lossily compresses audio/images by computing LASSO on the matrix-vector product representation of the discrete wavelet transform of the input signal
- Uses orthogonal Daubechies wavelets, and preprocesses data for ML training

SKILLS

Awards: Exploravision National Contest   *2016*

- Wrote a paper proposing blockchain's potential link to autonomous vehicles, and won honorable mention.

Models/Algorithms: Regression/classification (ridge, logistic, SVM, decision trees, OLS), PCA/SVD, ensemble learning, k-means, deep learning (CNNs, LSTMs, GANs), Frank-Wolfe
Frameworks/Softwares: Numpy, Scipy, Pytorch, OpenCV, Docker, Slurm, d3js, OpenCL, OpenGL
Programming Languages: Python, Java, C, C++, C#, Bash, Latex, SQL, JavaScript, Matlab
Operating Systems: Unix-like systems (Linux, FreeBSD, Mac OS X), Windows
Certifications: Android Development (University of Maryland through Coursera)