

AREA

Awesome Robot Enters Assemble

May 12, 2016, 4:00 pm to 6:00 pm at Assemble PGH
Presented by John Choi

Synopsis:

Three activities will be played out at Assemble where middle schoolers engage with a giant robot to learn about the three fundamental concepts of robotics: **actuation**, **cognition** and **perception**. Each activity takes roughly 30 minutes and can be played multiple times. Descriptions for each activity are listed below:

Robot Musical Chairs: Like the classic game Musical Chairs, players dance around to the beat of a dancing robot! When it stops moving, children will sit down on chairs, where every there is one less chair every round. The winner is the last one standing.

Rules:

- Start with one less chair than there are players, and put them around in a circle.
- Whenever the robot is moving, the players will go around the chairs.
- When the robot stops moving, all players except for one will sit down on a chair.
- The player that did not find a seat is out, and one chair is removed from the circle.
- We repeat this until there is only one player remaining in the circle.

Note that the robot is controlled by a human operator, to be changed every round. Students will observe the robot to understand how the robot moves (actuation).

Robot Commander: Players tell a robot how to get from point A to point B with a series of step by step commands: move forward (F), move backward (B), turn left (L), turn right (R).

Rules:

- Set the robot at an arbitrary starting point A.
- Place a goal within 5-10 feet of the robot, point B.
- Give the robot 1 instruction (F,B,L, or R) at a time to get closer to point B.
(Do this as many times as necessary to get to point B.)
- Once point B has been reached, we select another goal point and do this again.
- However, the second time, we send 4 instructions at a time.
- The third time, we send 8 instructions at a time.

This game is designed to allow students to understand how robots plan their actions through a series of coordinated steps to achieve their goals (cognition).

Robot Hide and Seek: Players get to experience telepresence by trying to find a hidden stuffed animal while controlling the robot from a remote computer. Players will have to compensate for lag, a limited field of view, and limitations in the robot's environment.

Rules:

- Two computers are connected via video chat, one on the robot and one on a desk.
- A stuffed animal is hidden in a room where humans cannot go, but a robot can.
- Players look to the screen on the desk, and direct where the robot goes.
- The game ends when the stuffed animal is found.

Similar to real world remote operation of robots in hazardous environments, this activity demonstrates to players the limitations of how robots perceive their surroundings (perception).