

CAPBOT

2019 ROBOT ALL STAR



Georgia
Tech



Collaborative Apple Picking Robot

Coaches: Ai-Ping Hu, Hemanth Sarabu, and Konrad Ahlin

Stats: “Grasp” and “Search” robot arms collaboratively identify apples using deep learning techniques and plan paths for the Grasp arm to approach and pick apples in an orchard. Each arm is equipped with an RGB-D (color-plus-depth) camera in an eye-in-hand configuration.

Hometown: Georgia Tech Research Institute

Fun Fact: Plans are underway to add a fruit ripeness sensor into the palm of the Grasp arm’s gripper.

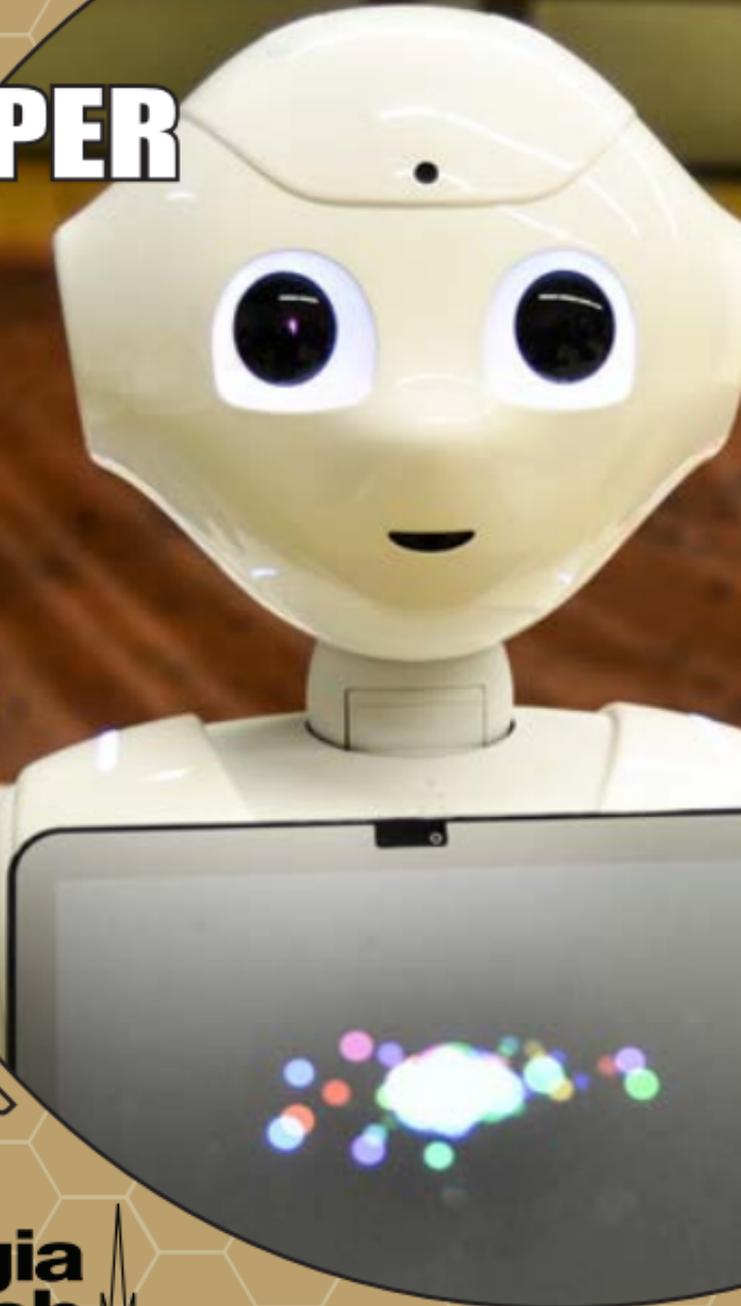


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PEPPER

2019 ROBOT ALL STAR



**Georgia
Tech**



Social Robot Focused on Testing Trust

Coaches: Ayanna Howard, De'Aira Bryant, and Jin Xu

Stats: Pepper offers a multitude of interactive games that may be enjoyed by her human friends. She also embodies a variety of emotions and demonstrates the basic principles of bias and trust.

Hometown: HumAnS Lab

Fun Fact: She's very sassy and loves to dance. Pepper often collaborates with another robot in the HumAnS Lab named Salt and had a cameo appearance in another HumAnS Lab study focused on the needs of patients with dementia.



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GT-OSV

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Autonomous Surface Robot

Coaches: Fumin Zhang and Qiuyang Tao

Stats: GT-OSV is a small and reliable surface vehicle featuring omnidirectional maneuverability and power-efficient onboard artificial intelligence. GT-OSV is a perfect tool for aquaculture inspection, acoustic communication research, and marine robotics education.

Hometown: Georgia Tech Systems Research (GTSR)

Fun Fact: The robot can detect holes in the cage net or if a fish escapes.



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BUZZY CASSIE

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Agile Bipedal Walking Robot

Coach: Ye Zhao

Stats: Buzzy Cassie is a dynamic bipedal walking robot that maneuvers rough terrain and steps over obstacles. Designed by Agility Robotics in Oregon, this legged machine has the ultimate goal of going anywhere people can go or even going beyond human locomotion capabilities. At GT, this robot will be used to evaluate control and optimization algorithms.

Hometown: Laboratory for Intelligent Decision and Autonomous Robots (LIDAR)

Fun Fact: The name Cassie originates from a flightless New Guinea bird similar to an ostrich. Cassie's foot is actually a "toe," given its biological interpretation.



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DUG

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Mobile Manipulation Research Platform

Coaches: Sonia Chernova, David Kent, and Sid Banerjee

Stats: Dug is a Fetch Mobile Manipulator, made by Fetch Robotics in California. Specifically designed for custom research, Dug has a differential drive mobile base for navigation and a 7 degree-of-freedom arm along with an actuated torso for manipulation.

Hometown: Robot Autonomy and Interactive Learning (RAIL) Lab

Fun Fact: Dug is quite cultured and can often be seen sporting a mustache, a top hat, and a monocle, especially around Halloween.

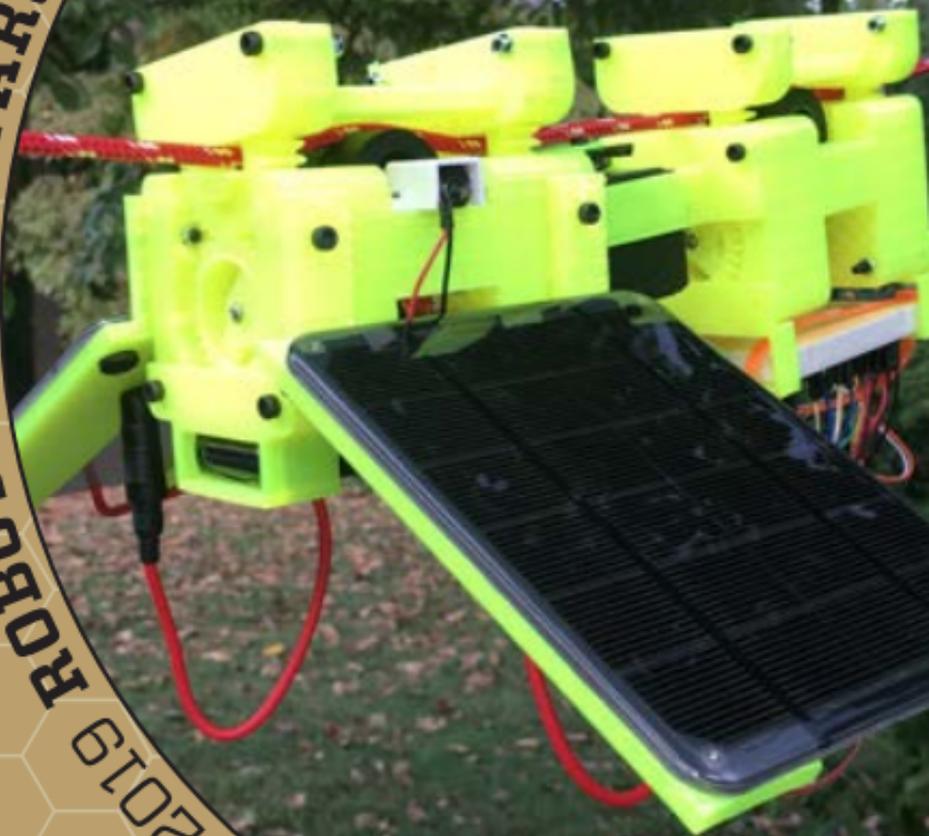


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SLOTHBOT

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Wire-Traversing Robot

Coaches: Gennaro Notomista, Yousef Emam, and Magnus Egerstedt

Stats: The SlothBot is a wire-traversing robot for long-term environmental monitoring. It is a solar-powered, slow-paced, energy-efficient robot, hence its name. The SlothBot is capable of moving on a mesh of wires by switching between branching wires.

Hometown: GRITS Lab (Georgia Robotics and Intelligent Systems Lab)

Fun Fact: The SlothBot is a robot that does nothing most of the time!

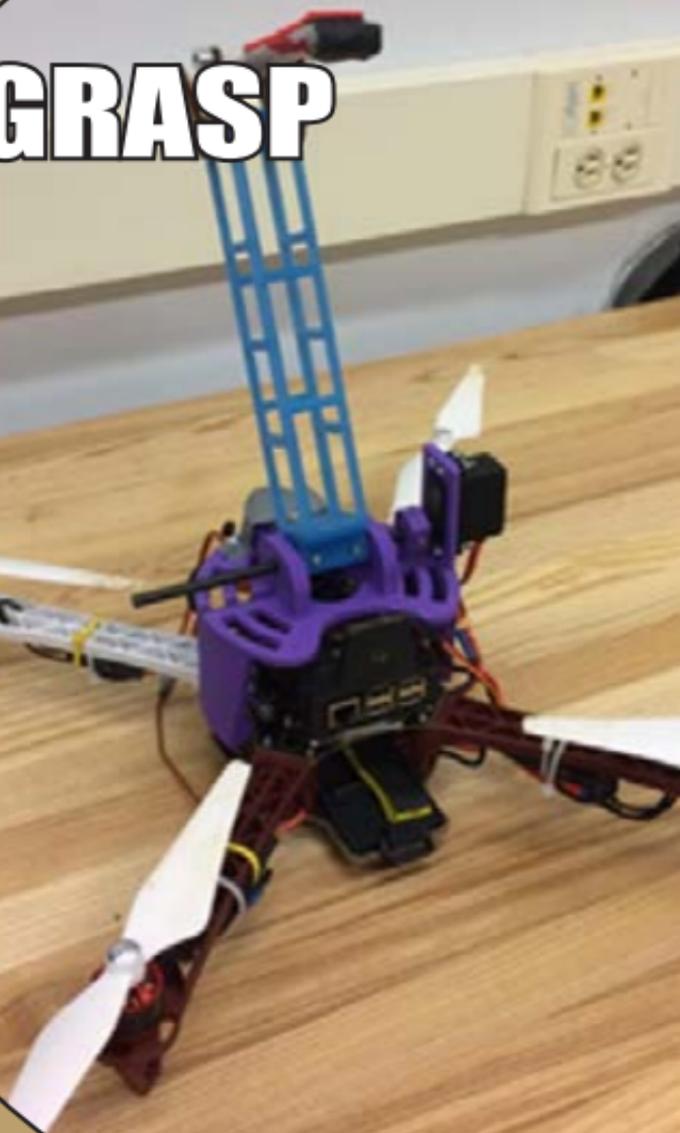


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SKY-GRASP

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Mobile Reflexive Manipulation Robot

Coaches: Anirban Mazumdar, Seok Choi, Rianna Jitosh, Adam Foris, Noe Monterrosa, and Adarsh Sasi

Stats: Sky-Grasp has rapid and seamless interaction with the environment and is equipped with a reflexive gripper. This flying robot enables engagement based on contact, with rapid ($\sim 0.2s$) activation. Sky-Grasp enables powerless hanging and can be reconfigured for delivery.

Hometown: Dynamic Adaptive Robotic Technologies (DART) Lab

Fun Fact: Sky-Grasp's gripper can hold around 20 times its weight!

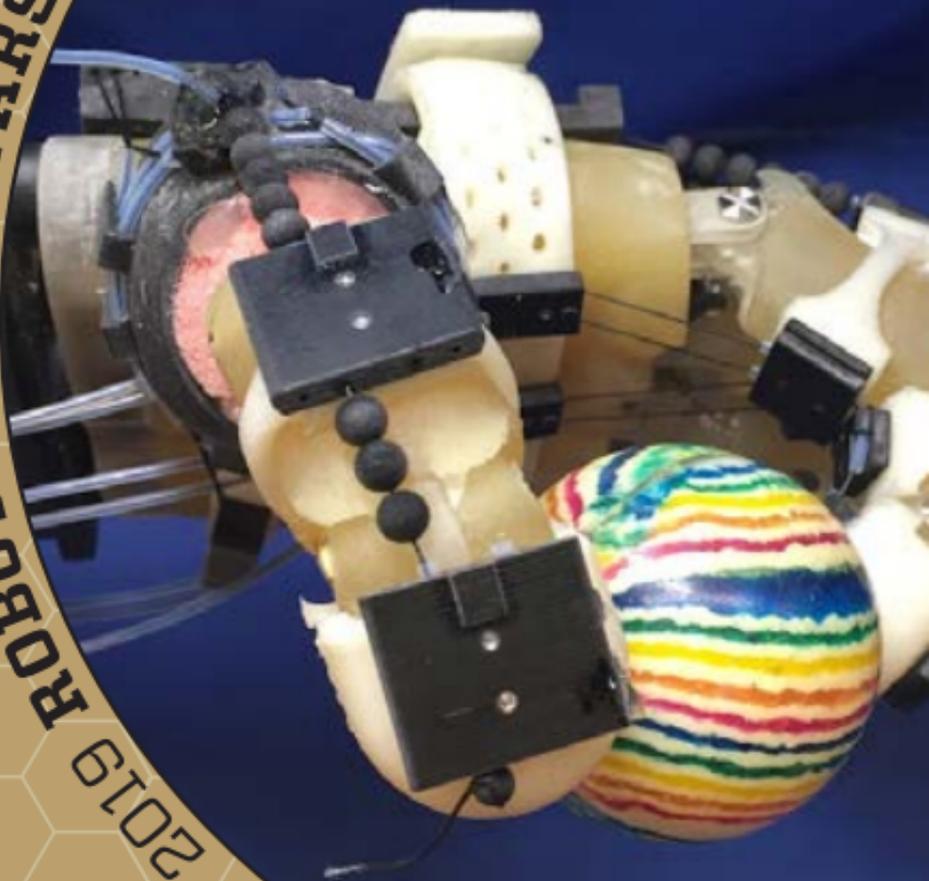


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FLEXOTENDON

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Voice-Controlled Exoskeleton for Rehab

Coaches: Jaydev Desai, Phillip Tran, Seokhwan Jeong, Steven Wolf, and Sarah Callahan

Stats: The FLEXotendon glove functions through voice control and tendon actuation, helping to restore hand and finger mobility and functionality in patients with upper extremity impairments, specifically spinal cord injury and stroke. The patient gives voice commands to a smartphone app, which interprets those commands and informs the exoskeleton to begin tendon actuation.

Hometown: RoboMed Laboratory

Fun Fact: The FLEXotendon glove is a soft robot; every component is deformable and can be custom-molded to the patient's hand and fingers.



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WORMBOT

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Soft Earthworm Robot

Coaches: Frank L. Hammond III, Daniel I. Goldman, Bangyuan Liu, and Yasemin Ozkan-Aydin

Stats: The silicon-made soft Wrobot models the putative earthworm locomotion and anchoring mechanisms by combining soft red Kirigami skin with radially expanding pneumatic actuators. The Wrobot can locomote in several kinds of environments. It may serve as a useful helper for life exploration and perform rescues in collapsed terrain.

Hometown: Adaptive Robotic Manipulation (ARM) Lab & Complex Rheology and Biomechanics (CRAB) Lab

Fun Fact: Its Kirigami skin structure pops up when the pneumatic actuator is radially expanded, forming bristle-like spikes to penetrate soil or other surfaces.

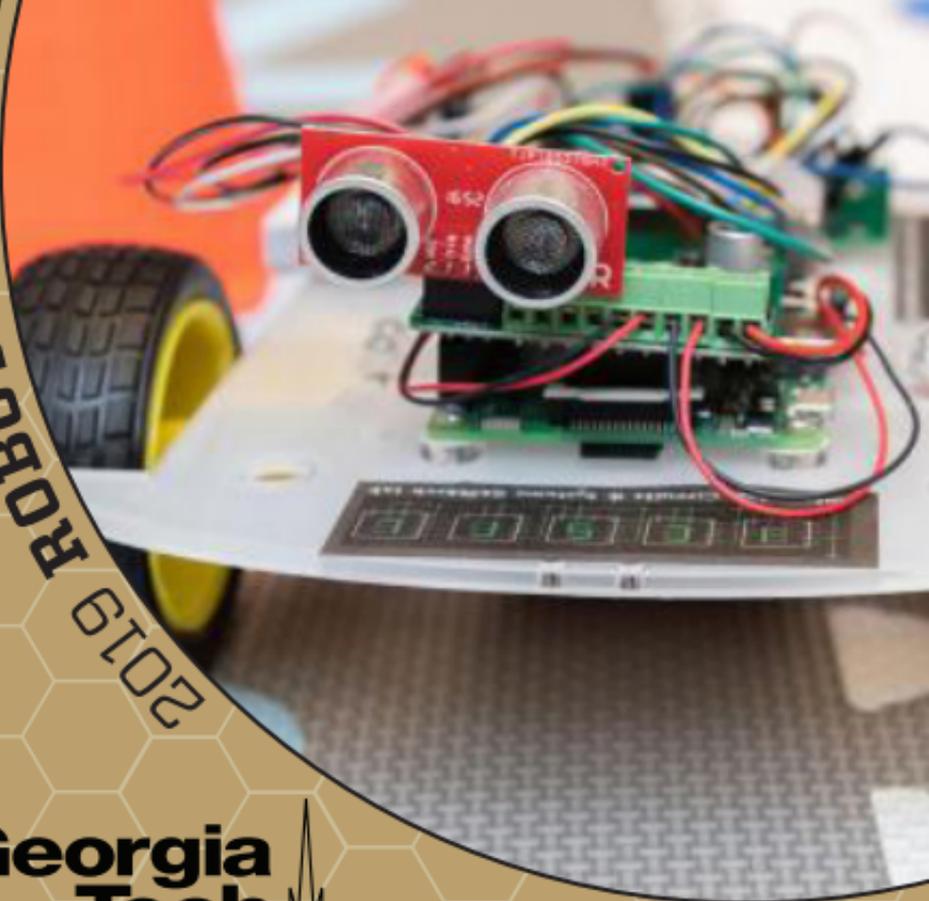


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DRIFTER II

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Reinforcement Learning Robot

Coaches: Arijit Raychowdhury, Ningyuan Cao, Muya Chang, and Anupam Golder

Stats: Specialized processors designed by the coaches integrate with other components allowing DRIFTER II to enable multiple agents for collaboration and optimal decisions. Designed to navigate through interactions with its environment as a team, the small robot has larger capabilities for reconnaissance, search-and-rescue, and other missions.

Hometown: Integrated Circuits and Systems Research Lab (ICSRL)

Fun Fact: The robot uses reinforcement learning; the same algorithm used by Deepmind to beat the human champion in the board game, Go.



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