

# Team Practical Course on AR and VR Research

## 01 – Research Areas

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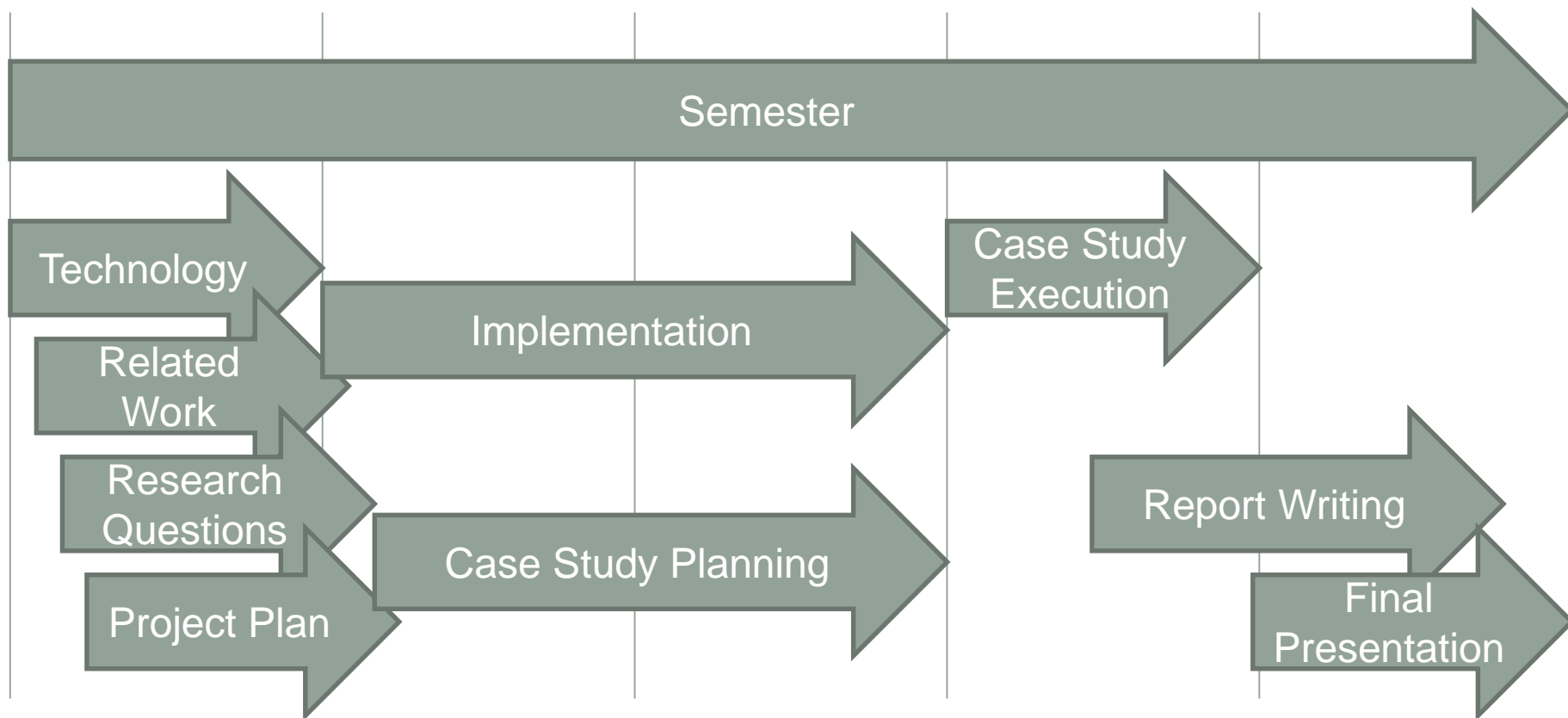
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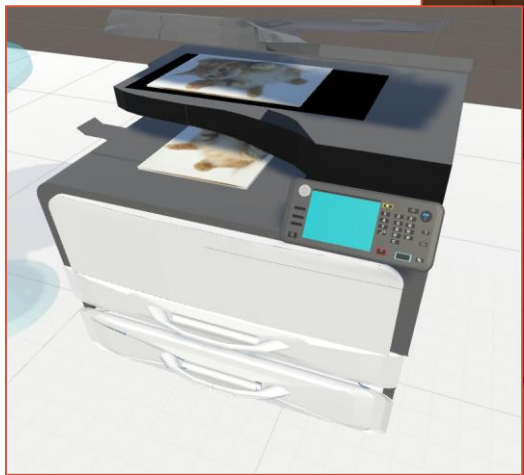
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# Basic Course Structure

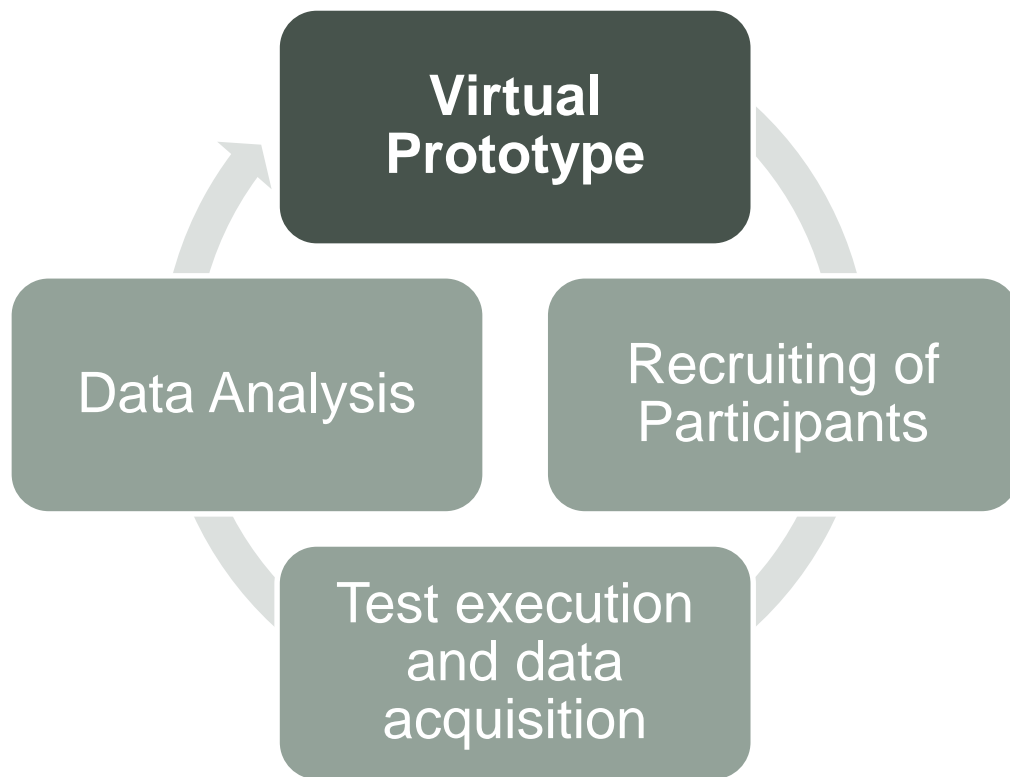


# My Research Area

- Usability evaluation of technical device prototypes



# Basic approach



# Vivian Framework

- Model virtual prototype
- Model statemachine(s) to define prototypes functionality
- Evaluate and record interaction
  - both AR and VR
- Analyse results

# Topics – AR Research

- Evaluate how to best introduce users to smartphone AR
  - Implement a simple smartphone AR using the Vivian Framework
  - Implement multiple types of introductions for the app that describe users how smartphone AR works
  - Evaluate, which introduction type helped the users best

# Topics – AR Research

- Evaluate how to react on wrong AR usage
  - Implement a simple smartphone AR using the Vivian Framework
  - Implement detection of inappropriate gestures
    - Pinch-zoom
    - Too far away
    - Double tap
  - Provide users with messages for solution
  - Evaluate, how users experience these messages

# Topics – AR/VR Research

- Moving and rotating objects
  - Implement a simple AR/VR using the Vivian Framework
  - Extend the techniques for grabbing, moving and releasing objects in multiple ways so that
    - The interaction is close enough
    - Objects do not get lost
    - Objects do not get stuck in each other
  - Test which one works best



# Topics – AR/VR Research

- Visualizing feedback out of sight
  - Implement a simple AR/VR using the Vivian Framework
  - Extend the Framework so that it visualizes feedback which is out of sight for the users
  - Test which type of visualization works best

# Topics – VR Research

- Provide a gaze pointer interaction for the Vivian Framework
  - Implement a simple VR using the Vivian Framework
  - Extend the Framework so that it allows for gaze pointer interaction
  - Evaluate the interaction using HTC Vive and Google Cardboard style VR

# Topics – VR Research

- Determine optimal prototype positioning in the Vivian Framework
  - Implement a simple VR using the Vivian Framework
  - Extend the Framework so that the virtual prototype is positioned in accordance to the user
  - Evaluate which positioning concept works best

# Tasks for upcoming week

- Literature Review
  - Do some research on your topics of interest
- Decide for and create a virtual prototype
  - Analyze a potential virtual prototype that can be used in your research
  - Start creating a virtual model of it (Vivian framework not required)
    - Can be done with Unity or with Blender
  - Consider which states the prototype has (at least for some functionality)

# Presentations next week

- Existing research
- Virtual Prototype
  - Functionality
  - Statemachine(s)
- 5 minutes presentation per person

# Questions???

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