**Aaron T. Wang**

Phone: +1 (801) 347-9374 | E-Mail: [aaron.wang@duke.edu](mailto:aaron.wang@duke.edu) | [LinkedIn](https://www.linkedin.com/in/aaron-wang-453a90228/) | [GitHub](https://github.com/aaWang27)

**EDUCATION**

**Duke University,** Durham, NC **Expected May 2027**

B.S.E in Electrical and Computer Engineering, Double Major in Computer Science

*Coursework:*Multivariable Calculus, Data Structures and Algorithms, Molecular Biology, Engineering Design and Communication

**University of Utah,** Salt Lake City, UT,4.0 GPA **Aug. 2022 – May 2023**

*Coursework:*Multivariable Calculus, Linear Algebra, Introduction to Differential Equations, Introduction to Algorithms and Data Structures

**Skyline High School,** Salt Lake City, UT,*IB Diploma*, 3.98 GPA **Aug. 2019 – June 2023**  
*Awards and Honors:* U.S. Presidential Scholar, Utah [General Sterling Scholar](https://www.deseret.com/utah/2023/3/22/23644135/2023-sterling-scholar-winners-announced-scholarships), 6th Place Team at the November 2021 Harvard-MIT Math Tournament, 3rd Place Team in Division B at the 2022 American Regions Mathematics League National Competition, USA Computing Olympiad - Silver Division

**Independent Study**

CS 109 Introduction to Probability for Computer Scientists, by Stanford University, published online Summer 2023

CS 11-785 Introduction to Deep Learning, by Carnegie Mellon University, published online Summer 2022

6.036 Introduction to Machine Learning, by MIT OpenCourseware Spring 2022

**SKILLS**

**Programming Languages:** Python, Java, MATLAB, C++, C#, C, Arduino, HTML, CSS, JavaScript. Highly experienced in Python and MATLAB for machine learning.

**Tools:** TensorFlow, Keras, PyTorch, NumPy, Pandas, OpenCV, PyQt, Git, SolidWorks, Fusion360, Docker, Microsoft Office

**PROJECTS**

**In-Context Learning with Transformers,** *Carin Research Group, Duke University* **October 2023 – Present**

* Research applications of transformers and large-language models for in-context learning.

**Computer Vision for Resident Education,** *Brain Tool Laboratory, Duke University* **October 2023 – Present**

* Develop a computer vision pipeline to identify surgical tools and quantify surgical performance to improve surgical training.

**Smart Control of Smart Devices,** *Utah Neurorobotics Lab, University of Utah* **August 2022 – Present**

* Collaborate with undergraduate and Ph.D. students to develop a novel joint classification-regression machine learning algorithm, integrating convolutional neural networks and Kalman filters, with electromyography signals as input, to enable people with neuromuscular disabilities to control a smart-home environment with intuitive hand gestures.

**Liquid Neural Networks for EMG Classification,** *Utah Neurorobotics Lab, University of Utah* **June 2023 – September 2023**

* Create a machine learning pipeline, using Python and MATLAB, that uses liquid time-constant networks to classify gestures based on EMG signals.

**Trial-by-Trial Alignment of EMG Signals,** *Utah Neurorobotics Lab, University of Utah* **September 2022 – Present**

* Develop an algorithm that aligns electromyography signals with individual intended kinematic movements. Compare impact of global and trial-by-trial shifts of EMG signals on convolutional neural network and Kalman filter performance.

**Classification of Activities of Daily Living,** *Utah Neurorobotics Lab, University of Utah* **June 2023 – August 2023**

* Worked with undergraduate and Ph.D. students to create a machine learning pipeline to process and classify EMG data from the wrist, forearm, and bicep, using a convolutional neural network. Incorporated Gram-Schmidt algorithm to select EMG channels with highest predictive power.

**RESEARCH EXPERIENCE**

**Carin Research Group,** *Research Assistant* **October 2023 – Present**

* Study variational autoencoders for causal inference and transformers for in-context learning.

**Brain Tool Laboratory,** *Research Assistant* **October 2023 – Present**

* Utilize machine learning and computer vision to improve surgical training.

**Utah Neurorobotics Lab,** *Research Assistant* **June 2022 – Present**

* Research and develop novel machine learning algorithms to improve assistive devices for people with neurological disorders.

**Utah Transportation Research and Artificial Intelligence Lab,** *Research Assistant* **June 2021 – Aug. 2022**

* Worked with a team of Ph.D. students and postdocs to code and train a graph convolutional network long short-term memory (GCN-LSTM) model to forecast and analyze the impact of COVID-19 on traffic volume in Utah.

**JOURNAL PUBLICATIONS**

1. Yaobang Gong, Tanner Isom, Pan Lu, Xianfeng (Terry) Yang, & **Aaron T. Wang**, (2022), “Modeling the Impact of COVID-19 on Transportation at a Later Stage of the Pandemic: A Case Study of Utah,” Journal of Intelligent Transportation Systems: Technology, Planning, and Operations, DOI: <https://doi.org/10.1080/15472450.2022.2157212>.

**CONFERENCE PRESENTATIONS**

1. **Aaron T. Wang**, Connor D. Olsen, W. Caden Hamrick, & Jacob A. George, (2023), “Correcting Temporal Inaccuracies in Labeled Training Data for Electromyographic Control Algorithms,” IEEE International Conference on Rehabilitation Robotics, Podium, DOI: <https://doi.org/10.1109/ICORR58425.2023.10304728>.
2. Abigail R. Citterman, Abigail T. Harrison, Rebecca J. Urban, Kaysen K. Hansen, Marshall A. Trout, **Aaron T. Wang**, Marta M. Iversen, & Jacob A. George, (2023), “Transcutaneous Electrical Nerve Stimulation at the Wrist to Restore Sensory Feedback for Individuals with Partial Hand Amputation,” American Orthotic and Prosthetic Association National Assembly, Poster, DOI: <https://doi.org/10.13140/RG.2.2.11191.70565>.
3. Sophie E. Nelson, Mingchuan Cheng, **Aaron T. Wang**, Connor D. Olsen, & Jacob A. George, (2023), “Classification of Activities of Daily Living from Muscle Activity,” University of Utah Summer Research Symposium, Poster.
4. **Aaron T. Wang**, Connor D. Olsen, Abigail R. Citterman, & Jacob A. George, (2022), “A Reusable, Low-Cost Wristband for Quick Application of Transcutaneous Stimulation,” University of Utah Summer Research Symposium, Poster.
5. Yaobang Gong, Tanner Isom, Pan Lu, Xianfeng (Terry) Yang, & **Aaron T. Wang**, (2022), “Modeling the Impact of COVID-19 on Transportation at a Later Stage of the Pandemic: A Case Study of Utah,” 101st Transportation Research Board Annual Meeting, Poster, #22-01838.

**LEADERSHIP EXPERIENCE**

**Artificial Intelligence Club,**Skyline High School, *Founder, President* **Aug. 2021 – June 2023**

* Introduced members to various machine learning algorithms and current research through hands-on projects, with the goal of inspiring students to further explore AI and machine learning.

**Utah American Regions Mathematics League (ARML) Team,** *Co-captain*  **Mar. 2019 – June 2023**

* Led team members at weekly practices by presenting solutions and tutoring small groups of students.
* Organized and planned team strategy at competitions.
* Mentored eight middle school students during the summer, guiding them through advanced math concepts as an introduction to high school math competitions.

**Math Club,** Skyline High School, *President* **Aug. 2019 – June 2023**

* Recruited new members, doubling membership and participation in competitions.
* Organized weekly lessons on new or advanced math concepts to prepare members for upcoming math competitions.
* Coordinated with advisor to secure funding for contests.

**Utah Science and Engineering Fair Student Advisory Board,** *Board Member*  **May 2022 – June 2023**

* Hosted science fair outreach events to increase participation and interest, including monthly science bowls, science writing competitions, and a science carnival.
* Created lectures and presentations to introduce middle school and high school students to the science fair process.
* Organized fundraising events for the science fair.