JOINING THE TEAM

explore your options

beginner

- Typically first and second year students
- Passion for technology, desire to develop hands-on skills
- Limited hands-on experience
- Enthusiastic to spend time on projects

intermediate

- Typically second and third year students
- Previous mechanical design, electrical design or coding experience
- Intermediate members are paired with an expert mentor for guidance
- Will take on semi-independent CAD, coding and fabrication projects

advanced

- Typically fourth year to graduate students
- Significant experience in mechanical design, control, software or robotics
- Leadership role with less intense hands-on work and time commitment
- Mentoring newer members

come and go

Don’t want a long-term commitment?
Feel free to come on for a fixed-length project and go your own way once its finished.

showcase your work

Get a bio on our team website showing all of your contributions.
Sell yourself to future employers.

follow along

Not sure yet? Get on our mailing list and follow team progress. You can start training yourself with the lessons we post. Jump in when you’re ready and earn your member bio.

stay on track

We’ll be with you on every step of the project. You put in the hours, but expert guidance will make sure you have help when you need it.

THE CHALLENGE

“The RoboCup@Home league aims to develop service and assistive robot technology with high relevance for future personal domestic applications. It is the largest international annual competition for autonomous service robots and is part of the RoboCup initiative. A set of benchmark tests is used to evaluate the robots' abilities and performance in a realistic non-standardized home environment setting.”

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Our team was started in 2012 as Thunderbots @home, to compete in the July 2014 RoboCup@home competition.

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The team’s shot at the competition was ambitious; Most teams are at least 6 years old, and have professors and PhDs on board. Thunderbots @home made great progress, achieving basic autonomous operation.

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The @home competition is still in our sights for the future. Our aim is to have our platform completed mechanically and electronically by 2015, developing software and doing mechanical revision to compete in 2016.

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Robocup@Home 2013, unknown team.
image credit: Katrin Binner, Verge.com

Human-Robot Interaction & Cooperation

Navigation & Mapping in dynamic environments

Computer Vision & Object Recognition

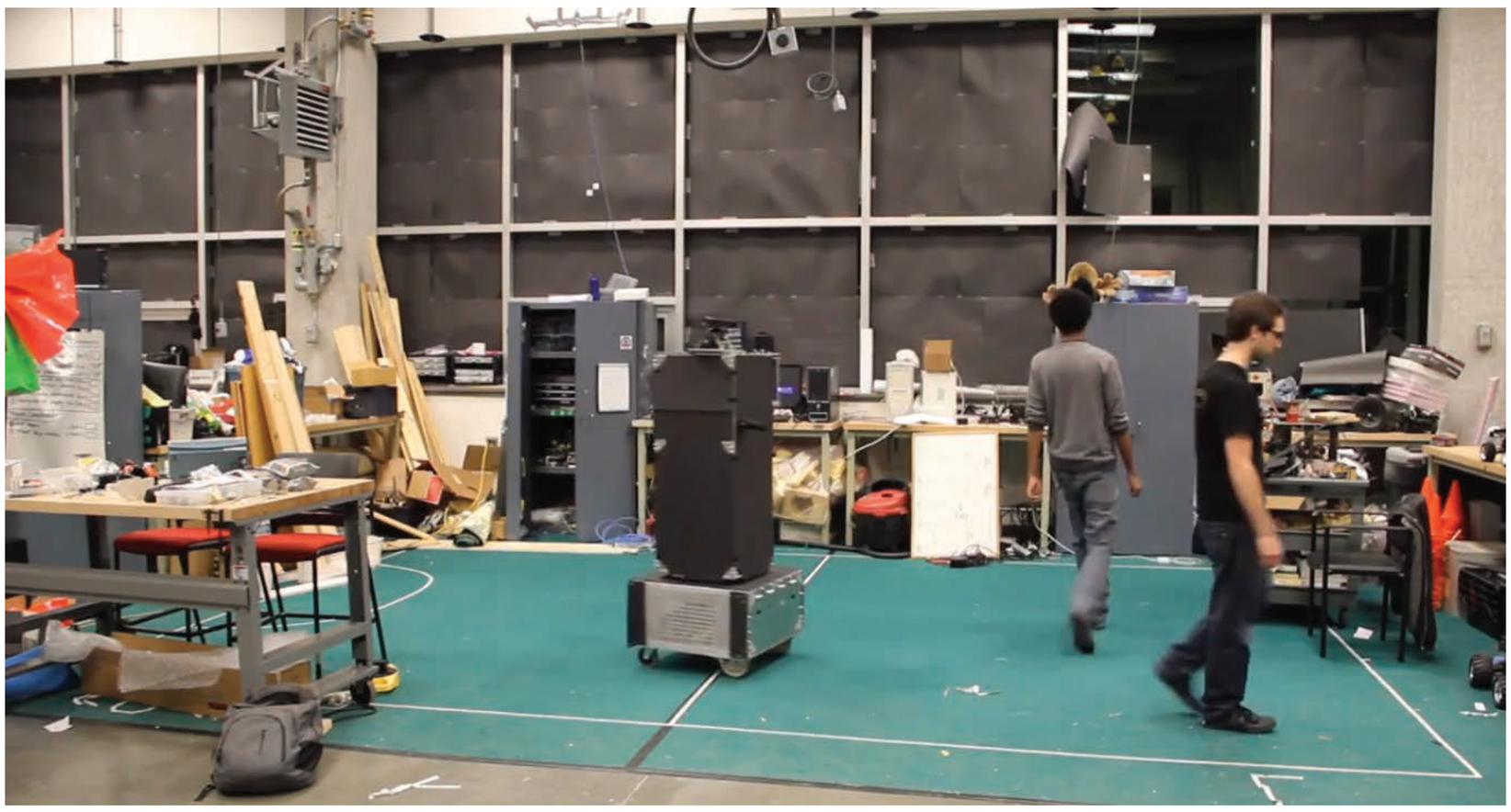
Object Manipulation

Adaptive Behaviors & Behavior Integration

Ambient Intelligence

Standardization & System Integration

COMPLETED PROJECTS



Completed

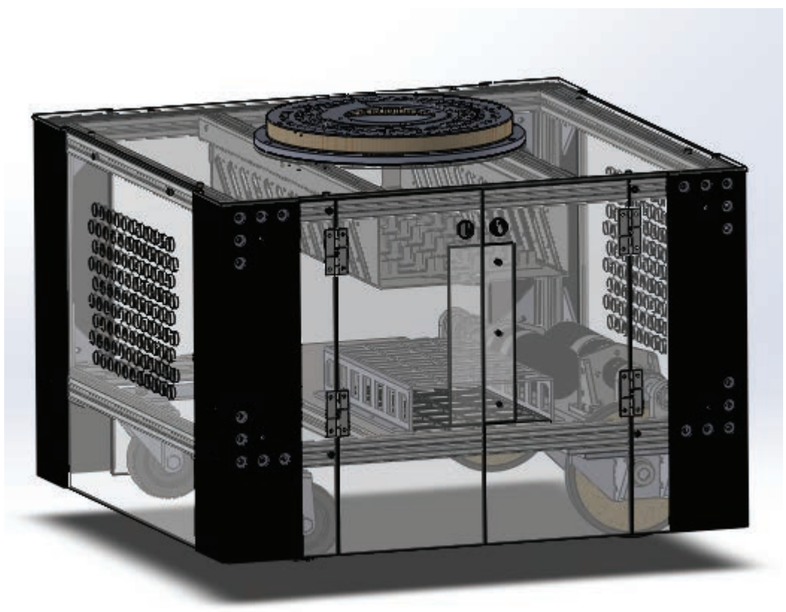
Custom High-performance Computer
Lithium Polymer Battery System
Ultrasonic Sensor Array
Torso and Lazy Susan

In Progress

Compound End Effector
Pan-tilt Head
Custom Shoulder Servo
Experimental Vacuum Grasper

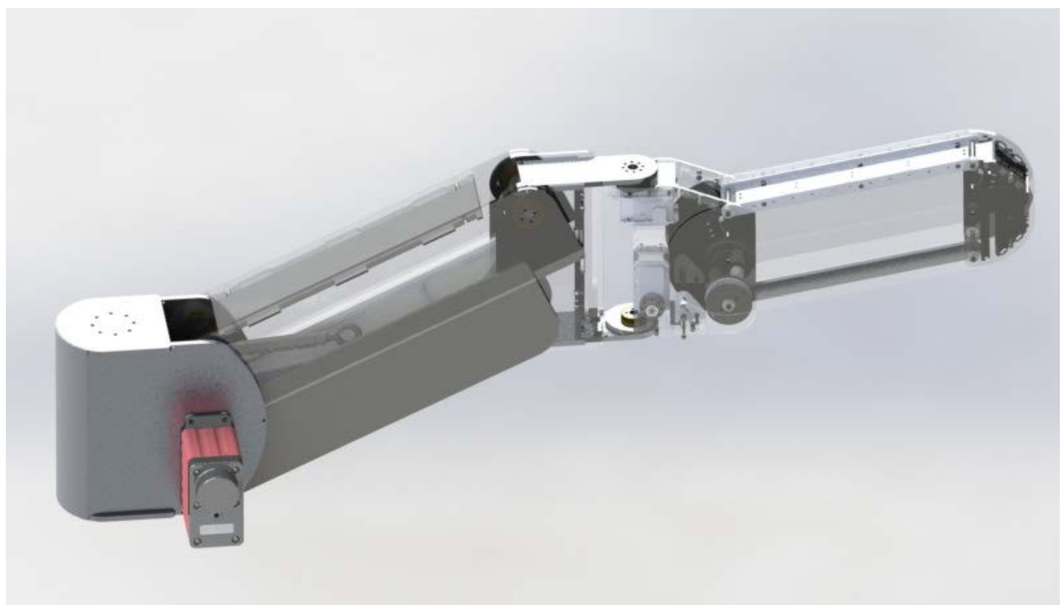
Autonomous Following Program

The robot is programmed to follow a person even if its vision is interrupted.
Following is engaged and disengaged with voice commands.



Drivetrain with Cladding

The drivetrain was designed to be modular, inexpensive, simple, and with minimal machining required for fabrication.



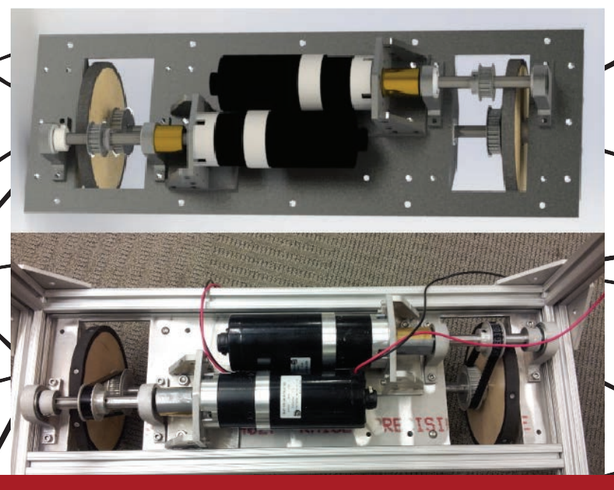
Robotic Arm Mechanical Design

The robotic arm was designed to be iso-elastic, meaning that the entire weight of the arm is supported by a spring system, and the actuators only have to lift the payload in the hand. The arm still needs to be assembled and controlled.

Omni-Directional Drivetrain

Design new drivetrain according to Open Robotics ideology: Simple, inexpensive, easy to manufacture, and open-source

Possibility for elegant solutions and mechanical innovation.



Simplified or Automatic Charging and Startup

Add E-stop, start button, and simplified charging

Bonus: charging station with automatic charging

Project is complete when anyone can follow simple instructions to start and charge the robot with no risk of danger or damage

Robust Wander and Follow Demonstration

Optimize current autonomous following program for easy operation

Modify algorithm so that robot can move randomly through a crowded area while avoiding obstacles

UPCOMING PROJECTS

mechanical	electrical	software
Revision on Robot Head	Wire Robot Arm	Remote Control
Complete Robot Arm	Attractive LED Lighting	Arm Control
Build Robot Hand	Sensor Integration	Absolute Positioning
Attractive Cladding	Infinite Rotation Power	Room Mapping