Mixed Reality and Tangible interfaces
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**Project:** Combine Mixed Reality, Tangible and/or Touch interaction to create in pairs an AR game/help/something like it 😊

AsteRoids – AR Shooter (on appleStore)
Your Task (project)

Option 1: Treasure hunt

- Use AR markers at different locations or objects in a room.
- As you reach each marker see through your device for clues to where the next marker in the hunt is located.
- To get each new clue you need to solve a puzzle (using touch or tangibles)
  - manipulate the size and orientation of a 3D object attached to the marker using gestures until it reaches a predefined goal,
  - solve a 2D puzzle by dragging and rotating pieces,
  - physical puzzles (e.g. need to move a specific physical item close to another to unlock the clue),
  - etc.
- Then give the clue in relation to the current marker (e.g. using arrows to indicate you need to move to the left and by how much)
- Don’t let your users cheat by jumping to markers out of sequence.

Lots of AR treasure/scavenger hunts in progress …
Your Task (project)

Option 2: User instructions
We are surrounded by complex machinery (e.g. laser cutters and 3D printers in the FabLab), why not use AR and HCI to help people?

• Use markers on different parts of complex machines with instructions on how to use them and what to do next.
• If machinery is too hard to bring in class (!), how about using markers to teach someone how to create a paper boat or other origami?
• Instructions should be visual (e.g. arrows for how to fold the paper or open the hutch in the laser cutter) and adapt to what your camera sees.
• Combine with interactions on your mobile device
  • e.g. swipe to see prev/next step,
  • get more info on existing components,
  • load virtual enhancements (e.g. possible 3D attached accessories, a 3D boat, and use touch to scale/rotate them, etc).
• Try to deal with errors (e.g. if no markers are seen give option to go back).

Lots of work on AR+hci for construction, fabrication, instruction ...
Your Task (project)

Option 3: Your idea

• Should have AR + touch/tangible components
• Check topic with Anastasia or Jean-Marc
Your Task (project)

Real time AR:
✓ Recognize markers and attach information to them
✓ When needed, adapt virtual info based on the marker position in view

Interaction (use at least 2 of):
✓ Widgets for different actions,
✓ Touch gestures for common virtual object manipulation (e.g. scale, rotate, translate),
✓ Combine the above with physical objects for tangible interaction,

And any other extensions you can think of !!!

Remember:
To get a good grade you should be creative,
    BUT you also need to have a demo that runs !!!
Technical/ Practical

• Example code will be provided (Android + Unity) (you can visit FabLab to cut pieces if needed)
• “office hour” T.B.A. if there are questions/issues

On your own:
✓ Install an Android SDK that matches your device
  (instructions to come on class web, and, well, the web 😊)
✓ Try out the example code from the website on your device
✓ If you don’t have a device we will find one for you
  (talk to Anastasia to arrange pickup)

In the office hour:
✓ If you run into problems bring your laptop and device
The “exam” will be in pairs and will include:

- **Presentation of project (15 min strict – we will stop you if you go over)**
  - The presentation time should be made around the demo
  - Include your design decisions, challenges and additional features
  - Set up and test everything before presentations start !!!
  - Send us your code and a summary (1 page max) of your app with images !!!

- **Comprehension questions (1-2) on the class material**
  - You don’t need to memorize things, you can have your notes
  - **but** you need to understand class material if you need to find something fast