Elton Lemos

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SUMMARY

Innovative and driven robotics engineer with a strong foundation in **robotics and AI product development**, specializing in designing and deploying **cutting-edge automation and robotic systems**. Proficient in **robotics frameworks** such as **ROS and Docker / Kubernates**, with expertise in **REST API** development and **machine learning technologies** like **TensorFlow, PyTorch, and reinforcement learning**. Experienced in integrating **robot perception, motion planning, and control systems** to develop scalable and efficient robotic solutions.

SKILLS

Programming Languages: Python, C++, Java, Bash.
Frameworks/OS: ROS, Linux, Django, Windows, Docker, Kubernetes.
SLAM: FAST-LIO, LIO-SAM, GT-SAM, Cylinder3D, MMDetection3D.

Planning and Control: Nav2, Moveit.
ML/AI: Tensorflow, Pytorch, LLM, Transformers, Q-learning, Recommendation algorithms, XG-BOOST.
Simulators: Gazebo, Unity, Issac-Sim.
Cloud: AWS, Azure.

WORK EXPERIENCE

Research Assistant - University at Buffalo, DRONES LAB - MOOG, Buffalo.   Jan 2024 - Present

- Led the R&D of SLAM, Planning, and Diagnostics modules for the Excavator Automation project, secured with a $750,000 funding from MOOG.
- Designed a Field of View optimization algorithm based on COLMAP, to improve camera feature registrations using motion decoupled sensors resulting in a 10.91% increase in feature detection scores.
- Designed a PointNet based neural network model for LiDAR segmentation delivering an accuracy of 91% and IoU of 0.51 enabling real time Field of View optimization at 2 fps on Nvidia Jetson.
- Led the benchmarking and implementation of IMU, LIDAR and GPS fusion AI/ML libraries in C++ and Python.
- Eliminated the need for cross-compilation of FAST-LIO localization ROS2 ML library through Dockerization, thus ensuring reusability and seamless deployment on simulators and development boards.
- Developed an optimized ROS2 Diagnostic node in Python that enhanced team-wide debugging capabilities, resulting in reduced debugging effort and a 60% increase in productivity.

Product Engineer - LTIMindtree, Automation and Centre of Excellence, Mumbai   May 2022 – Jul 2023

- Led a four-member team in the development of a flagship business analytics tool; Canvas Insights, which automated the ticket analysis process, delivering actionable insights and generating custom dashboards for 150 CXOs across 50 accounts.
- Designed and developed a RASA based NLU query engine named 'Ask Tiki' for the Canvas Insights tool, which became one of the three core features of the tool, contributing to 70% of customer acquisition.
- Developed plugins which enable Canvas Insights tool to receive millions of data entries from various ITSM sources like Excel sheets and ServiceNow MID servers, increasing its usability.
- Designed a On-Demand, time sharing, containerized Machine Learning server for the tool, saving the team $17,000 annually.
- Developed a seasonality detection and trend prediction model for time series data in ITSM tickets which resulted in discovery of 17 new actionable insights that were added to the tool.
- Enhanced application performance through Dockerization, PostgreSQL database optimization and seamless Django API - Vue.js integration, achieving a 200% reduction in response time and a 55% increase in user interaction.
- Coordinated with clients and on-boarded teams to develop automation workflows that reduced client-side tool deployment time by 66% (from 3 months to mere 2 weeks).

EDUCATION

University at Buffalo, Master's of Science in Robotics - **GPA: 3.7/4.0**.   Aug 2023 - Dec 2024
University of Mumbai, Bachelor's of Engineering in Computer Engineering - **GPA: 7.45/10**.   May 2016 - Oct 2020

PROJECTS and RESEARCH

AI Pet Robot - Project (Python, Linux, Machine Learning, Computer Vision)

- An autonomous pet robot built on arduino uno(C++) and Raspberry Pi 4(Python) that can recognize, track, follow and interact with users.
- Awarded **Best Project** at XIE Bachelor's Project Exhibition, Mumbai.
- Hardware Architecture and Implementation of an AI Pet Robot - Published in IJASST.
- **Project Demo:** Youtube link

On-Manifold FOV Optimization - Research (ROS, Python, Computer Vision)
- Designed and executed robotic path planning experiments to validate and prove thesis on FOV optimization using LiDAR.
- Orchestrated the integration of code with LiDAR, realsense camera, gimbal and Boston Dynamics's Spot (quadruped) Robot.

Improving LiDAR Segmentation Algorithm by introducing Attention - Project (ROS, Python, Computer Vision)
- Designed a LiDAR segmentation pipeline that embedded GroupFree3D transformer into Cylinder3D's algorithm, resulting in an improvement of accuracy by 3%.

Autonomous F1/10th Car - Project (ROS, Python, Linux, Planning, SLAM, Unity, Gazeebo)
- Leveraged SLAM, Planning, and P.I.D. control stacks to race an autonomous F1 car, similar to AWS DeepRacer.
- Secured 1st place position at the class race among 60 participants.
- Experimented with a Q-learning controller that competed with winning lap times.

No-Code Image Classification Playground (Machine Learning, Computer Vision, Python, Flask)   **Github Link**
- Developed a no-code image classification platform during a hackathon, enabling users to customize machine learning pipelines and parameters for training and testing models without requiring Python expertise.
- Designed a dynamic and self-correcting pipeline for creation of custom CNN and ANN as well as integration with existing scikit-learn image classification and clustering libraries.
- The team's unique take on the problem statement resulted in achieving 10th place among 72 participating teams.