479-280-2640 **Jeremy A. Collins** jacollins1999@gmail.com

Website || Google Scholar || LinkedIn

EDUCATION

Georgia Institute of Technology **Aug 2023 – Present**
Ph.D. Machine Learning *Atlanta, GA*

Georgia Institute of Technology **Aug 2021 – May 2023**
M.S. Robotics, GPA: 4.00 *Atlanta, GA*
- Relevant coursework: Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Machine Learning with Limited Supervision, Reinforcement Learning

University of Arkansas **Aug 2017 – May 2021**
B.S. Mechanical Engineering, Minor in Mathematics, GPA: 4.00 *Fayetteville, AR*
- First-Ranked Senior Scholar, Honors College Fellow, Governor's Distinguished Scholar

RESEARCH EXPERIENCE

People, AI, and Robots (PAIR) Lab **Aug 2023 – Present**
Advised by Prof. Animesh Garg *Atlanta, GA*
- Enabling robots to learn from video demonstrations and plan from multimodal input

Healthcare Robotics Lab **Oct 2021 – Aug 2023**
Advised by Prof. Charlie Kemp *Atlanta, GA*
- Led creation of a transformer-based robotic planner that predicts subgoals given a text prompt
- Devised deep learning methods to visually estimate contact in collaboration with Meta Reality Labs

Medical and Soft Robotics Lab **Sep 2019 – Jun 2021**
Advised by Prof. Yue Chen *Fayetteville, AR*
- Designed berry picking robotic gripper and novel peristaltic pump

PUBLICATIONS

- **ForceSight: Text-Guided Mobile Manipulation with Visual-Force Goals**
  Jeremy A Collins, Cody Houff, You Liang Tan, Charles C Kemp
  CoRL 2023 demo. Paper
- **VisiTouch: Visual Fingertip Touch Sensing on Diverse RGB Images**
  Patrick Grady, Jeremy A Collins, Christopher D Twigg, Chengcheng Tang, James Hays, Charles C Kemp
  IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024, CVPR 2023 demo. Paper
- **Visual Contact Pressure Estimation for Grippers in the Wild**
  Jeremy A Collins, Cody Houff, Patrick Grady, Charles C Kemp
  IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2023. Paper
- **Force/Torque Sensing for Soft Grippers using an External Camera**
  Jeremy A Collins, Patrick Grady, Charles C Kemp
  IEEE International Conference on Robotics and Automation (ICRA) 2023. Paper
- **Visual Pressure Estimation and Control for Soft Robotic Grippers**
  Patrick Grady, Jeremy A Collins, Samarth Brahmbhatt, Christopher D Twigg, Chengcheng Tang, James Hays, Charles C Kemp
  IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2022. Paper
- **Tendon-Driven Soft Robotic Gripper for Blackberry Harvesting**
  Anthony L Gunderman, Jeremy A Collins, Andrea Myers, Renee Threlfall, Yue Chen
  IEEE Robotics and Automation Letters (RA-L) 2022. Paper, Patent

SKILLS

- **Programming Languages:** Python, C, C++, Arduino, MATLAB, Java
- **Tools:** PyTorch, TensorFlow, NumPy, OpenCV, Pandas, ROS, OpenAI Gym, Git
- **Other Skills:** Competitive Rubik's Cube solver, trumpet player

INDUSTRY EXPERIENCE

EleutherAI **May 2023 – Present**
Volunteer Researcher
- Exploring text-conditioned image generation with a limited number of text-image pairs

Dorabot **Jul 2021 – May 2022**
Engineering Intern
- Curated datasets for instance segmentation algorithms
- Designed and simulated robotic sorting systems to demonstrate ROI to clients such as DHL

Marshalltown Company **May 2019 – Aug 2019**
Mechanical Engineering Intern
- Improved robotic welding cell, increasing production speed of $3M in products annually
- Quantified manufacturing defect on high-priority product, increasing production by 75%

J.B. Hunt Transport Services **May 2018 – Aug 2018**
Application Development Intern
- Optimized codebase of flagship marketplace software (Shipper 360) to meet user specs
- Debugged Java code, added unit tests, and increased the speed of the platform

DaVoice **May 2015 – Aug 2017**
Quality Control and Logistics
- Directed the sale and shipping of products through Amazon during high school

SELECTED PROJECTS

Robot Learning from Human Feedback **Mar 2023 – Apr 2023**
- Trained a robotic policy by optimizing for human preferences using OpenAI gym
- Crowdsourced data collection by obtaining preferences from video pairs using MTurk

Video Prediction using Latent Diffusion **Sep 2022 – Dec 2022**
- Used a transformer to predict future frame embeddings from Stable Diffusion encoder
- Predicted embeddings are denoised and decoded to produce future video frames

Learning Robotic Tasks from Video Observation **Sep 2022 – Dec 2022**
- Designed robotic system to learn behaviors using video data of expert demonstrations in OpenAI Gym

Multi-Agent Reinforcement Learning **Feb 2022 – May 2022**
- Implemented RL algorithms (SAC, PPO) using TensorFlow to explore human-robot interaction
- Simulated game-theoretic interactions between humans and robots using OpenAI Gym

HONORS/AWARDS

- Coauthor of funded proposal ($60k) from AI-CARING **Oct 2022**
- Southern US Champion – Rubik's Cube Fewest Moves Challenge **Jun 2019**
- Best Poster, 2018 FEP Honors Innovation Symposium (Track 6) **Apr 2018**
- Presented independent research at the Joint Mathematics Meetings (JMM) **Jan 2018**
  - Received travel grant from the Mathematical Association of America
- 1st place, Fall 2017 J.B. Hunt Hackathon **Nov 2017**

COMMUNITY INVOLVEMENT

- Member, AI Safety Initiative at Georgia Tech **Sep 2022 – Present**
- Mentor and judge, HackMIT 2022, 2023 **Oct 2022, Sep 2023**
- Judge, HackGT 2022 **Oct 2022**
- President and founder, UArk Speedsolving Club (Rubik's Cube Club) **Aug 2017 – May 2021**
  - Organized Rubik's Cube competition with 150+ in attendance
- Vice President, University of Arkansas Mathematics Club **Aug 2019 – Dec 2019**