

EDUCATION

Rice University, Houston TX, B.S. Computer Science (GPA 3.74) **Aug 2018 — May 2022**
Massachusetts Institute of Technology, Boston MA, Youth Entrepreneurship Program **June 2016 — July 2016**

WORK EXPERIENCE

Software Architecture Intern, Lutron, Austin TX **May 2021 — Aug 2021**

- Developed an easy to use, versatile and reusable graph data structure in Swift that can be used to build troubleshooting guides to solve different technical issues faced by customers trying to set up their home systems.
- My framework allowed engineers to rapidly build and incorporate a troubleshooting guide within their apps which has led to a 30% decrease in customer calls to the technical support hotline, freeing up resources for more pertinent issues.

Robotics Research Intern, Kavradi Lab, Houston TX **Jan 2021 — May 2021**

- Designed a novel robotic motion planning algorithm, Parallel Rapidly-Exploring Random Tree, that utilized multi-threading to calculate valid paths for autonomous robotic vehicles more quickly and efficiently.
- The algorithm was able to calculate a valid motion path for an autonomous vehicle navigating obstacles 2.35x faster than the traditional sequential version of the algorithm.

Computational Neuroscience Intern, Tandon Lab, Houston TX **May 2020 — Aug 2020**

- Built an automated system to reconstruct 3D vascular models of the brain from a patient's MRI images to aid neurosurgeons in planning safer and more effective surgeries. Software currently pending FDA approval for use in clinical settings.
- Developed a brain-to-text machine learning system to classify brain neural data into speech to aid patients with speech/neurological disorders in communication. Achieved a 20% classification accuracy across 23 English phoneme classes that match industry-leading classification models.

Software Developer Intern, Concur Hipmunk, San Francisco CA **May 2019 — Aug 2019**

- Developed Andrepanel, an internal company tool to drive the parsing and visualization of important metrics such as popular flight routes, hotel bookings placed through our mobile app, and website booking systems into an intuitive dashboard.
- Pioneered an intuitive front-end glossary system that pairs with Andre panel to allow employees, regardless of technical expertise, to acquire data in a faster and more efficient way. It converts plain text searches into SQL queries that communicate with the back-end SQL database.

RELEVANT PROJECTS

Kinetica - Converting sign language into spoken English **Aug 2018 — Present**

- Funded by a grant from Rice University's Innovation Lab, Kinetica is a wearable glove that converts American Sign Language (ASL) into spoken English so that deaf/mute individuals can communicate with any member of society without the need of a translator, thus empowering them.

Lyfeband - Neonatal Health Monitor **Jun 2016 — Jun 2018**

- Built a neonatal health monitor using Arduino and programmed the interface in python. Featured on MIT's website as one of the most promising start-ups. Has been provisionally patented and looking for partnerships.

AWARDS & HONORS

Plenary Speaker - Harvard National Collegiate Research Conference **Jan 2022**

- Selected to be a plenary speaker at Harvard's National Collegiate Research Conference. Plenary speakers are considered the most experienced undergraduate researchers and I presented my research focused on the topic of Future Integration of Robots in Society.

Outstanding Junior Award **April 2021**

- Awarded to one Junior at Rice University who demonstrated excellence in leadership, research and service to society.

Hershel M. Rice Invention Award Winner **April 2020**

- This award recognizes the best undergraduate engineering invention developed at Rice. Awarded for Kinetica.

Awarded Rice University's New Entrepreneurship Grant (Lilie Lab) - Kinetica **Aug 2018**

- Awarded to one student in Rice's freshmen class to develop a project under the guidance of the team at Liu Idea Lab for Innovation and Entrepreneurship. Grant awarded to Kinetica.

PATENTS AND PUBLICATIONS

1. **Singh, M.**, Shome, R. & Kavradi, L. Parallel RRT Algorithm for Robotic Motion Planning. *Ken Kennedy AI Conference* (2021).
2. **Singh, M.**, Shome, R. & Kavradi, L. Parallel RRT Algorithm for Robotic Motion Planning. *Gulf Coast Undergraduate Research Symposium ECE* (2021).
3. Kadipasaoglu, C., **Singh, M.** & Donos, C. Automatic Vessel Segmentation of the Brain using image filters. *In Review* (2021).