Virtual Reality Game Development using a Rock Climbing Treadmill

SEMINAR KICKOFF

Who we are

Maximilian
Altmeyer

Florian
Daiber

Donald
Degraen

Felix
Kosmalla

Who are you?

Developing a VR Climbing Game

- ▶ Foundations of exergaming
- ▶ Combining VR and the physical world
- ▶ Deriving a game concept based on scientific work

4 Themes
1 per group

need to be integrated into the game

- ▶ Haptic Feedback
- ▶ VR Bystanders
- ▶ Exergames
- ▶ Perceptual Illusions

Haptic Feedback

While climbing in VR, users can physically grab the holds. This haptic feedback can make the experience more enjoyable and can make users feel like they are inside the virtual world.

The idea is to explore different methods of haptic feedback to enrich the experience or to provide more features.

Examples:
- Vibrations to the hands or feet to instruct the user
- Simulating top rope climbing
- Visual redirection or pseudo-haptic methods
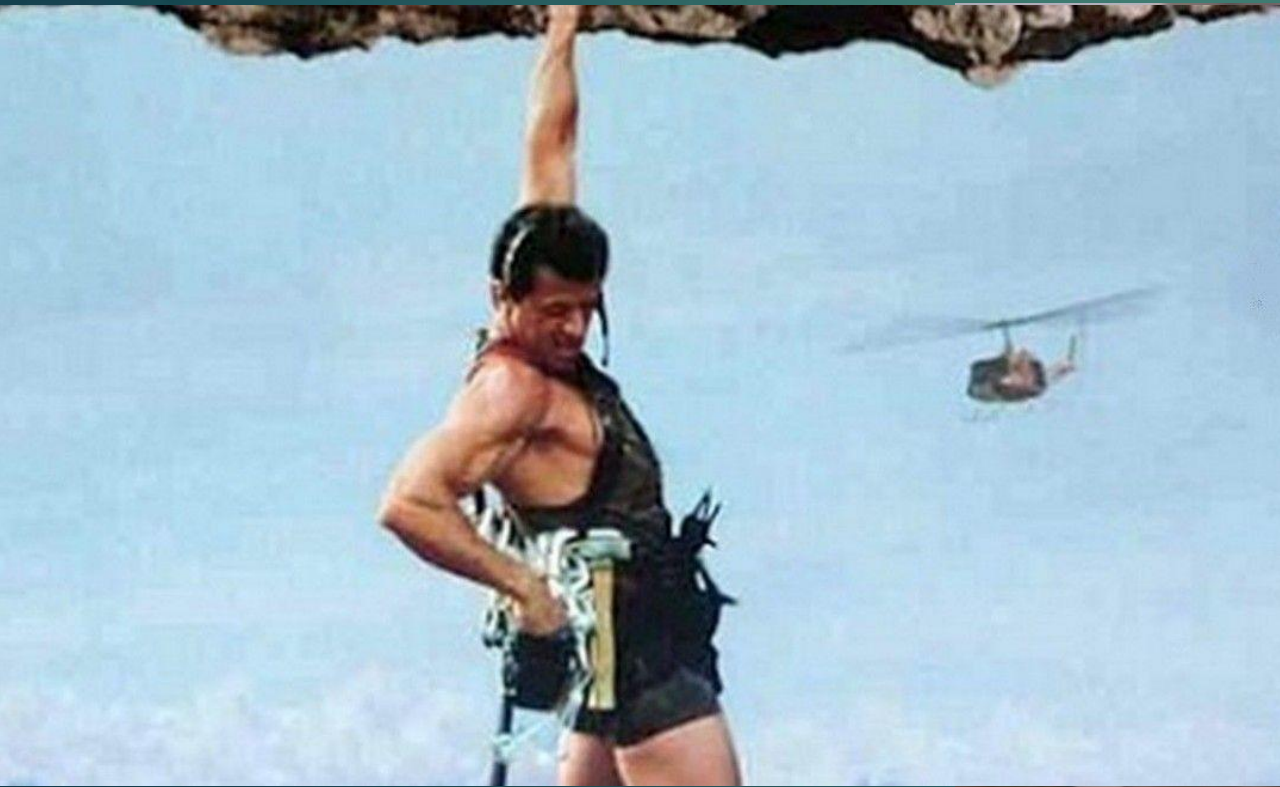- Simulating weather conditions, e.g., wind, heat, cold, or water

Donald Degraen

VR Bystanders

Design a multi-player game that enables co-located play and cooperation in VR or XR, i.e. include non-climbing players as opponents or to solve a common task.

Florian Daiber

Exergames

Design and implement a climbing game that motivates players to be physically active. The main focus should be enjoyment, i.e. the game should be fun to play and immerse players in the game world.

Maximilian Altmeyer

Perceptual Illusions

- Use the tilting function to..
  - visualize a strong overhang but tilt only a bit
  - simulate a falling rockface
  - …

Felix
Kosmalla

Vote for theme!

- Please state priority for all 4 themes

- Let us know if you want to work with specific people (groups of 3)

https://forms.gle/NbsTs7ZjoDbYBkYB7

Procedure

2 weeks

Introduction and Conceptualization

Also get to know the climbing wall

5 weeks

Progress Presentations

Mid-Term Presentations

5 weeks

Final Presentations

Introduction and Conceptualization
Presentation

e.g. scholar.google.com

REQUIREMENTS on **9 May 2022**

- Slides as PDF (by 9am)
- Oral presentation (10 min)
  - Papers
  - Draft of game oncept
- Concept in written form (EOD)
  - Overleaf Template

GRADING (10% overall)

- Quality of slides
- Insights of papers are recognizable in the presentation
- Use of allotted time
- Structure of talk is easy to follow

▶ Team searches for relevant papers
  ▶ Picks one per team member
▶ Papers should inform design of game concept
▶ Present the insights and draft of game concept

Introduction and Conceptualization **Document**

REQUIREMENTS on **23 May 2022 EOD**

- Final written concept as PDF

Talk to your advisor during the process!

GRADING (20% overall)

- Clarity of writing

- Insights of papers are recognizable in the presentation

- Feedback of prev. session is integrated

▶ Idea of Game

▶ Implementation timeline (including Milestones)

▶ Scope Statement

    ▶ Must-Have

    ▶ May-Haves

    ▶ Must-Not Haves

Will be used for grading

Progress Presentations

REQUIREMENTS

- Starting on 23 May 2022, weekly

- 3 min Presentation (can be a video, screenrecording, no polishing needed)

▶ What progress did you make during the week?

▶ How can we help?

Mid Term Presentations

REQUIREMENTS on **13 Jun 2022**

- Oral Presentation (10 min)
  - Should include video of MVP

GRADING (30% overall)

- MVP presented
- Quality of slides
- Mechaincs are clearly showcased
- Use of allotted time
- Structure of talk is easy to follow

▶ Minimum Viable Prototype
  ▶ showcase your main game mechanic
  ▶ climb and interact with the environment as described in concept

▶ Plan for the final 6 weeks

Presentation of Final Implementation

REQUIREMENTS on **18 July 2022**

- Oral Presentation

- Live Demo (if Corona permits, or Video)

▶ Show your game!

▶ Try out the other games!

GRADING (>=40% overall)

- Must-Haves

- May-Haves (Bonus Points)

- Code Quality (Documentation)

- Access to GitLab next week
  - Rough simulator replicating the physical setup
- Live Demo at DFKI

How to work on the system?

Procedure to try implementation

CONFORMING WITH COVID PRECUATIONS

1) Write an e-mail to felix.kosmalla@dfki.de with the desired day you want to be present
   (before noon the day before)

2) You are required to wear a FFP2 or surgical mask at all times

3) We meet at the main entrance –
   you sign up with your name and contact information
   2G+ status will be checked as well – tests can be done at DFKI from 8:30 to 12:00

4) Hygiene Measures
   1) Disinfection dispensers for hands and wetwipes are available at the climbing wall
   2) UV disinfection box for VR Headset is also available there (I'll show you how to use it)
   3) You need to air out the room every 20min
   4) Hands need to be disinfected before and after using the climbing wall
   5) Before leaving, standing table, mouse, keyboard, controller + glasses need to be disinfected

5) You sign out when leaving the building

What's next?

Vote your theme!

- By tomorrow night
- Please only vote if you really want to participate!

Do not forget to register in LSF!

Have a live demo

- Schedule an appointment with your advisor for the upcomming week

Get creative!

- Start working on your literature review and concept.

Open HiWi position

Unity Framework Development:

▶ Recording and Editing of Gestures

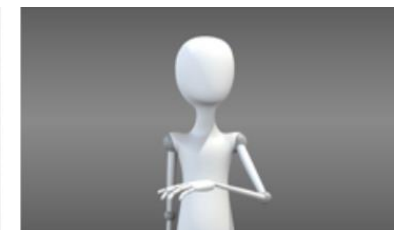▶ Playback in Virtual Reality

Requirements:

▶ Knowledge of Unity and C#

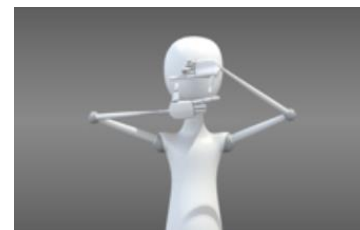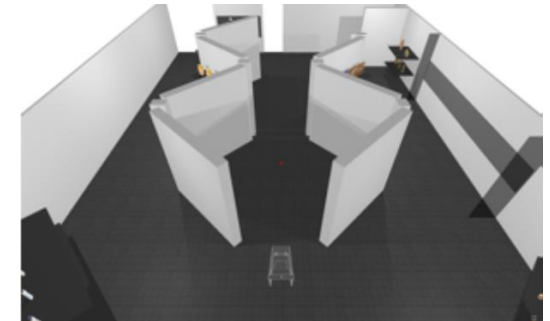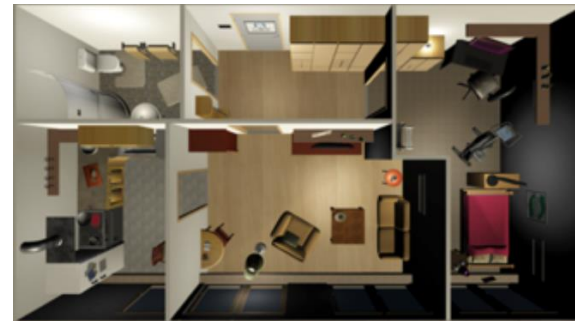Potential to combine with a Bachelor/Master thesis

For more info or to apply, send an email to:

donald.degraen@dfki.de

GrIPSs

SIC Saarland Informatics Campus

Gestural Interaction Paradigms for Smart Spaces

Open HiWi position

VR Development:

- Development of VR-3D User Interfaces for remote sensing and visulization of spatial sensor data

- Design interactions with multi-dimensional spatial data and interactive machine learning

Requirements:

- Good knowledge of software development in general and specifically in Python, C# and Unity or Unreal

Potential to combine with a Bachelor/Master thesis

For more info or to apply, send an email to:

florian.daiber@dfki.de

PORTAL

Plant breeding using robotics and AI for advanced data analysis and decision making in virtual space.