

RAVYU SIVAKUMARAN

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EDUCATION

Bachelors in Science, Computer Science — **University of Illinois at Urbana-Champaign**

📅 May 2023 GPA: 4.0/4.0

WORK EXPERIENCE

Undergraduate Research Assistant - Autonomous Vehicle Research

📅 Aug 2021 -

- Researching autonomous technology under Professor Talebpour to develop a self-driving car for a ride-share service in Rantoul
- Developing SLAM-based motion planning, object detection and control systems in ROS to implement self-driving software into a modified Jeep Cherokee
- Working with 30 researchers to achieve level-4 autonomy on rural roads through extensive data-collection, simulations, and real-life testing at the Illinois Center for Transportation to realize the safety and ubiquity of self-driving cars on national roads

Software Design Studio Course Assistant — **UIUC CS Department**

📅 Jan 2021 - May 2021

- Taught students on programming fundamentals: Object Oriented Programming (Java/C++), black box testing, build automation tools (Cmake)
- Assessed and graded students code on weekly projects, with an emphasis on strong programming practices (modularity, object decomposition, encapsulation, documentation, testing)
- Hosted weekly Code Review sessions to facilitate discussion on programming practices with students

Backend Developer — **CloudZen Pte., Ltd.,**

📅 Jan 2018 - Apr 2018

- Developed backend infrastructure for the Company's flagship project—Gamecloud. Setup a Leaderboard database (MongoDB + Redis) that is linked via API endpoints defined in Azure Functions
- Designed network pipeline for latency sensitive applications like game streaming over both cellular and WAN connections. Contributed to the UDP socket programming team
- Spearheaded virtualization infrastructure setup with focus on performance for gaming. The virtualization infrastructure was built on a KVM-based virtualization platform, with Proxmox used for cluster management

LEADERSHIP

Lead Programmer — **ACS(I) Robotics Club**

📅 Jan 2016 - Nov 2017

- Led club as head programmer during competitions (VEX Worlds, RoboCup). Coordinated weekly meetings leading up to the competitions, and guided junior members along the way
- Programmed microcontrollers in various instruction sets (ARM Cortex-M, Atmel AVR) in embedded C and assembly
- Designed custom circuit boards, experienced in soldering and EAGLE Design

Air Warfare Officer — **Singapore Armed Forces**

📅 Apr 2018 - Apr 2020

- Trained as Air Traffic Control (ATC) Officer; in charge of recovering air assets in the event of national emergencies
- Led ATC operations briefs on a weekly and daily basis and managed communication between various bases during day-to-day operations
- Completed service on April 10th with the rank of Lieutenant

PROJECTS

C++ Dependency Tracker — **Data Structures Final Project**

📅 Jan 2021 - May 2021

- Developed a tool that allows developers to visualize dependencies within their projects.
- Wrote a graph generator by running a depth-first search on a project source directory, creating edges based on file dependencies, which is then stored in an adjacency hash table.
- Delivered biweekly project reports, received a 99% score.

DSTA TIL 2020 — **Machine Learning + Robotics based Search and Rescue Competition**

📅 Jun 2020

- Trained a YOLOv4 based object detection model on the mnist data set to detect clothes
- Adapted model to a DJI Robomaster to autonomously identify and rescue targets based on clothes worn in a simulated disaster zone
- Finalist in University Category

Air Traffic Control Currency Tracker — **Republic of Singapore Air Force**

📅 Apr 2019 - Apr 2020

- Revamped Air Traffic Controller eligibility tracking system in Squadron to ensure controllers' skills remain current, thus preventing ineligible controllers from controlling
- The project made use of the Telegram Bot framework for the frontend and Google Apps Script (JavaScript) for the backend, with a focus on high-availability and security to meet operations-sensitive demands
- Presented monthly progress presentations to base commanders, showcasing product demo builds to clients with no technical experience

Open Source Initiative — **ACS(I) Robotics Club**

📅 Nov 2016 - Apr 2017

Led an initiative to switch to open source robotics platforms for use in Competitions.

- Conducted workshops on how to read instruction set manuals for Arduino (AVR) and datasheets for sensors/electronics, with an emphasis on appreciation for open source culture

- Taught basic computer architecture concepts (ALUs, registers, IO) to junior members
- Setup and maintained communication channels between the software team, hardware team and part suppliers

COURSEWORK

Algorithms and Models of Computation	Data Structures (C++)	Computer Architecture	Probability and Statistics
Applied Linear Algebra (Python)	Discrete Structures	Programming Studio (Java/C++)	Calculus I-III