Rohan Chandra, TS/SCI Clearance

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Education

Johns Hopkins University, Baltimore, VA   September 2023 - Present
M.S. in Robotics and Automation, Whiting School of Engineering
University of Virginia, Charlottesville, VA   August 2018 - May 2022
B.S. in Computer Engineering, School of Engineering and Applied Science   Academic GPA: 3.673
Graduated with High Distinction, Minor in Business

Experience

***Associate Software Engineer*, Northrop Grumman,** Dulles, VA   September 2022 – Present
- Design and implement mission-specific algorithms for classified satellite missions using Python and C++ in our proprietary mission-planning tool.
- Act as a bridge between us and our unclassified team, write multi-thread applications, perform DevOps tasks, such as improving the performance of our CI/CD pipeline in Jenkins, write unit tests, oversee and develop 15+ microservices in Docker containers, and work in an Agile environment using the Atlassian Suite (Confluence, Jira, and Bitbucket).

***FIRST Robotics Software Coach*, Nova Labs,** Fairfax VA   July 2022 - Present
- Led the creation and development of the software education practices of Nova Labs Robotics, ensuring that its 5 FIRST Tech Challenge (FTC) teams receive the training needed to become excellent developers and future leaders. As a result, students have since advanced to the state championships multiple times and have volunteered to help rookie teams develop their software skills.
  - Established and taught Robot-Go, an 8-week FTC software bootcamp giving students hands-on experience with robotics programming concepts and teaching them software development best practices.
  - Produced, filmed, and edited YouTube lessons of Robot-Go concepts as an additional aid to the students.
  - Instructed parents volunteers in basic software skills to enable them to assist their students.
  - Coordinated off-season competitions and extended training sessions in advanced, industry-relevant topics, such as odometry, to give teams the extra competitive advantage for the following season.

***ML/Robotics Research Assistant*, Homa Alemzadeh, University of Virginia,** Charlottesville, VA   January 2021 – May 2022
- Built an image augmentation algorithm to increase the size of our training data to train a semi-autonomous **robotic surgery** machine learning model. Integrated the algorithm into the MRCNN (Mask Recurrent-Convolutional Neural Network) and offered the ability to more than double the size of our training data via a user-specified combination of rotations, skews, and shears on the images.

***Software Development Intern*, S/W Factory, Leidos,**   Charlottesville, VA May 2021 – August 2021
- Developed reliable microservices (built with ReactJS) for the United States Air Force monitoring the status of all flights globally.
- Designed an innovative approach to update copyright headers on all Software Factory projects, avoiding tedious manual updates.
- Researched, wrote, and presented a paper on the use of Kubernetes ConfigMaps to automatically run Kubernetes Jobs.
- Regularly led scrum meetings to make sure all developers were up to date on their tasks.
- Ensured the robustness and reliability of my software by creating rigorous unit tests.

***Software Development Intern*, S/W Factory, Leidos,**   Charlottesville, VA May 2020 – August 2020
- Collected and analyzed tactical data from US land, sea, and sky troops to provide them better organizational strategy.
- Achieved 75% test coverage via a reusable Java module that abstracted use of a Redis datastore. Abstractions included Connection, Configuration, and CRUD operations. Module functioned as a black box and was well utilized within the team.
  - Used Singleton and AbstractFactory design patterns to provide a concrete implementation with the Jedis library.
- Used Bitbucket to release and distribute module to team. Integrated my Gradle builds with CI/CD pipeline on Jenkins.
- Published a paper on scaling Kubernetes pods based on incoming flight data on the Leidos Confluence account.

Projects

RAG-Powered AI Agent - GSA Federal AI Hackathon
- Achieved top 10 finalist position at GSA's Federal AI Hackathon for developing a RAG powered AI Agent as a new feature for USDA.gov
- Hackathon goal was to develop innovative ways to incorporate AI into government services to make them more useful
- Built the agent from scratch in 5 hours. RAG, NLP, LLMs, and word-embeddings provided by Cohere enabled the agent to collect numerous hard-to-read, lengthy, and scattered articles from USDA.gov into a single location. User could then send natural language queries to the agent for information in any of those articles, without needing to find, read, and understand them on their own
- Instructed the agent to generate bibliography of sources used to generate answers, increasing user trust in the agent by exposing the "black box" of the agent
- Interviewed by members of the press inquiring about our innovative solution. Article Link: https://tinyurl.com/43rv2su4

Turtlebot4 ROS Learning Platform
- Taught myself ROS, ROS2, Rviz, and Gazebo using ClearPath Robotics Turtlebot4. Implemented several industry-standard perception, planning, and control algorithms, such as SLAM.

University of Virginia HooHacks Hackathon 2022 - TrueForm
- Utilized OpenCV and Tensorflow to create a web app that, when given a video of a user performing an exercise, would overlay colored lines indicating whether's the user's form was correct or incorrect. More information on the web app can be seen here: https://devpost.com/software/true-to-form

University of Virginia HooHacks Hackathon 2021 - Virtual Fitness Trainer
- Created an augmented reality fitness app using echoAR, offering enhanced demonstrations of exercises such as squats and deadlifts. Achieved a finalist position in our category and received an invitation to participate in Microsoft Garage. More information on the web app can be seen here: https://devpost.com/software/virtual-fitness-trainer

Textbook Exchange Web Application – a Start-up effort
- Launched a student-to-student textbook exchange web application built with Django. The website features search functionality, user reviews, messaging between clients and sellers, and support for payment via PayPal or Venmo.

Arduino Guitar Tuner
- A Discrete Fourier Transform algorithm running on an Arduino Mega analyzes raw audio from a microphone and returns the note being played, informing the user whether they have tuned their guitar properly.

Relevant Coursework

***Johns Hopkins University*, Artificial Intelligence**   May 2024 – August 2024
- Wrote 13 Artificial Intelligence algorithms from scratch, covering topics including, but not limited to, Reinforcement Learning, Naive Bayes Classifiers, Decision Trees, State Space Search, and Constraint Satisfaction Problems

***University of Virginia,* F1/10 Autonomous Vehicles**   January 2021 – May 2021
- Implemented Perception, Planning, and Control algorithms using ROS in Python. Because of COVID-19, algorithms were tested on a simulated robot in Rviz. Algorithms developed included PID, Follow-the-Gap, and SLAM.

***University of Virginia,* Embedded Systems and Robotics**   September 2019 – May 2020
- Assembled and programmed a line-following robot using the TI-RSLK MAX Robot Learning Kit. Planned the control flow using a Mealy FSM and used sensor data from bump and line sensors to inform a PWM Control Loop how to run the motors. Achieved the second-fastest time in a race against my peers.

Skills & Interests
- Languages: Python, C++, Java, C, Bash, Arduino C, Hindi, Spanish
- ML Tools: RAG, NLP, LLMs, Word-Embeddings
- Tools/Frameworks: ROS, ROS2, Cohere,MATLAB, Rviz, MySQL, Multisim, Ultiboard, Django, AutoCAD Inventor Certified
- OS/Container Technology: Linux, Docker, Kubernetes, Windows, MacOS, Jenkins, Nexus
- Development Tools: Atlassian Suite, VSCode
- Interests: 3D Printing, Working Out, Volunteering, Crocheting, Video Production and Editing