

VANSH NAGPAL

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Education

University of South Carolina - Columbia, Honors College

Spring 2025

Bachelor of Science in Computer Science, Bachelor of Science in Mathematics

GPA: 4.000, President's List (x4)

Relevant Coursework

Data Structures and
Algorithms

Software Engineering
Operating Systems

Statistics for Engineers
Artificial Intelligence

Linear Algebra
Machine Learning

Research Experience

SyReX Lab(5G Systems Research on X at USC)

Fall 2022 - Present

Undergraduate Research Assistant

Columbia, SC

- Utilize millimeter-wave(mmWave) technology to explore the applications of robust pedestrian and vehicle detection using 5G transmitted signals alongside data transmission/networking.
- Develop MATLAB/Python scripts to visualize data and extract features from mmWave signals and camera images .
- Implement a TensorFlow deep-learning-based approach for the purpose of predicting the real silhouettes with range information of vehicles/pedestrians from transmitted mmWave data.
- Awarded Magellan Scholar Research Grant of \$3000 to pursue research further.
- Published accepted poster 'Towards Robust Pedestrian Detection with Roadside Millimeter-Wave Infrastructure' to INFOCOM 2023 conference

Jefferson Lab - J/Psi Meson Event Generator

Summer 2022 - Fall 2022

Undergraduate Research Assistant

Columbia, SC

- Developed software in C++ to improve UI for a nuclear physics simulated event generator for the purpose of accurately simulating nuclear events pertaining to J/Psi Meson photoproduction.
- Worked closely with a team of researchers to determine the most effective and feasible solutions for implementing features.
- Programmed in an exclusively UNIX/LINUX server environment and wrote shell scripts for the purpose of file manipulation, data processing, and automating routine tasks.
- Presented my research progress weekly to a team of nuclear physicists at Jefferson Lab and the University of South Carolina Physics Department.

Projects Experience

Water Quality Chatbot - Artificial Intelligence Project | Python, JSON, Flask, VS Code

- Created a data-driven water quality assessment chatbot in Python that assesses the potability of water given various recorded time-series data like pH, Dissolved O2, and other water quality metrics to assess potability with 80% accuracy.
- Implementing web application with chatbot for water quality queries using Flask.
- Utilized BERT/NLTK libraries for natural language processing to allow for more natural conversation with user.
- Implemented a machine learning-based approach to return the safety confidence of drinking water as a percentage.

Learning Management System - Software Engineering Project | Java, Python, JavaScript, JSON, Scrum

- Developed a learning management system with the goal of providing educators and students a platform to learn programming languages like JavaScript and Python.
- Collaborated with a development team using Git and managed sprint progress using SCRUM methodology.
- Programmed in Java to manage JSON databases to strategically load and save necessary data after running an instance of Learning Management System (LMS).
- Tested LMS prototype using JUnit and created a High-Fidelity prototype to showcase expected functionality to client.

Wordle Replica (Nerdle) | JavaScript, HTML/CSS, Java, Server-based Web Development

- Designed a working replica of New York Times game Wordle using HTML/CSS/JavaScript.
- Programmed game to make real-time data requests to WordNik API and implemented accurate game mechanics using various data structures/algorithms.

Skills

Languages: Java, Python, C/C++, MySQL, MATLAB, R, HTML/CSS/JavaScript, Prolog/Haskell

Tech./Frameworks: AWS Cloud, Microsoft Excel, UNIX/Linux, Git, TensorFlow, .NET, React.js/Node.js, SAP ERP

Soft Skills: Leadership, Problem-Solving, Teamwork, Project Management, Communication

Leadership Experience

Minorities in Computing

Fall 2022 – Present

President

University of South Carolina

- Organize and plan events for professional development, social, and tutoring purposes for 20+ members.
- Conduct biweekly meetings with the executive board to oversee progress in the planning for the upcoming semester.
- Lead activities for outreach to local schools to encourage interest in Computer Science and Engineering.