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John D. Kanu

Research Interests

Artificial intelligence, robotics, machine learning, robotic learning, planning

Education

2018–Present **PhD in Computer Science**, *University of Maryland*, College Park.
Advisor: William C. Regli, Co-advisor: Yiannis Aloimonos

2014–2018 **BS in Computer Science**, *University of Maryland*, College Park.

2014–2018 **BS in Mathematics**, *University of Maryland*, College Park.

Conference Publications

2019 Regression and Classification for Direction-of-Arrival Estimation with Convolutional Recurrent Neural Networks
Zhenyu Tang, **John Kanu**, Kevin Hogan, Dinesh Manocha. Interspeech 2019.

Papers in Preparation

2020 Following Instructions by Imagining and Reaching Visual Goals
John Kanu, Eadom Dessalene, Xiaomin Lin, John Aloimonos. IJCAI 2020.

2020 Robot-Agnostic Action Representations
John Kanu, Jacob Bunker, William Regli. IROS 2020.

Presentations

2019 Regression and Classification for Direction-of-Arrival Estimation with Convolutional Recurrent Neural Networks
Zhenyu Tang, John Kanu, Kevin Hogan, Dinesh Manocha. Interspeech 2019.

Research Experience

May 2019–present **Graduate Research Assistant**, *Institute for Systems Research (UMD)*.
Developing physics-based, robot-agnostic action representations for generating executable code from high-level robot actions, integrated within a functional interoperable compiler.

Apr 2019–present **PhD Student Researcher**, *Perception and Robotics Group (UMD)*.
Developed a novel architecture for training agents to follow instructions by imagining and reaching visual goals. Running experiments on a real-world Sawyer robot.

Oct 2018–Mar 2019 **PhD Student Researcher**, *Geometric Algorithms for Modeling, Motion, and Animation (UMD)*.
Developed a novel learning-based approach to estimate the direction of arrival (DOA) of sound sources using convolutional recurrent neural networks
- New formulations yielded an improvement in accuracy over two other models on the LOCATA and SOFA benchmarks
- Developed a method to generate synthetic data to train deep neural networks using state-of-the-art sound propagation algorithms

Aug 2017–Dec 2017 **Undergraduate Research Assistant**, *University of Maryland*.
Implemented handwriting recognition and arm control capabilities for the Baxter robot within the ROS framework

Jun 2014–Aug 2014 **Student Volunteer**, *US Naval Research Laboratory (NRL)*, Washington, DC.
Analyzed unmanned aerial vehicle (UAV) flight data to optimize flight control systems.
- Worked with a team of US NRL researchers and developed a data analysis pipeline employing statistical and machine learning methods

Computer Skills

Programming Languages	Python, C++, C, Matlab, Prolog, OCaml, Ruby, Java
AI and ML	TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, Robot Operating System (ROS), MuJoCo
OS	Linux, Ubuntu, Windows
Writing	LaTeX

Teaching

Spring 2019 **Introduction to Machine Learning (CMSC 422)**, *University of Maryland*.
Instructor: Professor James Reggia

Fall 2018 **Introduction to Machine Learning (CMSC 422)**, *University of Maryland*.
Instructor: Professor William Regli

Spring 2018 **Introduction to Artificial Intelligence (CMSC 421)**, *University of Maryland*.
Instructor: Professor James Reggia

Fall 2017 **Introduction to Machine Learning (CMSC 422)**, *University of Maryland*.
Instructor: Professor James Reggia

Spring 2017 **Introduction to Artificial Intelligence (CMSC 421)**, *University of Maryland*.
Instructor: Professor Don Perlis

Fall 2016 **Introduction to Machine Learning (CMSC 422)**, *University of Maryland*.
Instructor: Professor VS Subrahmanian

Honors and Awards

2016–Present **Upsilon Pi Epsilon International Honor Society**.

2017–2018 **David E. Eisner Scholarship**.

2016–2017 **John D. Gannon Scholarship**.

2015–2018 **Computer Science Departmental Honors**.