

PROFESSIONAL INTERESTS

Languages: Python, C & C++, C#, Java, Lua, JavaScript, Perl

Competencies: ROS, Stable-Baselines3, PyTorch, Web Sockets, NumPy, Linux, Unity, V-Rep, Cisco Networking, 2D & 3D Physics and Simulation Engines

Research Background: Robotics & AI; Object Manipulation and Grasping, Audio Processing, Deep Reinforcement Learning, Transformers

EDUCATION

Bachelor of Science in Computer Science, Concentration in Robotics and Automation

Cumulative GPA:

University of South Florida College of Engineering, Tampa, FL

3.6/4.0

Courses Taken: Data Structures, Intro to AI, Control of Mobile Robots, Operating Systems, Computer Architecture, Calculus III

Fall 2020 - Spring 2024

EXPERIENCE

Software Engineering R&D Co/Op

May 2022 - Present

CAE USA

Tampa FL

- Development of Windows and Linux lab environments of computer system networks for simulation and hardware testing.
- Expanded GitHub and Artifactory API functionality within in-house software management tools and projects using Rest Sharp; Angular JS application development for system management automation tool, and user permissions manager.
- Development of Docker and Jenkins Unit Testing pipelines for commonly used software tools built in Visual Studio.
- Collaborated on repositories for improving SonarQube quality gate rating on dozens of source code ratings from E to A.

Undergraduate Researcher

Fall 2021 – Present

Robot Perception and Action Laboratory, *University of South Florida*, <https://rpal.cse.usf.edu/>

Tampa FL

- Research in robotic object manipulation through reinforcement learning; Collect and analyze data in the real world and simulation for training of RL models and investigate new solutions to improving model accuracy and performance.
- Document and communicate results amongst lab members and incorporate recorded findings into academic publishing.

Senior Coding Coach

Fall 2021 – Winter 2022

theCoderSchool

Tampa FL

- Formulate hobby projects based on student's interests, aid in design development, and educate on the utilization of necessary computer logic principles. Embrace the software design process to bridge ideas to reality.

Vice Chair; VEX Robotics Programming Lead

Fall 2020 - Present

USF IEEE Student Chapter

Tampa FL

- Organize and oversee Professional Development events/forums, plan our Spring/Fall Picnics and Banquets, introduce new students and act as the main POC for all USF students interested in joining IEEE's Technical Clubs and Teams.
- Oversee and Manage Internal Affairs to the Organization, provide support to Technical Chairs for Project Development

PROJECTS

Virtual Assistant

August 2021 - Present

<https://github.com/Johnnykoch02/VirtualAssistant>

(Video from the Data Pipeline) <https://www.screencast.com/t/6TbGzbHzr>

- Develop a python Agent to target novice actions performed on a Computer User and allow verbal automation of watching Netflix shows and movies, watching YouTube videos, and playing songs on Spotify.
- Research into Keyword Model Architectures and development via Convolutional Neural Networks and LSTMs.
- Development of a system that memorizes information about different users and converses based on previous experiences, implemented using OpenAI's text-davinci3 API.

HackaBull Entry: Robbie The Danci-Bull Robot

March 2023

<https://devpost.com/software/robbie-the-dancibull-robot>

(Video) <https://youtu.be/zSz2d7ekwHU>

- Our Mission was to develop a Simulated Robot that can dance to any song you provide as input using Deep RL
- Constructed a Policy and Features Extraction Network that receives Audio data and Joint Angles as observations that outputs a probability distribution corresponding to a Dθ in each of the seventeen joints on the Robot
- Engineered a Data Pipeline that used Just Dance Videos and a Joint-Angle Extraction algorithm for Offline Reinforcement Learning and then perfect the robot's motions through Human-Driven Reinforcement Learning.

TerriBull Robotics Vex Library (Program Team Lead)

August 2021 – Present

<https://github.com/Johnnykoch02/BullBot>

(Competition Video) <https://www.instagram.com/reel/CdJ00oyvc0V/>

- Software Library written for TerriBull Robotics Team for full autonomous capability and task implementation.
- *Jetson*: Designed to track object positions and communicate object data being processed from the camera.
- *V5*: Controller of most sensors and task implementation; performs actions and relies on Jetson to minimize error.