Alec Portelli

SECURITY CLEARANCE: US GOVERNMENT SECRET

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The MITRE Corporation

Software Engineer II - April 2023 - Present
Software Engineer I - July 2021 - April 2023

Projects At MITRE

ASPEN: Robot Systems Engineer - August 2022 - Present

Lead engineer building a simulation testbed to train a UUV with reinforcement learning using NVIDIA's Isaac Sim. Wrote a high fidelity UUV physics model in Python and performed unit tests. Working with AI engineers to develop control and navigation algorithms by connecting LiDAR and fathometer sensors to ROS 2's Octomap for sophisticated mapping. Currently designing and building a UUV autonomy challenge environment in collaboration with NVIDIA and Microsoft Azure to host a government sponsored robotics competition.

Led training workshops to help teammates get up to speed with NVIDIA Isaac Sim. Presented multiple demos to NVIDIA and Microsoft executives, Navy personnel, and MITRE chief engineers. Secured a year of project funding due to the positive feedback from executives.

AI-SAFARI: Machine Learning Engineer - January 2023 - Present

Researching adversarial ML by designing and building a digital robot testbed. Lead development and rebuilt OpenAI Gym's moon lander scenario in Isaac Sim. Upgraded the fidelity of the original physics model from 2D to 3D. Helping write reinforcement learning scripts by using Isaac Sim's Physics API and PyTorch and successfully trained a Falcon9 model to navigate with a camera feed. Designed architecture and wrote code to support parallel training environments for optimized and large scale reinforcement learning.

Trailblazer: Simulation Engineer - January 2023 - Present

Lead developer building a scenario designer using Unity to help engineers simulate electronic warfare environments. Designed software architecture and developed a terrain engine using DTED2 data. Implemented custom kinematics models for vehicles and wrote code for simulating antenna and RF physics. Wrote unit tests and benchmarks to ensure physics calculations were correct. Time needed to build and simulate scenarios decreased by over 300%, increasing productivity and accuracy. Delivered over 10 demos to multiple chief engineers.

Falcon: Visualization Engineer - October 2022 - Present

Lead developer designing and building a Unity based visualization application to help analyze 5G aviation scenarios. Wrote a simple plane physics model to accelerate hardware-in-the-loop testing.

Led a team of three engineers and developed and deployed the software to over 20 users. Delivered regular demos to project leads and RF department engineers.

Engineering Skills

Software Architecture, Robot Simulation, Machine Learning, 3-D Modeling/Printing, Simulation & Modeling, Full Stack Engineering, Rapid Prototyping, UX/UI Design, Project Management, UI Development

Certifications

AWS Cloud Practitioner

Tools

Unity Engine, AWS, MATLAB, Autodesk Suite, PyTorch, TensorFlow, Git, ROS2, Isaac Sim, Gazebo, PyBullet, Arduino, CoppeliaSim

Programming Languages

C#, Python, JavaScript, Java, SQLite, HTML, CSS, C++,

Education

Johns Hopkins University
Masters: Robotics Engineering

Concentration in autonomous systems, ML, and simulation

Tufts University
Bachelors: Engineering

Double major in human-computer interaction and biomedical engineering sciences.