Fear Elicitation In Virtual Reality

Current State Of Affairs

- Virtual Reality has successfully treated phobias
- Creating fear responses in those without phobias has been less explored
- Analysing physiological data for signs of fear is time consuming

Project

- Create a virtual reality environment that generates a fear-response that is not phobia-related
- Create a visualization tool for physiological data
- Conduct evaluation study
- Clients are representatives from the psychology department

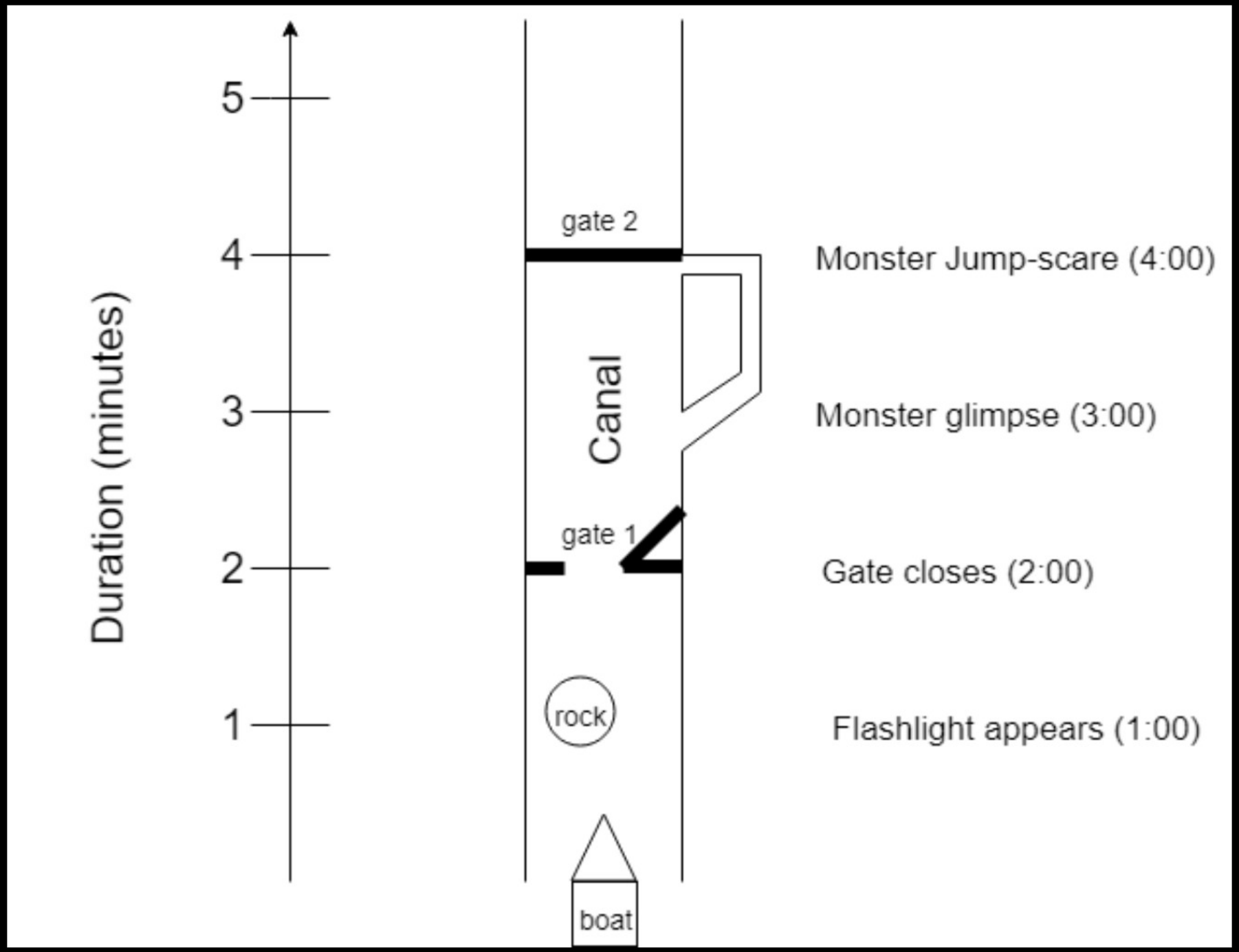
Problem Statement

- Research questions:
  - Can a virtual environment generate a fear-response that is not phobia-related?
  - Can we create a usable visualisation tool for physiological data analysis?
- Hypotheses:
  - The virtual environment will induce higher physiological arousal in participants compared to baseline
  - Participants will report a higher degree of fear after experiencing the virtual environment
  - The visualisation tool will have a high usability rating when evaluated with a usability questionnaire

The Story

- Dark underground canal
- Boat pushed along by water
- You might not be alone

Environment Design



Evaluation Study

- 15 - 25 participants
- Psychology department to provide equipment and guidance
- Baselines taken before experience
- Screen out phobias, PTSD, depression and alcohol misuse

Physiological Measures

- Heart rate
- Skin conductance
- Respiratory sinus arrhythmia

Self-report Questionnaires

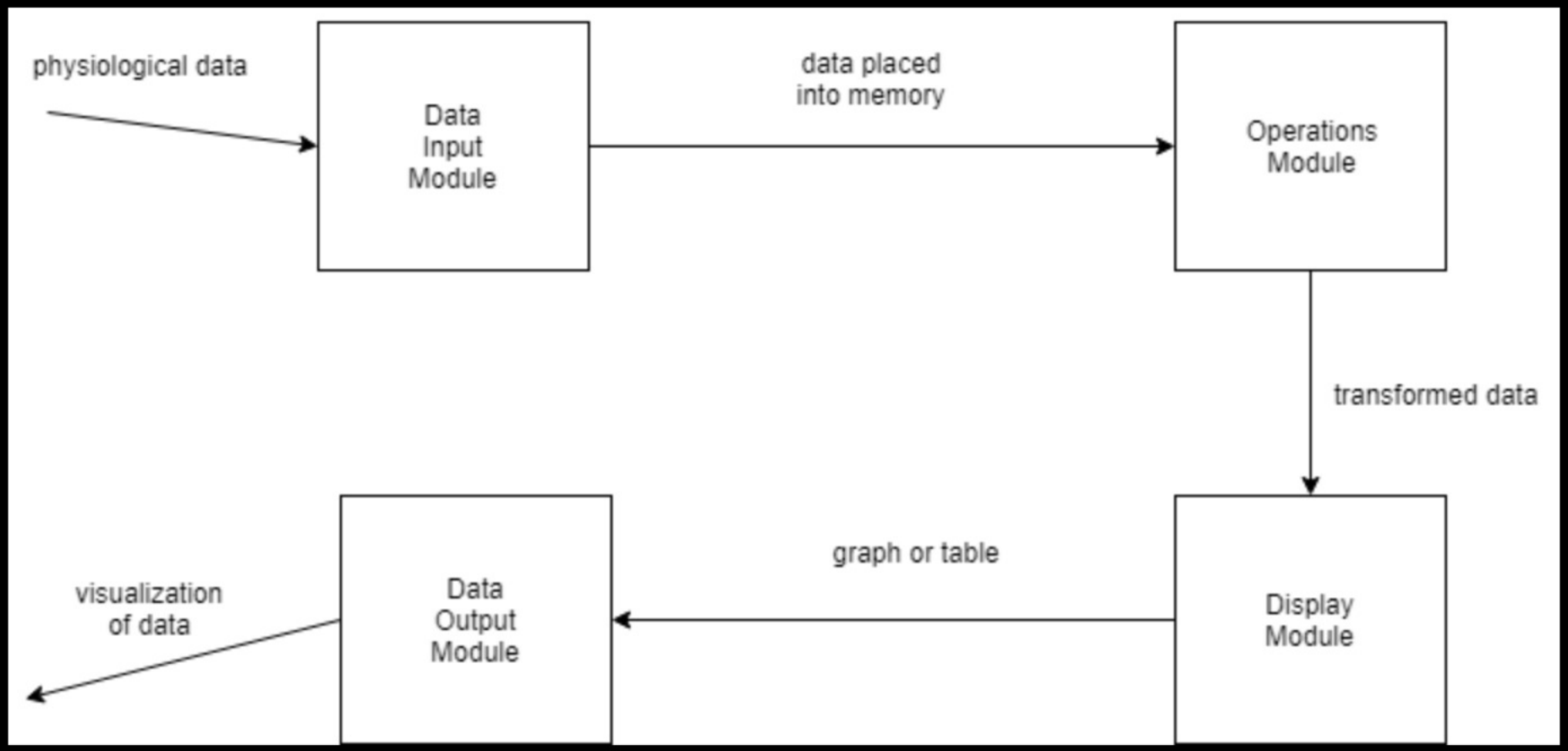
- Self Assessment Manikin
- Visual Analogue Scale
- Differential Emotions Scale

Ethics

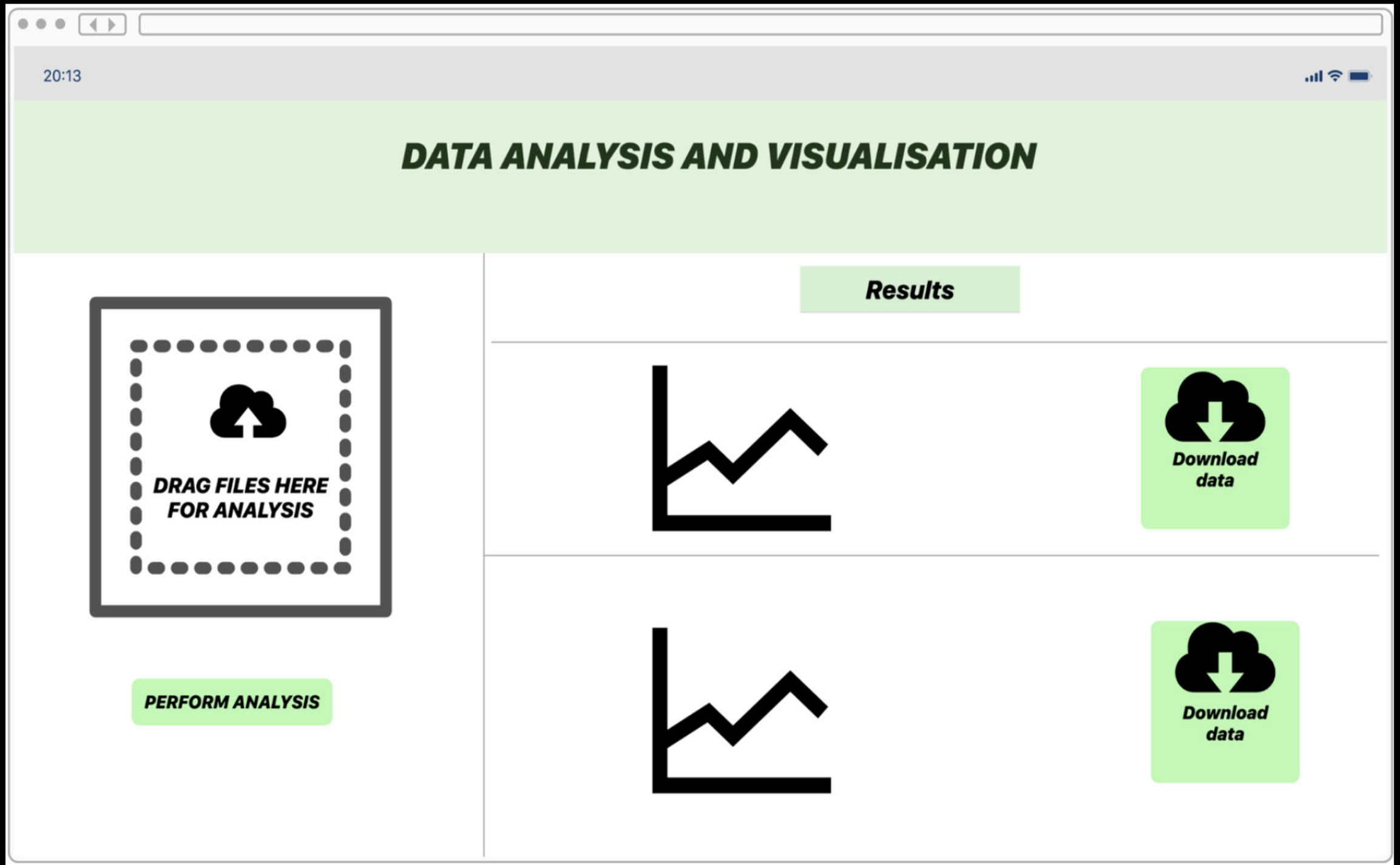
- ☑ Ethical clearance
- ☑ Voluntary participation
- ☑ Informed consent
- ☑ First aid on standby

Visualization Tool

- ▣ Read in data
- ▣ Data transformations
- ▣ Visualizing data
- ▣ Export data



GUI Design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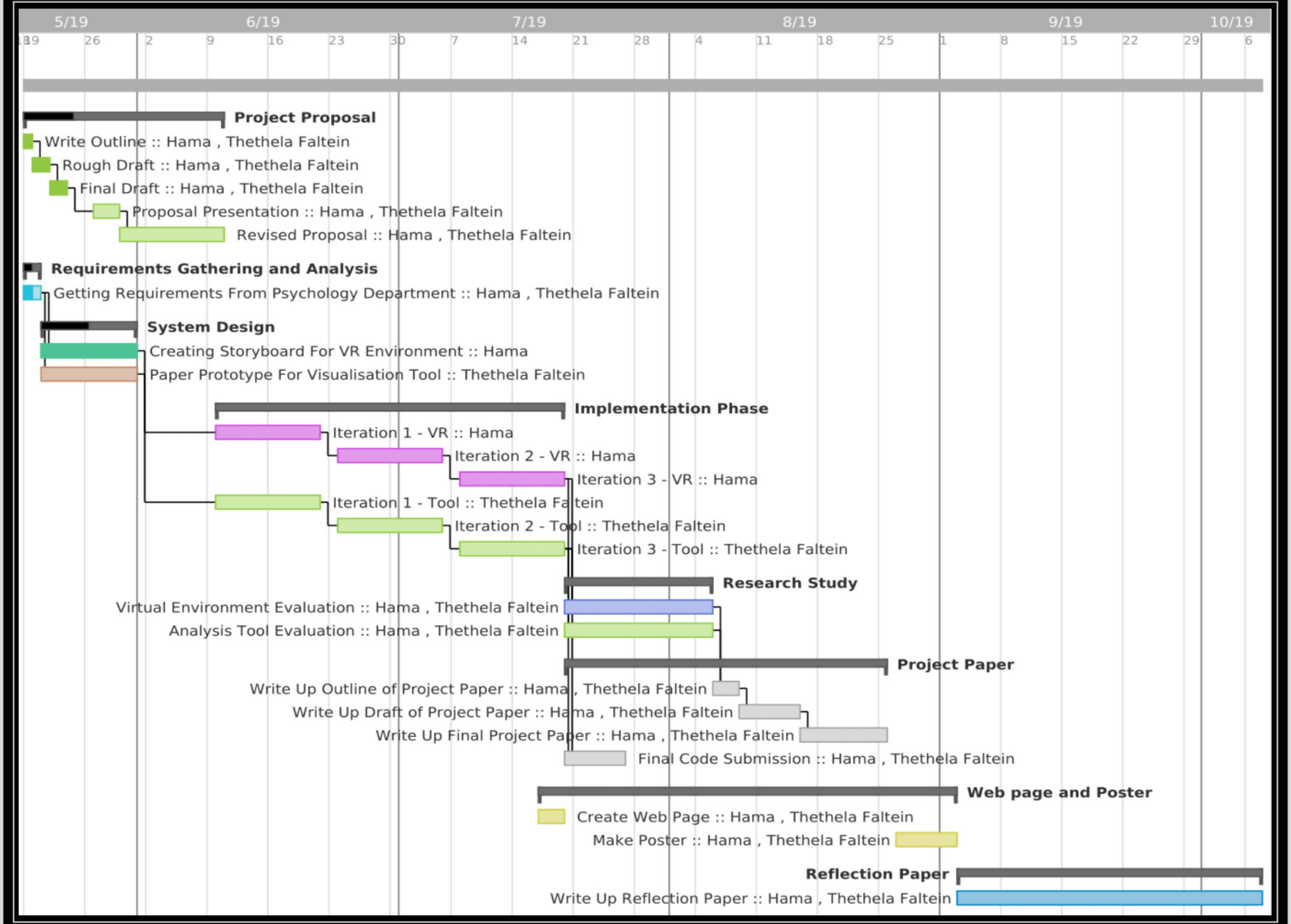
DATA ANALYSIS AND VISUALISATION
DRAG FILES HERE FOR ANALYSIS
PERFORM ANALYSIS
Results
Download data
Download data

User Centred Design

- For developing the virtual environment and analysis tool
- Weekly client meetings
- Any problems with be fixed early
- Three iterations in 6 weeks

Timeline

- ▣ Development: 10 June - 19 July (6 weeks)
- ▣ Evaluation study: 22 July - 7 August (2.5 weeks)
- ▣ Writing final paper: 8 August - 3 September (3 weeks)
  - ○ Outline: 10 August
  - ○ Draft: 17 August
  - ○ Final paper: 27 August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Project Proposal
Write Outline :: Hama , Thethela Faltein
Rough Draft :: Hama , Thethela Faltein
Final Draft :: Hama , Thethela Faltein
Proposal Presentation :: Hama , Thethela Faltein
Revised Proposal :: Hama , Thethela Faltein
Requirements Gathering and Analysis
Getting Requirements From Psychology Department :: Hama , Thethela Faltein
System Design
Creating Storyboard For VR Environment :: Hama
Paper Prototype For Visualisation Tool :: Thethela Faltein
Implementation Phase
Iteration 1 - VR :: Hama
Iteration 2 - VR :: Hama
Iteration 3 - VR :: Hama
Iteration 1 - Tool :: Thethela Faltein
Iteration 2 - Tool :: Thethela Faltein
Iteration 3 - Tool :: Thethela Faltein
Research Study
Virtual Environment Evaluation :: Hama , Thethela Faltein
Analysis Tool Evaluation :: Hama , Thethela Faltein
Project Paper
Write Up Outline of Project Paper :: Hama , Thethela Faltein
Write Up Draft of Project Paper :: Hama , Thethela Faltein
Write Up Final Project Paper :: Hama , Thethela Faltein
Final Code Submission :: Hama , Thethela Faltein
Web page and Poster
Create Web Page :: Hama , Thethela Faltein
Make Poster :: Hama , Thethela Faltein
Reflection Paper
Write Up Reflection Paper :: Hama , Thethela Faltein

Required Resources and Deliverables

Resources

- ☑ Oculus Rift VR
- ☑ High-end desktop PC
- ☑ Unity assets
- ☑ Physiological equipment
- ☑ Physiological data

Deliverables

- ☑ VR environment
- ☑ Visualization tool
- ☑ Final paper
- ☑ Project poster
- ☑ Project webpage
- ☑ Reflection papers

Risks and Risk Management

Risk	Likelihood	Consequence	Mitigation	Monitoring	Management
Not enough participants	3	Not enough data to conclude	Assistance of psychology department	Check on participants day before	Ask friends and classmates to participate
Scope creep	3	Unfinished deliverables	Build core functionality first	Compare progress with timeline	Reduce project scope
Incomplete testing	6	Bugs showing up during user experiments	User Centred Design, through testing	Code coverage of unit tests and integration	Will have to settle for playtesting only
Unclear requirements	5	Final product does not satisfy client	Discuss with clients before coding	Continuously get feedback from clients	Build core functionality first

Work Allocation

- Hama will work on the virtual environment
- Thethela will work on the visualisation tool
- Evaluation of the fear environment and visualisation tool will be done conjunctly

Thanks?

Questions!