

mixed reality
&
(tactile and) tangible interaction

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class project



AsteRoids – AR Shooter (on appleStore)



AR magazine



ARcraft

Important DATES

Mon 18/11 @23:59 or earlier: Upload project proposals
(1 paragraph to 1 page MAX)

Mon 16/12 @23:59 or earlier Upload:
project mini-report, an image, and a video (upload the link)

Tuesday 17/12/2024 @ 9:00 Demo project



AsteRoids – AR Shooter (on appleStore)



AR magazine



ARCraft

Project Goal:

Combine

Mixed Reality and

Tangible and/or Touch interaction

to create an AR game, help/instruction, etc 😊



AsteRoids – AR Shooter (on appleStore)



AR magazine



ARcraft

Your Task (project)

Real time Augment Reality:

✓ Track multiple physical/real world objects (e.g., using markers) and attach virtual information to them (e.g., projector, through a device)

Interaction with Physical Objects:

✓ Adapt virtual info based on user interaction with the physical objects (e.g., relative position/orientation of objects)

Interaction with Virtual objects:

✓ Adapt virtual information based on user interactions that can go beyond the physical (e.g., provide widgets; touch or mid-air gestures for common virtual object manipulation like scale, rotate, translate; combine the above with physical object interaction)

And any other extensions you can think of !!!

To get a good grade you should be creative,

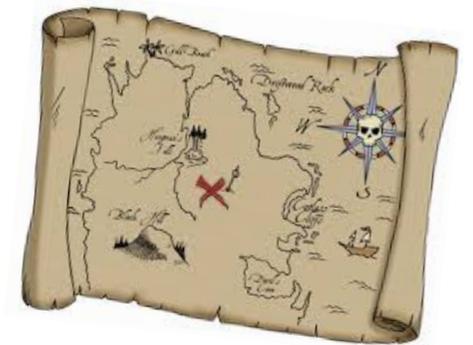
BUT you also need to have a demo that runs

Your Task (project)

Option 1: Treasure hunt or game

Example:

- Use AR markers at different locations or objects in a room.
- As you reach each marker, you look through your device for clues to where to find the next marker in the hunt.
- To get each new clue you need to solve a puzzle (using touch & 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 ...

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?

Example:

- 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 show, 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 in the physical world (e.g. if the paper is folded, show arrows for how to make the next fold, or if the hutch of the laser cutter is open, give instructions to close it) .
- Combine with interactions on your mobile device
 - e.g. swipe to see prev/next step, request with buttons 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).

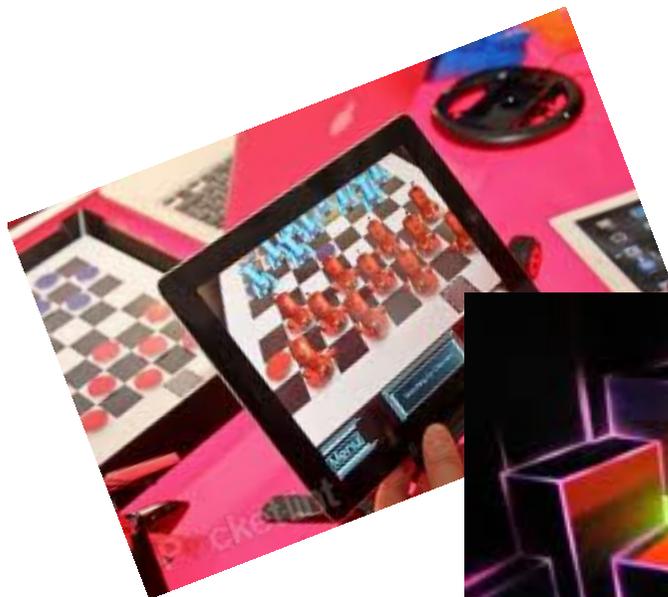
Lots of work on AR+hci for construction, fabrication, instruction ...



Your Task (project)

Option 3: Come up with our idea (create or teach a game or concept, teach a musical instrument, augment a book, augment parts of your house, make a virtual task tangible, ...)

- Should have AR + touch/tangible components (see slide 5)
- Check topic with us
(depending on complexity we may reduce/relax requirements)



Technical/ Practical

You can visit FabLab to cut/print pieces if needed.
Contact us about it.

On your own:

- ✓ Unity, our tutorial is a start, tons of tutorials on the web
- ✓ Try out example code (next week) on your device
- ✓ If you run into problems let us know

If you don't have a device we will find one for you (talk to us)

Project Proposal

Think about your project and create your teams (2-3 people). Start working on it early!!! (If you are looking for team-mates you can post on the forum)

Upload a **1 paragraph - 1 page** description of your idea (the earlier the better) in e-campus. Mention if you are combining it with other classes.

Upload the description by Nov 18th

- (i) You can start early and send the description before that date
- (ii) This is not a contract :), your project can evolve after that !!! The idea is to see if you are on the right track.



Project Presentation

The project will be in groups of 2-3 and will include:

a Demo of the project (~**10** min) on **last class (December 17th @9am)**

The presentation time should be made around the demo (no slides needed)

Discuss your design decisions, challenges, and features

Set up and test everything before presentations start

The day before of the presentation (Mon 16th @ 23:59), upload 3 files:

- a summary doc (1-2 pages) describing the idea behind your application.
- a high-res image of your demo
- a short video (~3-5 min) of your demo running. Great for your portfolio but also Jeanne will not see the demo, so your video is very important for your mark too!!!



Peer-Feedback of demos

For each presentation, you will provide brief feedback to your colleagues.

Consider taking notes during the presentation and posting them afterwards (links will be provided in e-campus)

Always the same questions:

What did you like in the presentation?

What could have been improved?

Any question for the presenters?

past projects



AR dj



AR spells



4D tower defence



AR workspace

past projects



Tangible video editor



World map



Archer

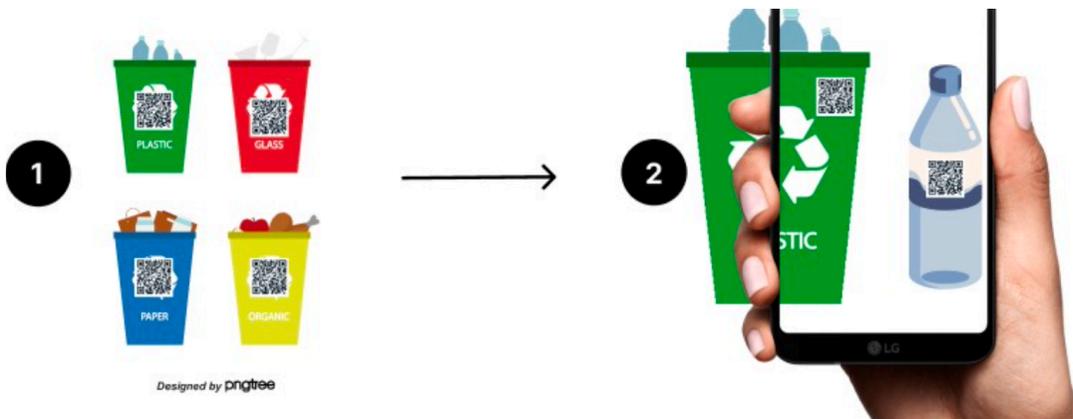


AR marble

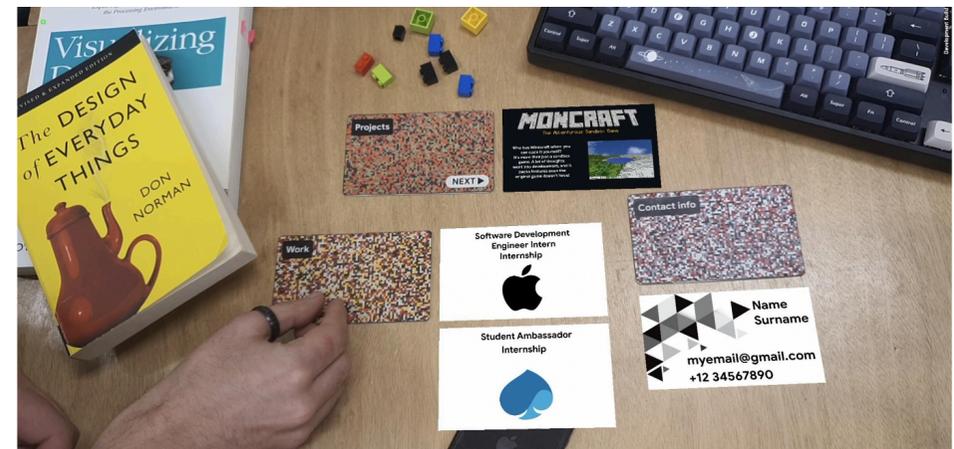
past projects



AR Zen Garden



Hit the Bin (AR recycle game)



AR Business Card + CV