CS 378: Autonomous Intelligent Robotics

Instructor: Jivko Sinapov

http://www.cs.utexas.edu/~jsinapov/teaching/cs378/

Announcements

Volunteers needed for a demo on 2/19 between 10 am and noon.

Email me if you are interested in helping out

Announcements

FRI Summer Research Fellowships:

https://cns.utexas.edu/fri/beyond-the-freshman-lab/fellowships

Applications are due March 1st but apply now!

Funding is available for 4-5 students per FRI stream

Announcements

You are invited to attend our bi-weekly UT Robotics seminar taking place tomorrow.

When: Wednesday 2/10 at 4pm

Where: GDC 4.304

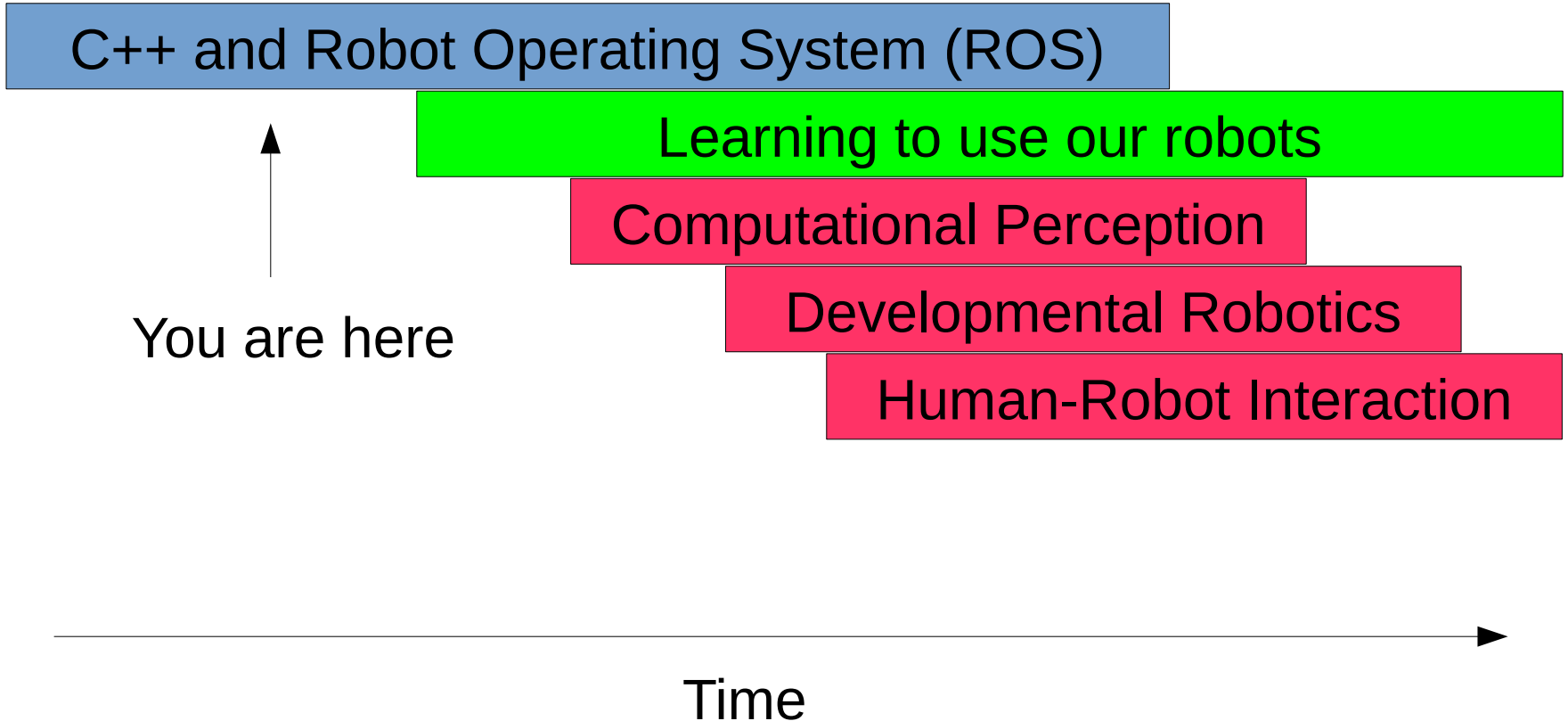Speaker: Mitch Pryor, PI of the Nuclear and Applied Robotics Group.

Website: http://robotics.me.utexas.edu
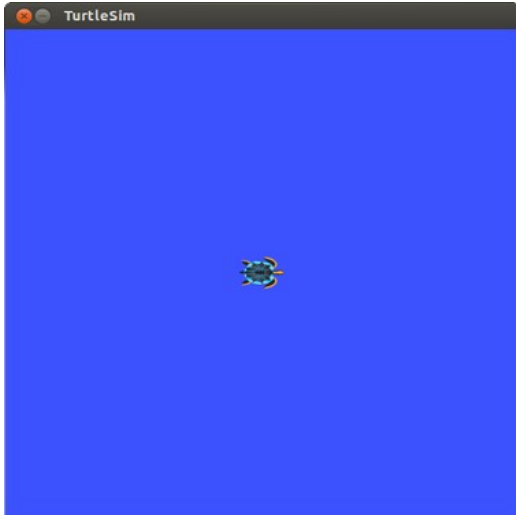
Announcements

Homework 1 grades are out

Homework 2 is due Thursday night

Semester Schedule

C++ and Robot Operating System (ROS)

Learning to use our robots

Computational Perception

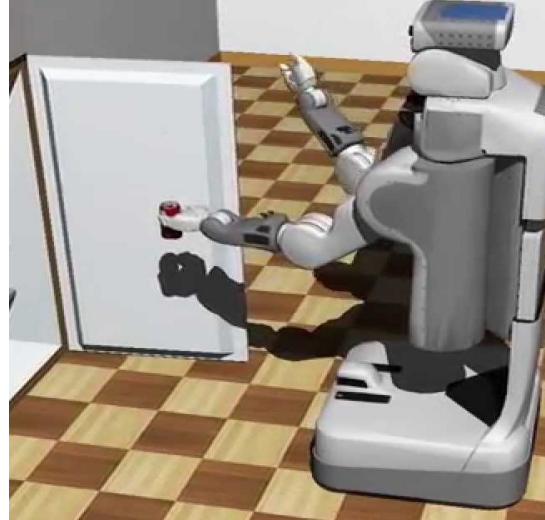Developmental Robotics

Human-Robot Interaction

You are here

Time

Progression

2D simulation

3D simulation

Real World

Reading Discussion

"One of the most interesting points mentioned was the fact that robots can advance in age by "increasing the strength of [their] neural interactions," thus reducing their tendency to commit "A-not-B" errors; I wonder what the timeline for this strengthening is, and how it relates to the time it takes humans to neutrally develop (e.g. if robots adjust at a faster, slower, or approximately equal rate)."

- Jacqueline

Reading Discussion

"Where did the babies used in this study come from? Did they have relatively similar genes? Or did the researchers use randomness or a large enough sample size to ensure that the conclusion can be generalized to all babies? Also, some of the specific age choices were not explained such as the study with children aged 12, 15, and 18 months."

- Calvin

Reading Discussion

"This research paper made me think about Jesse's study with I Spy. I wonder how he was able to make the robot learn the words (I'm sure it's more complicated to explain than I think). I also wonder if the things outlined in the article were things that he had to take into account when programming his robot. I think that some of the ideas of learning were the same, such as object placement and picking a specific object. Of course, right now all of it is out of my scope of understanding. "

- Kiana

Reading Discussion

"1) Would a robot ever have need to forget an action only to relearn it later in a more coherent manner (such as the "stepping" phenomena that occurs with babies)?

2) An interesting point was made in the dynamic explanation of a goal-directed action. It stated (perhaps obviously) that the learning process behind a successful action varies by individual. Is this the idea used in the training soccer robots that we have in the lab? Are all those robots trained individually or can the development of one robot be copied over to another?"

- Saket

Reading Discussion

"I would especially like to learn about how growing up in different settings affects learning in different ways. … I am very curious about how growing in a very rural environment— say, the Mongolian steppes— affects learning and development as opposed to growing up in Hong Kong or how growing up in a more impoverished area affects growing up compared to Beverly Hills."

- Zara

Reading Discussion

"We have gone through several papers now that consider the importance of dynamism and reaction to one's environment. However, I really feel like none of them have touched the core of the problem - how do we get robots to adapt to their dynamic environment, and why does this specific approach matter to that greater goal? Everything seems to be tiny pieces on the periphery of a large, looming problem, but few of seem to make a concrete connection to this greater problem."

- Vincent

Readings for this week

Thelen, Esther, et al. "The dynamics of embodiment: A field theory of infant perseverative reaching." Behavioral and brain sciences 24.01 (2001): 1-34.

Butko, Nicholas J., and Javier R. Movellan. "Learning to look." Development and Learning (ICDL), 2010 IEEE 9th International Conference on. IEEE, 2010.

Hülse, Martin, Sebastian McBride, and Mark Lee. "Developmental robotics architecture for active vision and reaching." Development and learning (ICDL), 2011 IEEE international conference on. Vol. 2. IEEE, 2011.

Today

How to write a simple controller for the turtle in turtlesim

What should the turtle do?

- Move the turtle (forward or backward)
- Draw a circle
- Add more turtles
- Chase something (another turtle?) in the map
- Respond to text commands
- Control turtle with a mouse

What should the turtle sense about the world?

- The boundaries of the space
- Its own coordinates and orientation (in ROS when you have position +orientation = pose)
- Other agents or objects

Let's get to it....

THE END