

# Sushrita Rakshit

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## EDUCATION

### University of Michigan College of Engineering

Bachelors in Computer Science and Engineering (BSE), Minor in Statistics | GPA: 3.52

Ann Arbor, MI

August 2021 - Present

- **Relevant Coursework:** Discrete Mathematics | Data Structures and Algorithms | Computational Social Sciences | Applied Linear Algebra | Intro to Statistics and Data Analysis | Web Systems | Introduction to Computer Organization | Statistical Methods II
- **Coursework In Progress:** Introduction to Machine Learning | Computer Vision | Statistical Computing
- **Activities and Societies:** UM::Autonomous Boat Team, Shei Magazine Web Team

## PROFESSIONAL EXPERIENCE

### Bringing Large-scale Analytical Breakthroughs Laboratory (Blablalab)

Ann Arbor, MI

Research Intern - Large Language Models and Spatial LLMs

August 2023-Present

- Web Scraping popular platforms like Yelp and Yellow Pages, utilizing Google Maps API to generate 55 million routes around Ann Arbor used for supervised learning model training data.
- Training flan-T5 to respond to landmark driven routing. Model aims to respond with accurate routine turns without hallucinations. Benchmarking performance via PIQA and personalized dataset to be published in XAI datasets
- Prompt and probe engineering to discern which layers of flan-T5 correspond to spatial cognizance, specifically trying to gauge which layer(s) the model can discern navigation turns. Tracking spatial loss across multiple layers as well as spatiality through global and local neighbor algorithms.
- Creating performance metrics via Jaccard Indexing to gauge model's performance in "turning" at correct locations. Thorough parsing of model outputs to filter for intersection between agreement of model performance and model output over total model outputs.

### Advanced Propulsions Concepts Laboratory

Ann Arbor, MI

Research Intern - Natural Language Processing (Summer 2023)

May 2023 - August 2023

- Developed an advanced Aerospace student chatbot leveraging historical Piazza data and cutting-edge NLP models (LlaMa, Alpaca, and Vicuna) with Langchain and ChromaDB libraries. Achieved a 30% faster information retrieval time, enhancing academic resource accessibility.
- Engineered an intelligent summarizer, condensing research papers and dissertations with impeccable referencing and citations. Resulted in a 40% increase in research productivity for Aerospace students and faculty.
- Collaborated with a cross-functional team to integrate chatbot and summarizer into educational platforms, benefiting over 1,500 Aerospace students and contributing to a 15% boost in platform engagement and adoption.

### Computational Vascular Biomechanics Laboratory

Ann Arbor, MI

Research Assistant - Research and Development

December 2022 - June, 2023

- Spearheaded left coronary artery generator using NumPy, expanding AngioNet's dataset. The generated data resulted in a 30% increase in model accuracy and robustness.
- Designed Python script with NumPy and Matplotlib to compare Real vs. Synthetic Left Coronary Trees. Deduced optimal branch rotation angles, generating physiologically accurate synthetic data for research and training.
- Utilized YOLOv5 and stenosis weights for precise stenosis localization in deidentified angiograms. This generated new data that would be used to fine-tune the deep learning model. Achieved 15% reduction in false positives during stenosis detection using cropping techniques for PatchAngioNet training.

### HotSoup Mobile App for the Homeless

Remote Startup

Full-Stack Intern

June 2022 - September 2022

- Developed modules with GoogleMaps API for real-time tracking, enhancing user experience with nearby soup kitchen recommendations. Ensured robustness through Postman testing.
- Collaborated on PostgreSQL frontend, creating dummy data for streamlined development and debugging API calls with Postman.
- Utilized Docker Desktop to co-create efficient ADT containers, reducing setup time by 25% and enhancing system scalability.
- Designed MongoDB program to store 1000+ document-centric data values for nationwide soup kitchen locations, improving data accessibility and analysis.

## PROJECTS

### NLP Text Processor and Summarizer - Python

Personal Project

- Designed and implemented a program that takes in txt files and tokenizes paragraphs to extract any repetitive and/or unnecessary linguistic information within text. Incorporated usage of libraries such as NLTK and NetworkX.
- Program can tokenize text, remove English stop words, summarize, and lemmatize text in files for easier understanding.

### Instagram Clone Mockup

Group Project

- Creation of Instagram via both server-side and client-side dynamic pages. Applied asynchronous programming concepts through ReactJS that allowed for seamless user interaction through button clicks, pagination, and infinite scroll.
- Integrations of GET/POST/PATCH/DELETE requests associated with each user and constant updates to a SQL database in the backend.

## SKILLS

- **Languages:** Python, C++, CSS, HTML, MATLAB, Jupyter Notebook, R, SQL, JavaScript
- **Technologies:** Trello, JIRA, Github, Postman, Google APIs
- **Libraries:** NetworkX, Numpy, NLTK, Pandas, Keras, pyTorch, scipy, Matplotlib, Jinja, Flask, FastAPI
- **Frameworks:** ReactJS, Hadoop