Sanjit Kumar

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EDUCATION:

University of Illinois Urbana-Champaign, *Master of Computer Science*   **GPA: 3.91/4.00** | Aug 2022–**May 2024**
 Relevant Coursework: Distributed Systems, OS Design, Fault Tolerant Data Center Systems, ML and Data Systems, Artificial Intelligence, Data Mining, Advanced Software Engineering Topics, Interactive Computer Graphics.

Vellore Institute of Technology, *Bachelor of Technology in Computer Science and Engineering*   **GPA: 3.85/4.00** | Jul 2018–**May 2022**
 Relevant Coursework: Data Structures and Algorithms, Database Management Systems, Object Oriented Programming, Web Programming, Computer Networks, Graph Theory and Social Networks, Parallel Programming.

SKILLS:

- **Programming Languages:** Python, C++, Java, C, Javascript, Go
- **Databases:** MySQL, MongoDB, Redis, Elasticsearch
- **Web Technologies:** ReactJS, Node.js, Express.js, PHP
- **Other Technologies:** Apache Kafka, Hadoop, Kibana, Docker, AWS, Linux Kernel, Bash, Data Plane Development Kit (DPDK), OpenGL, WebGL, PyTorch, Grafana, JavaFX.

EXPERIENCE:

University of Illinois Urbana Champaign, *Graduate Teaching Assistant*   **C++, Go| Jan 2024 – May 2024| Champaign, IL**
- Worked with Dr. Radhika Mittal on the course CS425: **Distributed Systems** to provide industry relevant lessons for 200+ graduate/undergraduate students. Held bi-weekly office hours and assessed homework and projects.
- Mentored students to build distributed & networked application projects (reliable multicasting, distributed transactions, raft).

Aviz Networks Inc, *Fall Software Engineer Intern*   **C, Python, Redis| Sep 2023 – Nov 2023| San Jose, CA**
- Developed and integrated a UI, REST API, and Redis DB Cache for a C-based Network Packet Collector for GTP Correlation.
- Worked with kernel-bypass strategies via Data Plane Development Kit to achieve packet processing speed for datacenter networks.
- Integrated an Apache Kafka module using Kafka-C drivers into the packet data processing pipeline, enhancing reliability.
- Optimized and performance-tuned the packet collector pipeline via payload batching. Achieved a 3x improvement in throughput and 50% reduction in latency.
- Automated the configuration, build and execution of the packet collector with Bash scripts and Python.

Aviz Networks Inc, *Summer Software Engineer Intern*   **C++, Python| May 2023 – Aug 2023| San Jose, CA**
- Designed and developed a C++ based scalable network packet analyzer system. System tapped packets from high throughput network traffic from data centers to extract and stream metadata information.
- Leveraged scalable event processing systems like Kafka and Elasticsearch for data pipelining and downstream analytics.
- Benchmarked scalability on physical network devices with software-based (Scapy) and hardware-based (Ixia) load generators.
- Used a Kafka consumer to integrate a REST API with the system for selective packet capture and data sink integrations.

WebKnot Technologies, *Full Stack Developer Intern*   **ReactJS, Node.js | Nov 2020 – Dec 2020 | Bangalore, India**
- Integrated custom Tensorflow-based object detection models with Shinobi, an open-source CCTV framework.
- Developed UI with ReactJS and wrote REST API endpoints with node.js and Express.js for two different MERN stack applications.

PROJECTS:

Distributed ML Inference Job Scheduler   **GitHub** | **Java, Python, PyTorch**
- Designed a distributed job scheduler system for ML inference tasks built on top of 10 Linux VMs from scratch using Java and Python.
- Uses a real-time work scheduling algorithm to optimize query rate for ResNet and ImageNet classification tasks.
- Includes a distributed data logging service, distributed group membership protocol and failure detector, a distributed files system.

Page Fault Profiler   **GitHub** | **C, Bash**
- A page fault profiler in the linux kernel space to profile major/minor page faults and cpu run times of user processes via a virtual shared memory buffer. Implemented regular sampling via delayed work queue and user process registrations via proc interface.

Modified Banker's Algorithm with Software Interrupts   **GitHub** | **C, Bash**
- Enhanced the Banker's Algorithm to simulate standard operations but also manage OS software interrupts with a circular queue. Implemented the algorithm using a multi-threaded approach with the POSIX library in C.

WildSprint: Wildlife Fundraising Platform (*1st Place Ethereum Track – DevSpace '20 Hack*)   **GitHub** | **Node.js, ReactJS, Solidity**
- Developed a MERN stack fundraising platform to raise funds via cryptocurrency (wrote smart contracts to receive ETH coin).
- Built a live stream feature through Dyte SDK integration. Livestreams of wildlife in national parks to incentivize donations.

RESEARCH EXPEREINCE:

Internet of Things Security: Attacks, Solutions, Strengths and Limitations   Link | **Sep 2021**
International Conference on Artificial Intelligence and Machine Vision, IEEE
- Presented a comparative analysis of benchmarks between latest security frameworks in then-recent IoT literature while advised by Dr. Anil Kumar Kakelli.
- Categorically classified and critiqued existing IoT security frameworks based on their approaches to address the threat of malignant nodes in heterogenous device networks and general strengths/limitations.