

Vinayak Agarwal

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EDUCATION

Courant Institute of Mathematical Science, New York University, New York, USA	January 2021 - December 2022
Master of Science in Computer Science	GPA: 3.88/4.0
Manipal Institute of Technology, Manipal, India	July 2014 - July 2018
Bachelor of Technology in Information Technology	CGPA: 8.62/10

TECHNICAL SKILLS

- Programming Languages: C, C++, Java, Python, MySQL, Prolog, ML, Scheme
- Web and Cloud Technologies: CSS, JS, ReactJS, Django, NodeJS, Google Cloud Platform, Amazon Web Services
- Relevant Courses: Programming Languages, Big Data and ML Systems, Multicore Processors: Architecture and Programming, Operating Systems, Distributed Systems, Compiler Construction, Networks and Mobile Systems

PROFESSIONAL EXPERIENCE

Linkedin, Sunnyvale	June 2022 - August 2022
<i>Backend Systems and Infrastructure Engineer</i>	
- Improved existing video generation infrastructure to use fragmented mp4 as container format over mpeg-ts, improving client performance by reducing total bytes transferred by 10% for low resolution videos - Experimented with byterange media queries over fragmented mp4, and concluded single files reduced cache hit rates, increased server load and reduced access latency	
Amazon, Hyderabad, India	August 2018 - December 2020
<i>Software Development Engineer</i>	
- Migrated team's proprietary search framework to a combination of AWS DynamoDB and AWS Elasticsearch, improving overall service availability and improved mean response time by almost 3 times - Implemented a statistical moving average model as a fallback to an LSTM model used for package prediction for shipping products to customers, saving Amazon additional \$10000+/day - Led project to incorporate GDPR compliance for team's microservice, while working with multiple teams to get dependent data and successfully completing it	
Amazon, Hyderabad, India	January 2018 - July 2018
<i>Software Development Intern</i>	
- Launched microservice to a new region for country wide launch, which included full stack setup and applying region specific modifications, potentially reducing costs by \$10000+/month - Setup involved appropriate provisioning of resources based on usage patterns across regions and extrapolating patterns based on expected traffic - Purged old data from service tables in DynamoDB by utilizing TTL (Time to live) for various tables, deleting millions of unnecessary old records, saving thousands of dollars per month	

RESEARCH EXPERIENCE

New York University	June 2021 - Present
<i>Research Assistant, Under Professor Aurojit Panda</i>	
Performing research on "Video Fuzzing", a project on video analytics scheduling to conduct analysis on how video content affects video processing time, allowing scheduler to make more efficient resource allocations	

ACADEMIC PROJECTS

MARRIP: L3 Cache Replacement Algorithm	New York University
Designed a cache replacement algorithm based on DRRIP and studied its performance across varied workloads and access patterns	
SIDRF: Scheduling Algorithm for Clusters with Resource Hogs and Mice	New York University
Modified DRF to enhance algorithm in systems with varied workloads, resulting in significant performance boost for systems with resource hogs and mice	
BFDRR: Packet Scheduling Algorithm	New York University
Developed a packet scheduling algorithm based on deficit round robin that optimizes for bursty flows, improving performance and fairness across various topologies by upto 5% on ns-3	
Chocopy Compiler	New York University
- Implemented a compiler for a subset of Python- Chocopy in Java producing RISC-V assembly, supporting syntax checking, type inference, optimizing performance by reducing instruction count - Final project implementation was 4th fastest across 10+ teams	

AWARDS AND POSITIONS OF RESPONSIBILITY

- Grad Life Leader for academic year 2021-2022 at NYU, leading 10+ events across year
- Spot Award at Amazon for single handedly driving data backfill, alleviating customer inconvenience
- Application development head for university fests at Manipal, involving mentoring juniors in app development
- Co-Founder of Manipal Information Security Team, Manipal and Project Head at IEEE Student Branch Manipal