

Iretiayo Akinola

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RESEARCH INTERESTS

Closed-Loop/Reactive Robot Manipulation. 3D Vision-Representation Learning for Robotic Manipulation.

Long-horizon Manipulation Planning. Next-Generation Sim-2-Real Methods for Robot Learning.

Robot Learning from Human Feedback/Demonstration. Human Robot Interaction using Novel Interfaces.

EDUCATION

- **Columbia University** New York, NY
 - *PhD. Computer Science* *Jan. 2016 – Mar 2021*
 - *Thesis: **Improving Robotic Manipulation via Reachability, Tactile and Spatial Awareness**, advised by Prof. Peter Allen*
- **Stanford University** Palo Alto, CA
 - *MS. Electrical Engineering* *Aug. 2013 – Jun. 2015*
- **Obafemi Awolowo University** Ile-Ife, Nigeria
 - *BSc. Electronic & Electrical Engineering* *Nov. 2005 – Jan. 2011*
 - *Summa Cum Laude (5 individual awards at Convocation Ceremony).*

RESEARCH EXPERIENCE

- **Google Brain Robotics** New York, US
 - *Student Researcher* *March 2020 – Aug 2020*
 - Neural Architecture Search for Learning-Based Robotic Manipulation. (**Python, Tensorflow, Gin**)
 - Developed methods to automatically find high-performing neural networks for learning manipulation tasks.
- **Google Brain Robotics** New York, US
 - *Research Intern* *May 2019 – Aug 2019*
 - Worked on Multi-view Task Learning via Deep Reinforcement Learning. (**Python, Tensorflow, Gin**)
 - Implemented different architectures for combining views from multiple cameras for robotic precision tasks.
- **Autodesk Applied Research Lab** San Francisco, US
 - *Research Intern* *May 2016 – Aug 2016*
 - Worked on Autonomous Robotic Fabrication- using computer vision and robot control to build structures from component parts. (**C Sharp, OpenCV, AutoDesk Dynamo**)
 - Implemented visual programming environment for designers to input structural designs into robot fabrication system.
- **IBM Research** Almaden, US
 - *Research Intern* *Jun 2014 – Sep 2014*
 - Worked on Image Analytics- using image processing and machine learning techniques to extract information from images. (**Python, OpenCV**)
 - Devised a means for validating the correctness of image feature detectors developed by the Watson group.
- **Stanford University Research** Palo Alto, US
 - *Research Assistant* *Feb 2014 – Jan 2015*
 - Analysis and Compression of L3 Filters for Image Processing Pipeline for Cameras
 - Developed an optimized image processing pipeline for illuminant correction using the novel L3 camera filter structure. (**MATLAB**)
- **WesternGeco, Schlumberger** London, UK
 - *Trainee Seismic Acquisition Engineer* *Jan 2013 – Aug 2013*
 - Worked with the Q-Seabed fleet on sub-surface imaging of existing or prospective oil-reserves.
 - Involved in all the stages of the Q-Seabed operations and worked with all departments.
 - Completed a comprehensive training on an Overview of Oil & Gas Industry

PUBLICATIONS

- **I. Akinola***, J. Xu*, S. Song, P. Allen. Dynamic Grasping with Reachability and Motion Awareness. Ongoing Work
- **I. Akinola***, Zizhao Wang*, P. Allen. CLAMGen: Closed-Loop Arm Motion Generation via Multi-view Vision-Based RL, Ongoing Work.
- **I. Akinola**, Anelia Angelova, Yao Lu, Yevgen Chebotar, Dmitry Kalashnikov, Jacob Varley, Julian Ibarz, Michael S. Ryoo. Visionary: Vision Architecture Discovery for Robot Learning, International Conference on Robotics and Automation (ICRA 2021).
- Zizhao Wang*, Junyao Shi*, **I. Akinola***, P. Allen. Maximizing BCI Human Feedback using Active Learning, IEEE International Conference on Robots and Systems (IROS 2020). Accepted
- **I. Akinola**, J. Varley, D. Kalashnikov. Learning Precise 3D Manipulation from Multiple Uncalibrated Cameras, International Conference on Robotics and Automation (ICRA 2020).
- **I. Akinola***, Zizhao Wang*, Junyao Shi, Xiaomin He, Pawan Lapborisuth, Jingxi Xu, David Watkins-Valls, Paul Sajda, P. Allen. Accelerated Robot Learning via Human Brain Signals, International Conference on Robotics and Automation (ICRA 2020).
- B. Wu, **I. Akinola**, A. Gupta, F. Xu, J. Varley, D. Watkins-Valls, P. Allen. Generative Attention Learning: A “GenerAL” Framework for High-Performance Multi-Fingered Grasping in Clutter, Journal of Autonomous Robots (AURO 2020).
- B. Wu, **I. Akinola**, J. Varley, P. Allen. MAT - Multi-Fingered Adaptive Tactile Grasping via Deep Reinforcement Learning, Conference on Robot Learning (CoRL 2019).
- B. Wu, **I. Akinola**, P. Allen. Pixel-Attentive Policy Gradient for Multi-Fingered Grasping in Cluttered Scenes, IEEE International Conference on Robots and Systems (IROS 2019).
- **I. Akinola**, P. Allen. End-to-End Learning-Based Hierarchical Path Planning, *In Learning Representations for Planning and Control Workshop*, IEEE International Conference on Robots and Systems (IROS 2019).
- **I. Akinola**, J. Varley, B. Chen, P. Allen. Workspace Aware Online Grasp Planning, IEEE International Conference on Robots and Systems (IROS 2018).
- **I. Akinola**, B. Chen, J. Koss, A. Patankar, J. Varley, P. Allen. Task Level Hierarchical System for BCI-enabled Shared Autonomy, IEEE-RAS International Conference on Humanoid Robots (ICHR 2017).
- F. Germain, **I. Akinola**, Q. Tian, S. Linsel, B. Wandell. Efficient illuminant correction in the local, linear, learned (L3) method. Proc. SPIE 9404, Digital Photography XI, 940404 (2015)

TEACHING EXPERIENCE

- **Humanoid Robots (COMS 6731)**
Guest Lectures: Reinforcement Learning in Robotics *Spring 2018, Spring 2019*
- **Computational Aspects of Robotics (COMS W4733)**
Guest Lectures: Shared Autonomy, Reinforcement Learning *Fall 2017, Fall 2018*
- **Humanoid Robots (COMS 6731)**
Teaching Assistant (Columbia University) *Jan 2017 – May 2017*
- **Computational Aspects of Robotics (COMS W4733)**
Teaching Assistant (Columbia University) *Aug 2016 – Dec 2016*

OTHER PROJECTS

- BCI Controlled Robotics *Aug 2016 –*
- Built a system that gets brain signals from humans and processes it into action commands for robots
 - Develop on the PR2 robot to take inputs from the BCI system and actuate on the tasks. (**ROS, C++, Python, MATLAB**)
- Grasp Quality Evaluation *Feb 2016 –*

- Investigated the use of 3D convolutional neural networks to efficiently calculate quality (energy) during grasp planning. (**ROS, C++, Python**)

Co-Segmentation for Foreground extraction

Feb 2016 – March 2016

- Implemented segmentation using bounding box prior for foreground/background separation.
- Used co-segmentation to eliminate the need for bounding box and achieve automatic foreground extraction on groups of images with similar content. (**MATLAB**)

Food Delivery Robot (Stanford Robotics Club)

Feb 2015 – Jun 2015

- Investigated the use of 3D convolutional neural networks to efficiently calculate quality (energy) during grasp planning. (**ROS, C++, Python**)

Stereolithography Process Modelling for 3D Printing

Oct 2014 – Dec 2014

- Derived an approximate model for the stereolithography process as a set-up for solving the inverse problem of the process. (**MATLAB, Python**)

Gesturing in Virtual 3D space (Class Project)

02/2014 – 04/2014

- Explored interacting with the light-field 3D display system by using hand gestures to manipulate objects in displayed 3D image that is viewed without glasses. (Leap Motion device connected with the Holografika display)

VOLUNTEER ACTIVITIES

Fundamentals of Artificial Intelligence Workshop, Ile-Ife, Nigeria.

Jan 2020

- organized Fundamentals of AI Workshop for Secondary School Students in Ile-Ife, Nigeria.

Robotics Lab Tour for Harlem Children's Zone STEM Exposure, 2019.

Nov 2019

- organized a Lab Tour and Research Presentations to High School Students visiting Columbia University Robotics Lab.

Student organizer for Faculty Colloquiums and PhD Candidate talks in the CS Department.

Jan 2019 –

- publicized Faculty Colloquiums and PhD Candidate talks.
- organized student sessions where students of the department interact with Colloquiums speakers and Faculty Candidates.

AWARDS

Young Researcher Fellowship to the annual Heidelberg Laureate Forum.

May 2020

Michelman Award to a PhD student for exemplary service to the Computer Science department.

May 2020

Princeton Pathway into the Academy Program at Princeton University.

Oct 2019

Microsoft Research PhD Fellowship

Jan 2018

Presidential Special Scholarship for Innovation and Development, Nigeria

Aug 2013

Reward Nigeria Awards (Academic Achievement for top Graduating students in the top schools)

Dec 2011

REVIEW ACTIVITIES

IROS 2018, ICRA 2019, RSS 2019, IROS 2019, CoRL 2019, ICRA 2020, CASE 2020, IROS 2020, ICRA 2021, CASE 2021, IROS 2021