Victor Aladele

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EDUCATION

Georgia Institute of Technology — ***Atlanta GA***
PhD in Electrical Engineering — *Aug 2016 - Present*
Anticipated Graduation — *Aug 2022*
Research focus — *Robotics and Machine Learning*

New Jersey Institute of Technology — ***Newark NJ***
B.S. in Electrical Engineering — *May 2016*
Minor in Applied Mathematics
Overall GPA: 3.76 (Magna Cum Laude)

PUBLICATIONS

- **V. Aladele**, A. Longhini, A. Riechlin, H.Yin, C. Pek, D. Kragic, **Compensating for Errors in Cooperative Manipulation: A Decentralized Approach via Residual Reinforcement Learning**, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022 under review.
- **V. Aladele** and S. Hutchinson, **Impedance-Based Collision Reaction Strategy via Internal Stress Loading in Cooperative Manipulation**, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.
- **V. Aladele** and S. Hutchinson, **Collision reaction through internal stress loading in cooperative manipulation**, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.
- Zafar, M., Mehmood, A., Khan, M., Zhang, S., Murtaza, M., **Aladele, V.**, Theodorou, E.A., Hutchinson, S. and Boots, B., 2018, November. **Semi-parametric Approaches to Learning in Model-Based Hierarchical Control of Complex Systems**. In International Symposium on Experimental Robotics (pp. 387-397). Springer, Cham.

TECHNICAL SKILLS

Programming Languages — C++, Python
Tools — Robot Operating System (ROS), Pytorch, Pybullet, Tensorflow
OpenAI gym, MATLAB, Gazebo, Blender, CUDA, Autodesk Inventor

WORK EXPERIENCE

Georgia Institute of Technology — ***Atlanta GA***
Graduate Research Assistant — Aug 2016 - Present

· PhD Advisor: *Seth Hutchinson, PhD*
· Dissertation Title: *Cooperative manipulation strategies for multi-robot and human-robot collaboration*

Royal Institute of Technology (KTH) — ***Stockholm, Sweden***
Visiting PhD Student — Aug 2021 - Jan 2022

· Host Advisor: *Danica Kragic Jensfelt, PhD*
· Designed a novel application of residual reinforcement learning to cooperative manipulation. Tools used include: Pybullet, Stable-baselines, OpenAI gym

Google (Brain/Research) ***Remote / Mountain View CA***
Research Intern May 2021 - August 2021

· Worked on developing reinforcement learning solutions for high-speed robotics.
· Developed and implemented curriculum learning algorithms to improve robot learning.

Blue River Technology (A John Deere Subsidiary) ***Remote / Sunnyvale CA***
Software Engineering Intern May 2020 - Aug 2020

· Worked on a team to develop software for cutting-edge *John Deere* machinery
· Tools and frameworks used include: C++17, CUDA, Flatbuffers, Protocol buffers, Google Test, Jira.

Bosch (Advanced Corporate Research), BSH Home Appliances ***Sunnyvale CA***
Robotics Software Intern May 2019 - Aug 2019

· Worked on implementing impedance control on a 6 DOF robotic arm for object insertion tasks.
· Tools used include: C++, Python, ROS, Rigidbody Dynamics Library (RBDL), Gazebo, Kinova arm.

Massachusetts Institute of Technology ***Cambridge MA***
Research Intern June 2015 - Aug 2015

· **Advisors**: Daniela Rus *PhD*, Robert McCurdy, *PhD* **CSAIL**
· Designed and 3D printed gear pumps for hydraulically actuated robots.
· Designed CAD models in Autodesk Inventor.

RESEARCH PROJECTS

Cooperative Mobile Manipulation *August 2019 - Present*
Working both in simulation and on hardware

· Developing deep reinforcement learning schemes for multi-robot collaboration.
· Using TrajOpt for motion planning on a single-arm pick-and-place task.
· Applying adaptive control for dual-arm disturbance rejection.
· Implementing operational space control on KUKA IIWA7 arms that are mounted on mobile bases.
· Applying Gaussian Processes as a semi-parametric control approach for a 7DOF manipulator.
· Working in Gazebo, Drake and Pybullet.

CLASS PROJECTS

Robot Intelligence and Planning *Fall 2020*

· Implemented a version of DeepMind's AlphaZero chess AI. Used Deep Reinforcement Learning in conjunction with Monte-Carlo Tree Search to train a deep neural network to play the game of chess. Tools used include: Python, Pytorch, cuda.
· Implemented deep reinforcement learning algorithms like: DQN, REINFORCE and A2C.
· Implemented Rapidly-exploring Random Trees (RRT) to navigate a 2D map. Algorithm implementation included steering dynamics with nonlinear optimization and obstacle detection.

Computer Vision *Fall 2020*

· Image classification using deep learning framework; transfer learning with CNNs like Alexnet.
· Feature Matching, using feature detectors (Harris detector) and feature descriptors (SIFT) in pytorch.
· Object detection with limited training data; applied transfer learning.

Advanced Programming Techniques *Fall 2019*

· Used OpenGL to simulate a bitmapped football field with multiple drones controlled by a distributed MPI program. The goal was to create a simulation of multiple drones display over a football field.
· Designed a UDP server-client program.

Introduction to Robotics Research *Fall 2017*

· Target following and tracking using LIDAR, a camera and a PID controller on a turtlebot.
· Obstacle avoidance using LIDAR and odometry. One of the tasks in this section was to drive the robot to a target location using signs for direction along the way. This required using image processing and classification techniques such as the hough circles and K Nearest Neighbors classifier.
· Used Simultaneous Localization and Mapping (SLAM) with ROS navstack for obstacle avoidance.
· Worked with ROS, python, OpenCV and Gazebo simulator on Linux platforms.

RELEVANT COURSES

Computer Vision	Machine Learning	Stochastic Systems	Robot Intelligence and Planning
Linear Systems	Nonlinear Systems	Optimal Control	Interactive Robot Learning
Advanced Programming Techniques (CUDA, OpenMP, OpenGL, Sockets)			Mobile Manipulation

TEACHING POSITIONS

Graduate Teaching Assistant *August 2016 - May 2018*
Georgia Tech *Atlanta GA*

· Signals and Systems, Junior year course (3 semesters)
· Senior Design Project, Senior year course (2 semesters)

HONORS, AWARDS AND SOCIETIES

· Tau Beta Pi Honors Society, Member *August 2014 - Present*
· Institute of Electrical and Electronic Engineering, Member *August 2013 - Present*
· Selected to participate in an IDEO design-a-thon at the IEEE EMBS Special Topic Conference on Healthcare Innovation and Point-of-Care Technologies *Oct 2014, Seattle WA*

EXTRACURRICULAR ACTIVITIES

Volunteer Application Reviewer *2018 - present*

· Annually review applications for the undergraduate summer research program at MIT.

Conference Publication Reviewer *April 2020 - Present*

· Reviewed papers for publication at the following conferences: IROS(2020, 2021), ICRA(2021).

Conference Session Co-Chair *September 2021*

· Co-chaired the "Multi-Robot Systems I" session at the IROS 2021 conference.
· Reviewed papers for publication at the following conferences: IROS(2020, 2021), ICRA(2021).

Volunteer High-school Curriculum Contributor *March 2021*

· Worked with Atlanta Public School teachers to develop a project-based learning (PBL) component of the Algebra II curriculum.