Robotic Agents (CMPSC 311)

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Get in Touch

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- Office hours:
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- Slack workspace: https://cs311f2019.slack.com/
- Course website:
  http://cs.allegheny.edu/sites/jjumadinova/teaching/311
- GitHub organization
  https://github.com/allegheny-computer-science-311-f2019
Administrative Matters

– No Lab this week (no meeting on Wednesday, August 28)
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– Technology Tea on Thursdays, 2:15 pm - 2:45 pm (starting on September 5)
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– Many photo opportunities
Administrative Matters

- Class exercises: class participation
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Lab assignments (some include community engagement)
Administrative Matters

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- Lab assignments (some include community engagement)
- Presentation assignments
Administrative Matters

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- Lab assignments (some include community engagement)
- Presentation assignments
- Exams: about three
Administrative Matters

- Class exercises: class participation
- Lab assignments (some include community engagement)
- Presentation assignments
- Exams: about three
- Course project (will start end of September)
Administrative Matters

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<tbody>
<tr>
<td>Class Participation</td>
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<td>Assignments</td>
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<td>Exams</td>
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<td>Final Project</td>
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Topics Explored

- Robot Autonomy and Perception
- Robot Control and Navigation
- Communication
- Biologically Inspired Algorithms
- Reinforcement Learning
- Information/Sensor Fusion
- Human-robot Interaction
- Ethics and human-centered robotics
- Grand Challenges
Software/Hardware Explored

- Lego Mindstorm Robots
- Bebop Drone
- LeJOS (Java-based firmware for the Lego robots)
- Robot Operating System (ROS)
- Java, Python and/or C++
- Docker Container Platform
We will be studying the development of robotic agents.
Expanding Computer Science: Agents

We will be studying the development of robotic agents.

An Agent

An agent is a computer system that is capable of independent action on behalf of its user or owner.
Expanding Computer Science: Agents

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An Agent
An agent is a computer system that is capable of independent action on behalf of its user or owner.

An autonomous robot
An autonomous robot is an agent with mobility (hardware) capabilities.
A Multi-Agent System

A multi-agent system is a system that consists of a number of agents which interact with one-another.
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Multi-Agent Systems

Multi-agent systems are based on **autonomous, intelligent** agents, and include properties of:

- autonomy,
- reactivity,
- proactivity,
- social ability.
From a Multi-Agent to a Multi-Robot System

Add hardware constraints (noise)
Remove assumptions (movements)
Think of a robot that you know/heard of (real or fictional).
Getting to Know Each Other

- Think of a robot that you know/heard of (real or fictional).
- Identify three ways in which you are similar to the robot.