

Victor Aladele

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EDUCATION

Georgia Institute of Technology

PhD in Electrical Engineering

Anticipated Graduation

Research focus

Atlanta GA

Aug 2016 - Present

Aug 2022

Robotics and Machine Learning

New Jersey Institute of Technology

B.S. in Electrical Engineering

Minor in Applied Mathematics

Overall GPA: 3.76 (Magna Cum Laude)

Newark NJ

May 2016

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

Graduate Research Assistant

Atlanta GA

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)

Visiting PhD Student

Stockholm, Sweden

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)*Research Intern**Remote / Mountain View CA**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)*Software Engineering Intern**Remote / Sunnyvale CA**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*Robotics Software Intern**Sunnyvale CA**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*Research Intern**Cambridge MA**June 2015 - Aug 2015*

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

CSAIL

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

- Developing deep reinforcement learning schemes for multi-robot collaboration.
- Using TrajOpt for motion planning on a single-arm pick-and-place task
- 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.

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 *Oct 2014, Seattle WA*
Special Topic Conference on Healthcare Innovation and Point-of-Care Technologies

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.