Nandith Narayan
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Education

Florida Institute of Technology, Melbourne, FL   May 2022
Bachelor of Science in Computer Science GPA 3.81

Skills

Java, SQL, C, C++, Python, Numpy, Keras, Junit, Git, Software Testing, Data processing for Neural Networks, Haskell, Compiler Construction, Antlr, Assembly, NuXmv, SOAR, Emulator Development, Go, Blender, AWS.

Experience

Florida Institute of Technology, Melbourne, FL   August 2019 - Present
Undergraduate Research Assistant
- Developed an autonomous agent to copilot a simulated VTOL aircraft using the SOAR cognitive architecture.
- Co-authored a paper titled *Assuring Increasingly Autonomous Systems in Human-Machine Teams: An Urban Air Mobility Case Study* that was presented at the FMAS21(Formal Methods for Autonomous Systems) conference.
- Designed and developed an agree-guarantee based reasoner that performs reasoning on CSADL (Cyber Security Architecture Design Language)
- Worked with a team from Collins Aerospace to formally verify an autonomous copilot system written in the SOAR cognitive architecture.
- Designed, developed, and maintained a SOAR to NuXmv translator that translates an autonomous SOAR agent for formal verification using the NuXmv symbolic model checker.

Compiler Construction
- Developed a mini-java to spark compiler in java.
- Designed a JavaCC grammar for creating a parser.
- Utilized software testing techniques to test the functionality of the compiler.
- Implemented register spillage, non-local access, inheritance, recursion, and objects.

Neural Networks
- Used convolutional neural networks to perform image classification on the CIFAR-10 dataset.
- Implemented genetic algorithms to augment training data for image classification.

Competitive Programing club

Projects

Java based GameBoy emulator
- Wrote a GameBoy emulator that emulates the z80 cpu found in the original gameboy.

8-bit breadboard computer
- Built an 8-bit computer on breadboards using TTL digital logic components.

Software based raytracer
- Programmed a raytracer to render a cube inside a 3-Manifold.

Audio visualizer
- Implemented the Cooley-Tukey Fast Fourier Transform to create an audio visualizer.

3D dense neural network visualizer
- Used VPython to render a 3D visualization of the weights and activations of a fully connected deep neural network.

Autonomous neural networks based moon lander
- Trained a neural network to control and land a simulated lunar lander in Kerbal Space Program.

Simulated robotic arm controller
- Used inverse kinematics and gradient descent to control a virtual robotic arm.

Phoneme classification
- Used convolutional neural networks, spectrograms, and hierarchical classification.

Automated urban gardening monitoring system
- Used AWS and a Texas Instruments launchpad microcontroller to log temperature, humidity, and sunlight intensity as part of an IoT competition hosted by the IoT students club at the University of Florida.