

# Victor Aladele

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## EDUCATION

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### 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

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- **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.

## WORK EXPERIENCE

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### 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*
- Research focus: Compensating for model errors in cooperative manipulation: A Decentralized Approach.
- Worked in Pybullet, using "Stable-Baselines" to train reinforcement learning agents to learn to compensate for model errors.

### 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.
- Implemented and trained different policy action spaces to improve performance of our robot.
- Writing unittests.

**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
- Worked in an agile-based development environment (Jira)
- Unittesting with google testing framework
- Worked with data serializing and deserializing frameworks such as: *Flatbuffers*, *Protocol buffers*
- GPU programming, *CUDA*
- Worked heavily with C++, including modern C++.
- Used Git with integrated testing (Jenkins) for version control

**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.
- Worked with different C++ libraries such as, RigidBody Dynamics Library (RBDL).
- Wrote action-client ROS nodes for switching controllers. For example, switching from a trajectory controller to an impedance controller.
- Worked with C++, version control (Git), Python and ROS.
- Worked with both simulation and hardware.

**Massachusetts Institute of Technology***Research Intern***Cambridge MA**

June 2015 - Aug 2015

- **Advisors:** Daniela Rus *PhD*, Robert McCurdy, *PhD* **CSAIL**
- Designed and 3D printed gear pumps for hydraulically actuated robots.
- Worked with Autodesk Inventor to design CAD models that were converted to STL files for printing.

**TECHNICAL STRENGTHS**

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**Computer Languages**

C++, Python

**Scripting Languages**

HTML, XML, MATLAB

**Tools**

Robot Operating System (ROS), Pytorch, Git, Autodesk Inventor, Pybullet, OpenAI gym, Gazebo, Blender, Jupyter-notebook, CUDA

**RELEVANT COURSES**

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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

**RESEARCH PROJECTS**

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

- Developing deep reinforcement learning schemes for multi-robot systems to cooperatively transport objects.
- Implementing operational space control on KUKA IIWA7 arms that are mounted on mobile bases.
- Implementing a vehicle-arm coordination scheme to enable the mobile base move in proper symphony with the arm.
- Working with RigidBody Dynamics Library (RBDL) and DRAKE in C++, version control (Git), Python and ROS.
- Working with the following simulators: Gazebo, Drake and Pybullet (interfaced with OpenAI gym).

## CLASS PROJECTS

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### 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 find a path between start and goal point on a 2D map. Algorithm implementation included steering dynamics with nonlinear optimization and obstacle detection. Code was written in Python.

### Computer Vision

*Fall 2020*

- Image classification using deep learning frameworks such as: CNNs, transfer learning with Alexnet and pytorch.
- Feature Matching, using feature detectors (Harris detector) and feature descriptors (SIFT) in pytorch.

### Advanced Programming Techniques

*Fall 2019*

- Used OpenGL to design a bitmapped football field with multiple drones controlled by different MPI processes. The goal was to create a simulation of multiple drones display over a football field.
- Developed a distributed MPI program to guide simulated spaceships safely back to dock with the mothership (also simulated). Each spaceship was controlled by a different process, while the mothership was controlled by the master process.
- Designed a UDP server-client program.
- Optimized code for solving 'Largest Product in a Grid' by creating an OpenMP multithreaded program.

## TEACHING POSITIONS

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### 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

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- Tau Beta Pi Honors Society, Member
- Institute of Electrical and Electronic Engineering, Member

*Aug 2014 - Present*

*Aug 2013 - Present*

## EXTRACURRICULAR ACTIVITIES

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### 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.

### Volunteer Application reviewer

*2018 - present*

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