Willie **McClinton**

Graduate Student · Research Scientist

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Education

Massachusetts Institute of Technology

Cambridge, Massachusetts

Ph.D. in Electrical Engineering and Computer Science — *Sep. 2021 - present*

- **GPA:** 4.8 /5.0 **Highlighted Honors:** NSF GRFP Recipient ($\sim 16\%$ acceptance) and MIT Presidential Fellowship ($\sim 2\%$ acceptance)
- **Relevant Coursework:** Computational Sensorimotor Learning (A), Robotic Manipulation (A), Theory of Computation (A), Managerial Finance (A), Hardware Arch. for Deep Learning (B), Independent Study in Program Synthesis (Satisfactory)
- **Research Interests:** Machine Learning, Deep Learning, Representation Learning, Task and Motion Planning, and Program Synthesis
- **Skills:** ML Modeling (Tensorflow, Pytorch, Jax, Scikit-learn) — Software Engineering (Python, C++, Javascript, SQL, Go, Bash, Git)
- **Advisors:** Drs. Leslie Kaelbling, Tomas Lozano-Perez, and Armando Solar-Lezama

University of South Florida

Tampa, Florida

B.S. in Computer Science and Minor in Mathematics | Honors College — *Aug. 2016 - May. 2020*

- **GPA:** 4.00/4.00 **Highlighted Honors:** Summa Cum Laude, King O'Neal Scholar (4.0 GPA - top 5 of class >10000), Marshall Scholarship (Finalist), Knight-Hennessey Scholar Program (Finalist), Barry Goldwater Scholarship (Winner), and Dean's List – All semesters

Publications

1. Silver*, T., Kumar*, N., **McClinton, W.**, Zhao, L., Proulx, S., Lozano-Pérez, T., Kaelbling, L., and Barry, J. (2024). *Practice Makes Perfect: Planning to Learn Skill Parameter Policies.* [In Progress] In Preparation for Submission to Robotics: Science and Systems Conference (RSS) 2024.
2. **McClinton*, W.**, Kumar*, N., Chitnis, R., Silver, T., Lozano-Pérez, T., and Kaelbling, L. (2023). *Overcoming the Pitfalls of Prediction Error in Operator Learning for Bilevel Planning.* Best Paper at RSS Workshop on L4TAMP. In the Proceeding of Conference on Robot Learning (CoRL) 2023.
3. Bhardwaj, S., **McClinton, W.**, Wang, T., Lajoie, G., Sun, C., Phillip, I., and Dilip, K. (2023). *Steerable Equivariant Representation Learning.* ArXiv preprint arXiv:2302.11349.
4. Silver*, T., Chitnis*, R., Kumar, N., **McClinton, W.**, Lozano-Pérez, T., Kaelbling, L., and Tenenbaum, J. (2022). *Inventing relational state and action abstractions for effective and efficient bilevel planning.* In The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM) 2022 [Spotlight Talk].
5. Minakshi, M., Bharti, P., **McClinton, W.**, Mirzakhalov, J., Carney, R., and Chellappan, S. (2020). *Automating the Surveillance of Mosquito Vectors from Trapped Specimens Using Computer Vision Techniques.* In the Proceedings COMPASS '20: ACM SIGCAS Conference on Computing and Sustainable Societies.
6. **McClinton, W.**, Garcia, S., Andujar, M. (2019) *An Immersive Brain Painting: The Effects of Brain Painting in a Virtual Reality Environment.* In: Schmorrow D., Fidopiastis C. (eds) Augmented Cognition. HCII 2019. Lecture Notes in Computer Science, vol 11580. Springer, Cham
7. **McClinton, W.**, Caprio, D., Laesker, D., Pinto, B., Garcia, S., and Andujar, M. (2019) *P300-Based 3D Brain Painting in Virtual Reality.* In Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems (CHI EA '19); ACM, New York, NY, USA, Paper LBW1119, 6 pages.
8. Awad, G., Butt, A., Fiscus, J., Joy, D., Delgado, A., **McClinton, W.**, Michel, M., Smeaton, A., Graham, Y., Kraaij, W., Quenot, G., Eskevich, M., Ordelman, R., Jones, G., Huet, B. (2017) *TRECVID 2017: Evaluating Ad-hoc and Instance Video Search, Events Detection, Video Captioning, and Hyperlinking.* TREC Video Retrieval Evaluation (TRECVID), Nov 2017, Gaithersburg, MD, United States. hal-01854790.

Patents

1. *Leveraging smart-phone cameras and image processing techniques to classify mosquito genus and species.* Chellappan, S., Bharti, P., Minakshi, M., **McClinton, W.**, Mirzakhalov, J. US Patent 10,963,742 (2021)
2. *Systems and methods of entomology classification based on extracted anatomies.* Chellappan, S., Minakshi, M., Mirzakhalov, J., Kariev, S., **McClinton, W.** US Patent 11,048,928 (2021)

Research Experience

Boston Dynamics AI Institute
Cambridge, Massachusetts

Research Engineer (1st Intern) *Nov. 2022 - present*

- Developed a Task and Motion Planning system with hand designed skills and perception for BDAII's quadruped robotic dog Spot, as well as integrated a basic simulator enabling IK and FK motion planning, enhancing system efficiency for planning in real-time
- Designed human interfacing capabilities with our planning system utilizing LLMs for automated translation to propositional logic

Google AI Residency Program
Mountain View, California

Research Scientist *Oct. 2020 - Dec. 2021*

- Improved unsupervised and semi-supervised computer vision systems by adding the ability to learn representations that are equivariant to data augmentations during Contrastive Learning, creating a 100x improvement in augmentation time for new datasets
- Exploring the use of Hierarchical Learning for offline reinforcement learning, imitation learning, and transfer learning, specifically in robotics settings.

MIT Learning and Intelligent Systems Group (Dr. Leslie Kaelbling)
Cambridge, Massachusetts

Undergraduate Researcher *Aug. 2020 - present*

- Exploring the use of Hierarchical Reinforcement Learning to learn compositional high-level skills from data that are amenable to task and motion planning.
- Developed new approaches to learn state and action abstractions and neuro-symbolic models for Bilevel Planning in robotics.

MIT Computer-Aided Programming Group (Dr. Armando Solar-Lezama)
Cambridge, Massachusetts

Undergraduate Researcher *Jan. 2020 - May 2020*

- Explored new approaches to combine program synthesis and deep learning in order to improve data efficiency and generalizability in both supervised and reinforcement learning settings.
- Surveyed modern program synthesis and deep learning techniques, for neuro-symbolic programming.

Brown Intelligent Robot Lab (Dr. George Konidaris)
Providence, Rhode Island

Undergraduate Researcher *Oct. 2018 - Aug. 2019*

- Explored the use of Meta-Learning and Hierarchical Reinforcement Learning, specifically the use of high level options, in constructing procedures by which agents can discover new skills autonomously and transfer them effectively to new tasks.
- Implemented modern and traditional RL algorithms (Dynamic Programming, Monte Carlo, TD-Learning, Sarsa, DDPG, A3C, DQN, etc.) and explored research directions in attempt to improve on the convergence speed of existing meta-learning approaches.

USF Neuro-Machine Interaction Lab (Dr. Marvin Andujar)
Tampa, Florida

Software Engineer & Research Assistant *Feb. 2018 - Dec. 2019*

- Developed Unity applications to make BCI more available to the general public.
- Classified brain data with high signal-to-noise ratio using machine learning techniques (LDA, MLP, SVM, etc.) in Matlab and Openvibe.

USF Social Computing Lab (Dr. Sriram Chellappan)
Tampa, Florida

Software Engineer & Research Assistant *Jan. 2018 - Dec. 2019*

- Led a team of 4 to build an Android application that collected and detected distress in users' non-textual SMS message data.
- Incorporated a classifier using Scikit-Learn and Tensorflow to identify user distress from features extracted from the meta-data.
- Created a cross-platform mobile app with React Native integrating deep learning for detecting mosquito disease-carriers with over 80% accuracy, using TensorFlow Lite and Firebase API. Patents: US Patent 11048928 and 10963742.

National Institute of Standards and Technology
Gaithersburg, Maryland

Summer Undergraduate Research Fellow *May. 2017 - Aug. 2017*

- Parsed the YFCC100M and HAVIC databases (>100 Million vids) with SQL to synthesize eval datasets for the competition
- Reduced scoring time by 10x by implementing parallelization in the new Ruby/Rake evaluation
- Collaborated with small team of 3 to manage past systems from previous Multimedia Event Detection Evaluations

USF Computational Biophysics Lab (Dr. Sameer Varma)
Tampa, Florida

Researcher for <Quantify Intrinsic Molecular Motion Using Support Vector Machines> *Nov. 2016 - May. 2017*

- Created command line applications utilizing GROMACS API in C to parse molecular simulations and quantify their intrinsic motion using Support Vector Machines.

Honors & Awards

2022	**Fellowship**, Qualcomm Innovation Fellowship Finalist	*National*
2020	**Fellowship**, National GEM Consortisum Fellowship	*National*
2020	**Fellowship**, MIT Presidential Lemelson Fellowship	*Cambridge, MA*
2020	**Fellowship**, National Science Foundation Graduate Research Fellowship	*National*
2020	**Scholarship**, Marshall Scholarship Finalist	*National*
2020	**Scholarship**, Knight-Hennessy Scholar Program Finalist	*Global*
2020	**Award**, USF King O'Neal Scholar Award	*Tampa, FL*
2020	**Award**, USF Dean's List of Scholars	*Tampa, FL*
2019	**Scholarship**, Barry Goldwater Scholarship ($7500)	*National*
2019	**Award**, The Leadership Alliance's Summer Research Early Identification Program - Participant	*Providence, RI*
2019	**Award**, CRA-W Distributed Research Experiences for Undergraduates Program - Participant ($7000)	*Providence, RI*
2019	**1st Place**, Best Overall Project (Classroom.ai) at KnightHacks	*Orlando, FL*
2019	**Award**, Best Hack for Social Good (Emesh.io) at Hack-A-Bull	*Tampa, FL*
2018	**1st Place**, Best Poster Presentation at USF REU in Ubiquitous Sensing Poster Competition	*Tampa, FL*
2018	**Inductee**, Sigma Xi National Chapter	*Tampa, FL*
2018	**Inductee**, Pi Mu Epsilon University of South Florida Chapter	*Tampa, FL*
2018	**Award**, Best Hardware Hack (Fix8) at Hack-A-Bull	*Tampa, FL*
2018	**1st Place**, Best Oral Presentation in Computer Science Division at Emerging Researchers National (ERN) Conference 2018	*Washington, D.C.*
2017	**1st Place**, Best Presentation in Information Technology Division at NIST Summer Undergraduate Colloquium 2017	*Gaithersburg, MD*

Presentations

[Poster]	**Conference on Robot Learning (Nov. 2023)**, "Over- coming the Pitfalls of Prediction Error in Operator Learning for Bilevel Planning"	*Atlanta, GA*
[Poster]	**Brown University 2019 Summer Research Symposium (Aug. 2019)**, "Meta-Learning with Multi-Level Hierarchies via Context Variables"	*Providence, RI*
[Oral]	**Leadership Alliance National Symposium 2019 (Jul. 2019)**, "Meta-Learning with Multi-Level Hierarchies via Context Variables"	*Hartford, CT*
[Oral]	**Human Computer Interaction International 2019 (Jul. 2019)**, "An Immersive Brain Painting: The Effects of Brain Painting in VR Environment"	*Orlando, FL*
[Poster]	**ACM CHI Conference on Human Factors in Computing Systems 2019 (May. 2019)**, "Effects of 3D Brain Painting in Virtual Reality"	*Glasgow, UK*
[Poster]	**USF Ubiquitous Sensing Poster Competition (Aug. 2018)**, "Deriving Trends from Meta-Data to Predict Distress in Online Communications"	*Tampa, FL*
[Oral]	**Emerging Researchers National Conference 2018 (Feb. 2018)**, "TRECVID Multimedia Event Detection evaluation"	*Washington, D.C.*
[Oral]	**NIST Summer Undergraduate Colloquium 2017 (Aug. 2017)**, "TRECVID Multimedia Event Detection evaluation"	*Gaithersburg, MD*

Community Engagement

[Demo]	**USF Brain Drone Race (Feb. 2019)**, "Mind & Machine: Students to Compete in USF's First Brain Drone Race"	*Tampa, FL*
[Panelist]	**USF Making Waves 2018 (Sept. 2018)**, "Partnership, Mentorship, Scholarship: Discussing faculty-student connections"	*Tampa, FL*
[Demo]	**Roboticon (Sept. 2018)**, "USF Neuro-Machine Interaction Brain Drone Racing Mini-Competition Demo"	*Tampa, FL*
[Demo]	**Orlando iX (Aug. 2018)**, "USF Neuro-Machine Interaction Brain Drone Racing Simulation Demo"	*Winter Park, FL*
[Demo]	**S.T.E.A.M. FORWARD Camp (Jul. 2018)**, "Brain Computer Interface Demo for Middle School kids hosted by USF, FPU, and Intel"	*Haines City, FL*

Leadership Activity

MIT Bitcoin Expo 2024 *Cambridge, Massachusetts*

Co-Director & Lead *Nov. 2023 - present*

- Oversaw the planning and execution of the prestigious MIT Bitcoin Expo, attracting industry experts, academics, and students.
- Coordinated with speakers, sponsors, and MIT staff to ensure a seamless event experience and online Hackathon.
- Led a team of volunteers in organizing workshops, panel discussions, and networking events focused on blockchain technology and its applications.
- Facilitated open discussions on Bitcoin, blockchain, and cryptocurrency, contributing to the advancement of knowledge in the field.

Americorps: Family Services of Rhode Island - Attendance Improvement Matters *Providence, Rhode Island*

Volunteer *Oct. 2020 - Dec. 2020*

- Mentored K-5th grade students in reading, math, and science, while focusing on maintaining attendance in school and virtually.
- Help run Walking School Bus at Harry Kizirian Elementary School, where we walk the kids to and from school from their houses.
- Help instructors work with the technology required for virtual schooling.

Society of Competitive Programmers *Tampa, Florida*

Co-founder & Vice-President & Ambassador *Jan. 2018 - Dec. 2019*

- Created a student organization that helps to foster hackathon culture at USF and supports students in their hackathon trips around the nation.
- Reached over 100 active members in a period of 7 months and helped dozens of students experience their first hackathons.
- Worked with small team of 10 officers to manage the organization's events, budget, travel grants, and outreach.
- Achieved over 20K in funding for competition and conference travel through commercial sponsorship.

Metropolitan Ministries *Tampa, Florida*

Volunteer *May 2018., Jun. 2020 - Sep. 2020*

- Mentored students on First Robotics team and helped them with 3D printers, app development, as well as, technical and career questions.
- Brought donated electronics (Arduinos, Amazon Alexa, servo motors, etc.) in order to spark interest in other technologies.
- Informed instructors about emerging computer science resources, including online tutorials and texts, in order to give them more tools to educate students and stay educated themselves.