

# Team Practical Course on AR and VR Research

## 00 – Organization

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# Research Group



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# Current Research Topics



Interested in these topics?

Contact us for:

- students projects and
- B.Sc., M.Sc. or Ph.D. theses

- Quality Assurance (QA)
  - Test Languages (TTCN-3, TDL, UTP)
  - Defect Prediction
  - Managed Software Evolution
  - Usage-based Testing
  - Usability Engineering (websites, AR, MR, VR)
- QA for Cloud Systems
  - Automation in Cloud deployments
- Simulation applications
  - Simulation of software development processes
  - Simulations of and in the Cloud

# The Course

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# Introduction

- Practical course
- Teams work on a research project in the context of AR/VR
- 4 – 6 participants per team
- In each project, an AR/VR will be developed

# Learning outcome

- Execute a research project
- Apply software engineering techniques
- Apply usability engineering techniques
- Apply user experience design
- Work in teams
- Fulfil development roles

# Why is this important?

- Experience in research project
- Experience in practical computer science
- Experience in lab projects
- Experience in software development
- Experience in team work
- ...

**Important for any of your  
future employments**

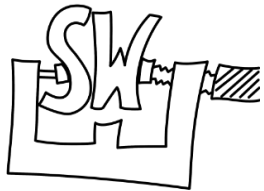
# My Expectations

- Self dependent learning
- Engagement
- Team work
- Continuous progress
- I also want to learn something!

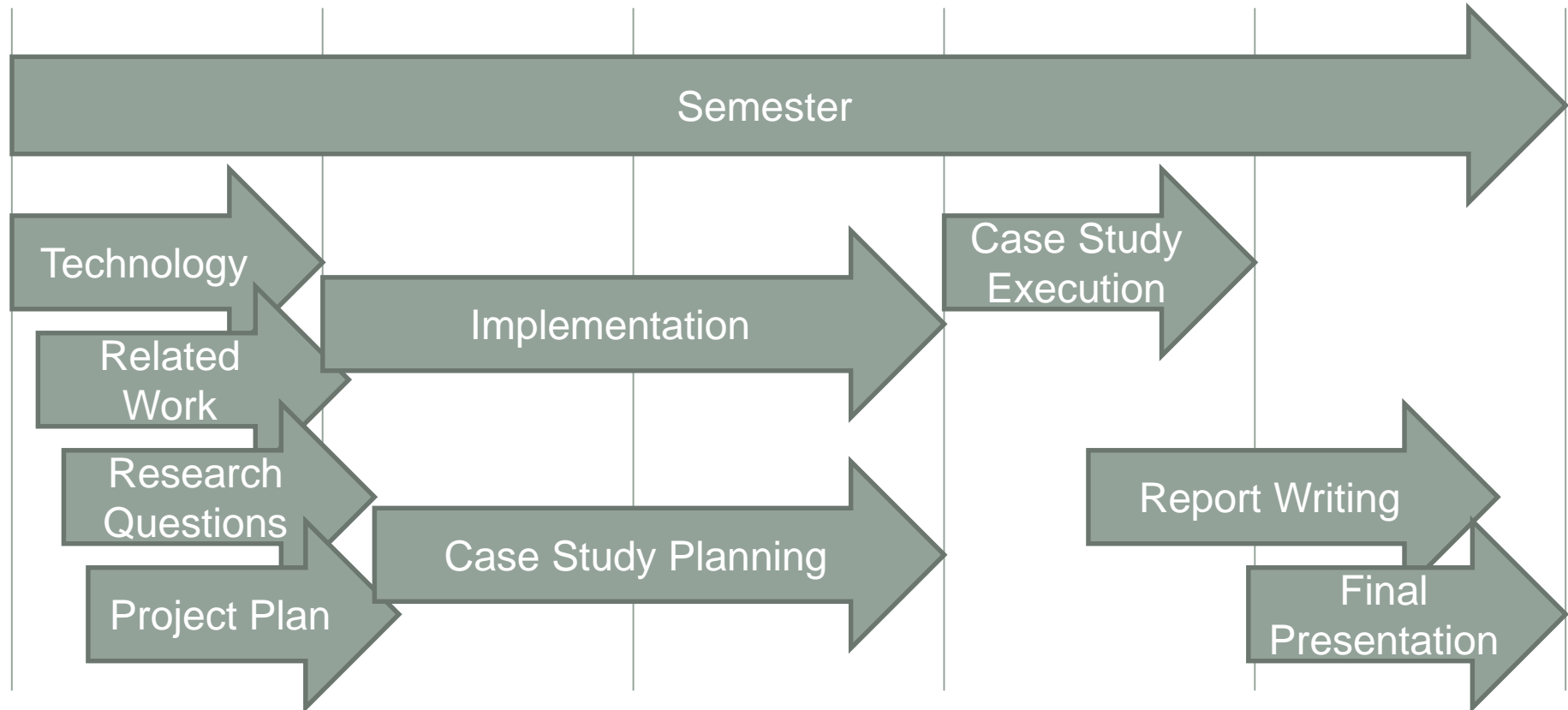


## Basic Course Structure

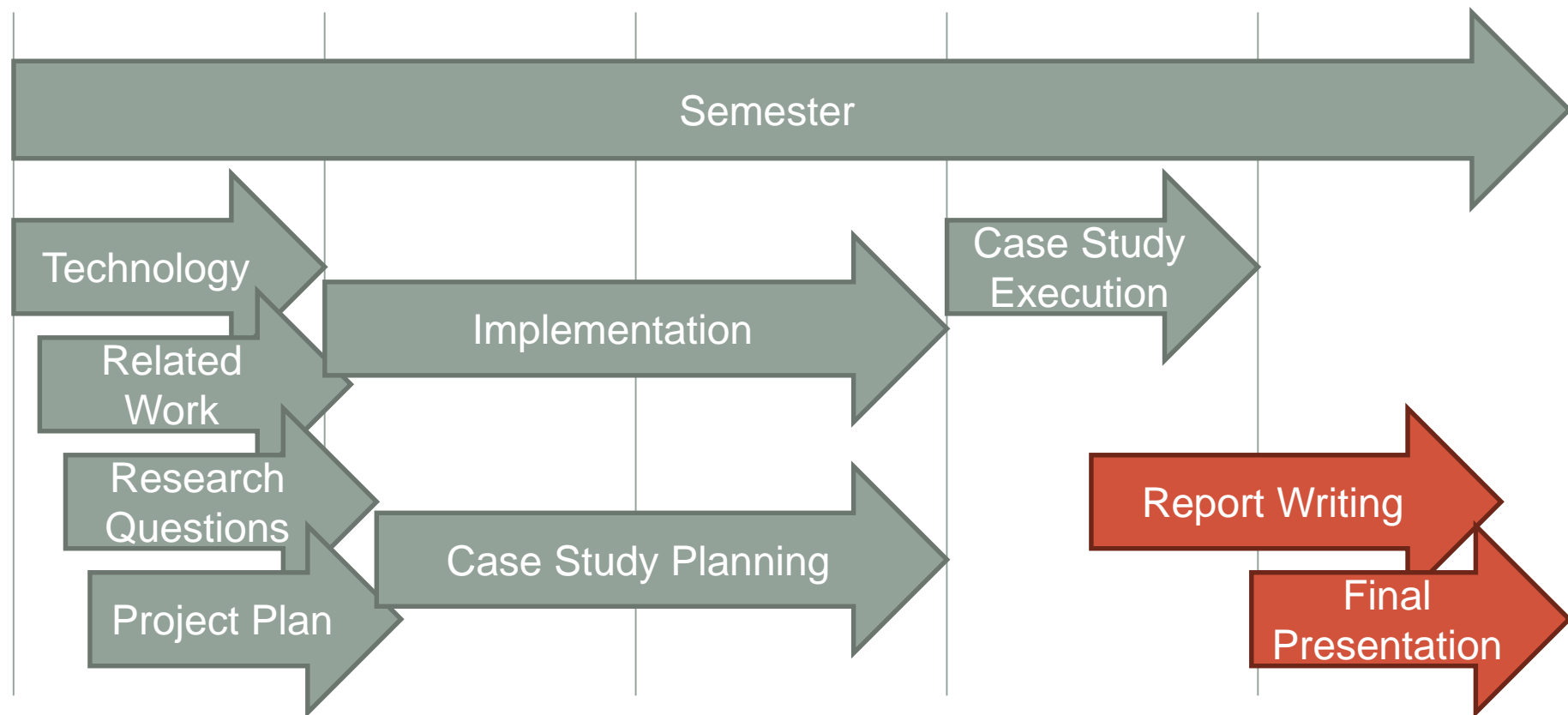
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# Basic Course Structure

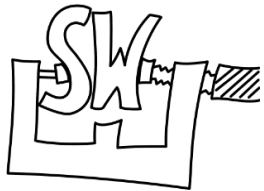


# Basic Course Structure



## Administrative Preamble

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# Administrative Preamble

- ECTS: 10 - 12
- Room: 0.101  
(Container)
- Language: English
- Time:
  - Mondays
  - 10:15 am to 11:45 am
- Modules:
  - M.Inf.1201
  - M.Inf.1202
  - M.Inf.1206
  - M.Inf.1208
  - M.Inf.1209
  - M.Inf.1259
  - **M.Inf.1823**
  - M.Inf.1909

# Administrative Preamble – Appointments

- Today until March
- Weekly sessions
  - Group presentations
  - Technology presentations
  - Theory presentations
- Occasional Hackathons
- No sessions on
  - 23.12.2019 (Christmas)
  - 30.12.2019 (New Year)
- Final group presentation  
**Mid/End of March**

# Administrative Preamble – Grade Criteria

- No grades
- Passing Criteria
  - Two weekly group presentations
  - Active part in final project presentation
  - Significant contribution to final project report
- Failing is also possible
  - Uninformed absence at scheduled presentation slot
  - Refrain from team work
  - Too few results
  - ...

# Administrative Preamble – Grade Criteria

- 10 to 12 ECTS, i.e., 300 to 360 working hours per student
- 1,200 to 2,160 working hours per group
  - About 1 year of full time employment
- diverse expectations towards
  - the outcome of the projects
  - reachable project goals
  - contributions of each individual group member



# Administrative Preamble

- Register in Stud.IP!
  - Share slides/other documents

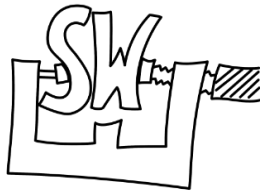
# Administrative Preamble

- Register for the exam via FlexNow latest until

November 4<sup>th</sup>, 2019

## Course Organization

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# Weekly Sessions

- You present requested content
  - The current project status (progress, challenges, questions, ...)
  - An important technology
  - Details on a development step
  - ...
- I may present brief introductions to
  - A topic in software engineering
  - A topic in usability engineering
  - A technology
  - ...

# Your Presentations

- 15 minutes
- At most 15 slides
- Present what was requested
- Consider open questions that came up during the week
- Try out presentation!

# Weekly Sessions

- Discussions
  - Open issues
  - Clarifications
- Next steps
  - Tasks
  - Topics for self dependent learning
  - Responsibilities
  - Presentations to be prepared for upcoming week

# Between the Weekly Sessions

- Organize yourself
  - Further meetings?
  - Infrastructure (communication channels, version control, test environment, continuous integration, ...)
- Distribute roles and work
- Make progress on the project
- Prepare next weekly session

# Hackathons

- Planned during the semester
- One day of focusing on the project
- Continuous availability of supervisor



# Final Report

- Similar to Research Paper or Thesis
  - Introduction, Foundations, Related Work
  - Approach, Case Study
  - Summary and Outlook
- Every team member contributes
- Contains annex detailing individual contributions
- Between 30 to 50 pages

# Final Presentation

- Scheduled for the end of the semester
  - Attendance is mandatory for all students
- Presentation
  - 35 minutes + 10 minutes questions/discussion
  - Every group member needs to fill at least 5 minutes
  - Content similar to report (less details, e.g., no related work)

# Challenges and Issues

- Clarified upon request

Talk to me!

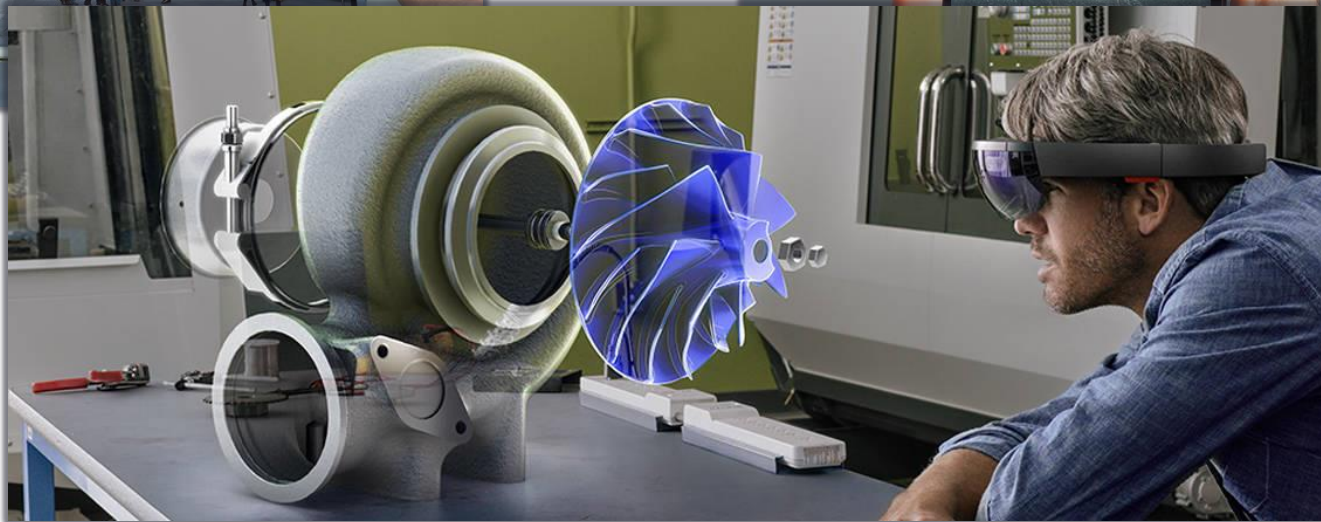
# Questions?

# What is AR and VR

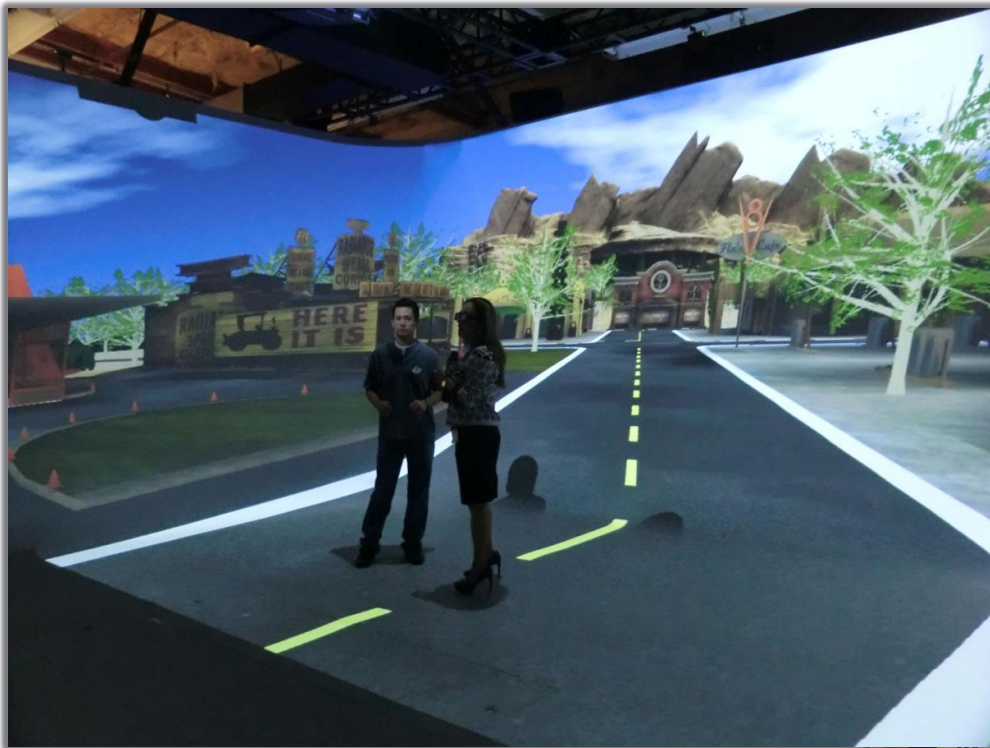
- What is virtual world?
- What is Augmented Reality (AR)?
- What is Virtual Reality (VR)?
- What is Mixed Reality (MR)?



# Examples for AR



# Examples for VR



# Hardware

- AR
  - One Samsung Galaxy S7 (currently in use)
  - Three Samsung Galaxy S8
  - Mobile phones (hopefully yours)
- VR
  - Two HTC Vives
  - One HTC Vive Pro
  - Mobile phones (hopefully yours)



# Tasks for upcoming week

- Learn about AR/VR
  - What is it? What is it not? What is Mixed Reality?
- Learn about Unity 3D
  - Download Unity 3D
  - Search for tutorials that best fits your needs
  - Play through diverse tutorials
- Learn about Unity for AR/VR
  - Check tutorials for ARCore
  - Check tutorials for HTC Vive

# Presentations next week

- What you learned
  - Definitions
  - Tutorials
  - Results
- 5 Minutes presentation per student
- Afterwards
  - Team building
  - Research topic selection

# Contact Information

- Patrick Harms                      [patrick.harms@informatik.uni-goettingen.de](mailto:patrick.harms@informatik.uni-goettingen.de)

# Questions???

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