

# Alex Kalams

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## Education

**University of Michigan College of Engineering**, Ann Arbor, MI

*Expected Graduation May 2024, B.S.E. in Computer Science, Minor in Music*

**GPA: 3.96**

**Relevant Coursework:** Programming and Intro Data Structures, Discrete Mathematics, Data Structures and Algorithms, Intro to Computer Organization (in progress), Foundations of Computer Science (in progress)

## Skills

**Programming Languages:** Proficient: C++ Familiar: Python, R, Java, Matlab

**IDEs:** Visual Studio, VS Code, R Studio, Jupyter Notebook, Eclipse

## Projects

### **Zoo Keeper (2021)**

- Implemented Prim's Algorithm and optimal solution to Traveling Salesman Problem
- Calculated shortest path connecting graphs of 10,000+ coordinates

### **Log Manager (2021)**

- Developed application that parses up to 100,000 log entries in less than 10 seconds
- Searched log entries by keyword and category quickly using hash tables

### **Zombie Survival Game (2021)**

- Used multiple priority queue data structures to efficiently manage 100s of zombie objects
- Implemented multiple versions of priority queues including binary heaps and pairing trees

### **Space Station Escape (2021)**

- Used 3D vector to store map of space station
- Created pathing algorithm using deque to find exit from space station

### **Piazza Post Classifier (2020)**

- Used machine learning to tag Piazza posts automatically based on their content
- Implemented binary search tree and map data structures using recursion
- Trained classifier on pre-tagged posts before using on up to 100 untagged posts

### **Topographic Mapping Drone (2020)**

- Programmed drone to fly through a maze and land at the end
- Measured altitude of ground below drone using ultrasound sensor
- Generated topographic maps in Matlab using altitude data

## Experience

### **Mentor: University of Michigan Hackblue (2020-Present)**

- Teach elementary schoolers basic coding concepts at after-school programs in underprivileged areas
- Mentor up to 20 students for a class once a week
- Develop curriculum including for languages like HTML and Scratch.

### **Intern: Vanderbilt Department of Bioinformatics (2019-2020)**

- Learned programming techniques in Python to query and understand large datasets
- Analyzed databank of 1 million+ patients to understand risk factors for different diseases
- Applied different statistical techniques such as logarithmic regression to determine correlative factors
- Wrote a research paper demonstrating my findings for causes of 5 cardiovascular diseases

## Leadership

### **Debate Coach and Judge: Montgomery Bell Academy (2019-Present)**

- Teach high school and junior high novice debaters basics debating concepts