COMP 150: Developmental Robotics

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This Week

- Brief history and overview of robotics
- Getting started with robot simulators
Announcements
North-East Robotics Colloquium

• Held at Northeastern University on Saturday October 21st
• [https://nerc2017.ccis.northeastern.edu/](https://nerc2017.ccis.northeastern.edu/)
• Deadline for registration: October 15
• $50 dollars for graduate students, $10 for undergrads
• Extra credit if you attend – let me know if you will
Homework 1 is out!

- Solution should be in PDF format
- LastnameFirstname_HW1.pdf
- Due Thursday Sept 22\textsuperscript{nd} by midnight
- Send by email to jsinapov@cs.tufts.edu
  subject: [comp150]
Class Discussion: Principle of Subjectivity

If two robots have been constructed to be identical, is it possible to train only one, and then pass the code (or “knowledge”) to the other one, with the resulting robots being identical in behavior?

What if the robots are not physically identical?

Does the answer depend on what precisely the robot is learning?
A Brief History of Robotics

First introduced in the play *R.U.R. (Rossum's Universal Robots)* which opened in Prague in January 1921.

The word ‘robot’ is derived from the Czech word for forced labor or serf.
Early Depiction of Robots in Movies
Definition

“re-programmable, multi-functional, manipulator designed to move material, parts, tools, or specialized devices through variable programmed motions for the performance of a variety of tasks”

– Robotics Industry Association (RIA)
A Brief Timeline
Mechanical Duck

Jacques de Vaucanson (1709-1782)
Radio-Controlled Submarine

[Nikola Tesla, 1898 (patent #613809)]
Walter's Turtle

[Grey Walter, 1948-49]
Walter's Turtle

BRISTOL'S ROBOT TORTOISES HAVE MINDS OF THEIR OWN

[BBC Report ~1949]
The “Beast”

1960

[John Hopkins University Applied Physics Lab]
First Industrial Robot

First Industrial Robot (~60s)
The Stanford Cart

1970

[Stanford University, 1970]
Shakey

[Stanford Research Institute, 1970]
Video
Video

• What the entire video at:

https://www.youtube.com/watch?v=GmU7SimFkpU&t=374s
Genghis

[Rodney Brooks, MIT, 1989]
Sojourner

[NASA, 1997]
Honda's Humanoids

[1986-2011]

[Honda, 1986-2011]
Military Robots
The Cheetah

7.0 mph
Big Dog

[Image: A robot dog carrying backpacks in a forest]
Big Dog
Sony's Robot Dog
Androids

[Honda, 1986-2011]
Geminoid Summit
The Uncanny Valley

- Moving: ____________
- Still: ____________

familiarity

human likeness

uncanny valley

bunraku puppet

healthy person

humanoid robot

stuffed animal

industrial robot

corpse

prosthetic hand

zombie
The Uncanny Valley
Next time...

- What are the major practical and research questions in robotics?
- Mapping and Localization
- Movement and Control
- Perception and Cognition
- ...