

CMSC 479/679

Fall 2015



Dr. Cynthia Matuszek



Bookkeeping

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By now:

- ◆ Have read SNS 2.1, 2.2
- ◆ Have a Piazza account
- ◆ Have 1-2 ideas or interests to discuss with the group



Today's Class

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◆ Teams

1	2	3	4	5	6	7
Ashwin	Catherine	Grayson	Kevin S.	Mike B.	Chi	Grace
Gurpreet	Haven	Tim	Bruce	Neil	Christian	Megan
Kourosh	Kendal	Alex	Christian	Jeff	Travis	Keith
Terry	Yonatan	Shari	Michael T.	Raph	Kevin C.	Ilana
Nisha	Matt		Zachary	Brian	Max	John C.

◆ Sample Project Ideas

◆ Group Discussion



Project Characteristics

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- ◆ Physicality
 - ◆ Must **interact with the world**
 - ◆ Read from a sensor
 - ◆ Perform actuation
 - ◆ Create an object
 - ◆ Learn from physical input
 - ◆ Interact with a human (not just a screen)
- ◆ Novelty
 - ◆ Originality in...
 - ◆ Action
 - ◆ Detection
 - ◆ Idea
 - ◆ Artifact
- ◆ Application-oriented
 - ◆ How would this ultimately be used in a robot scenario?
 - ◆ What's the "big vision" your project fits into?

These are necessarily fuzzy, but keep in mind when discussing ideas.



Components Available

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- ◆ Input Devices
 - ◆ Myo
 - ◆ Amazon Echo
 - ◆ Webcams
 - ◆ Fitbits (etc)
 - ◆ Smart watches
 - ◆ Phones
 - ◆ Tablets
 - ◆ Cameras
 - ◆ Nest
 - ◆ Kinect
- ◆ “Output” Devices
 - ◆ Manipulator arm(s)
 - ◆ 4-wheel mobile base
 - ◆ Nest
 - ◆ Amazon Echo
 - ◆ Smart watches
 - ◆ Phones
 - ◆ Tablets
 - ◆ Pan/tilts
 - ◆ Motors
 - ◆ WeMo stuff
- ◆ Builds
 - ◆ New actuators
 - ◆ Wheelchairs
 - ◆ Prostheses
- ◆ Robots
 - ◆ Beam
 - ◆ Jaco arms
 - ◆ Husky base
 - ◆ UAVs
 - ◆ Other (lots)



Tools

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- ◆ IFTTT – If This, Then That
- ◆ ROS – Robot Operating System
 - ◆ C++
 - ◆ Python
- ◆ Open CV – vision processing



Possibilities

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- ◆ “Universal” button-pushing remote
 - ◆ End-effector design
 - ◆ Mounted to manipulator?
- ◆ Manipulator on Beam telepresence robot
- ◆ Natural language control of devices
 - ◆ “It’s too hot in here” – contact the Nest
- ◆ Device control via gaze tracking (iPad)
- ◆ Facial expression recognition and response
 - ◆ Squinting? Turn down the light



Possibilities

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- ◆ New apps for controlling hardware
- ◆ Better (learned) models of the environment
 - ◆ Mapping and localization of, e.g., glass walls
 - ◆ UAV-based
- ◆ Faster, better, different learning of
 - ◆ Visual data
 - ◆ Knowledge bases and sources
- ◆ Myo manipulator controller
- ◆ Object retrieval and delivery
 - ◆ NL-based



Group work

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- ◆ Everybody get names and email of everybody!
- ◆ Pick a first meeting time
- ◆ Discuss projects and interests
 - ◆ Which input devices?
 - ◆ What capabilities?
 - ◆ What area? (cognition? manipulation?)
- ◆ Send me all of this and post it



For Next Time...

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- ◆ Post 2 ideas to Piazza as a group
- ◆ Send Dr. M and Nisha:
 - ◆ Link to post
 - ◆ Group name, email addresses, and ideas
- ◆ See Dr. M about group problems
- ◆ Readings:
 - ◆ SNS 2.3
 - ◆ SNS 2.4
- ◆ Start playing with IFTTT