

# Individual portfolio

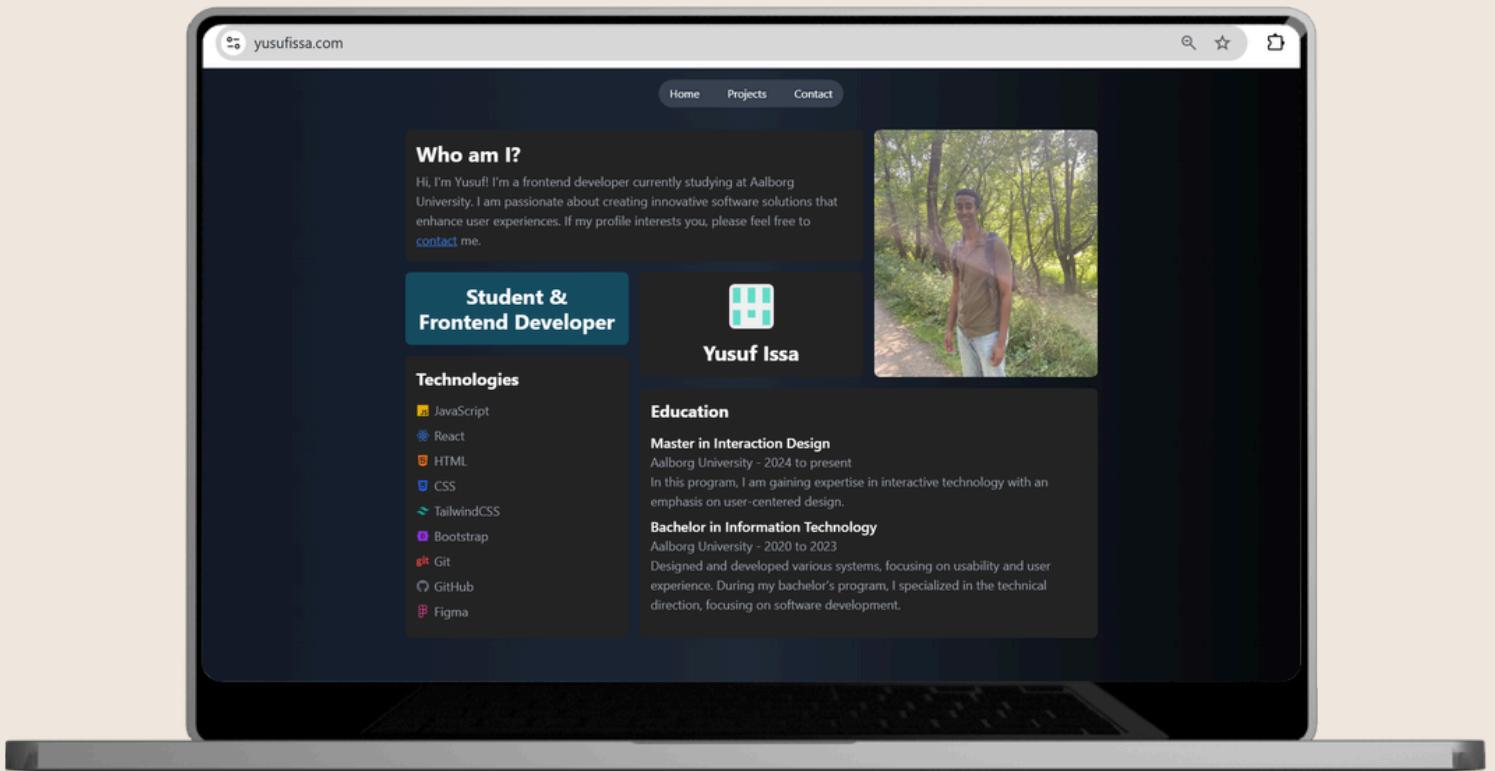
Yusuf I. Ahmed

Department of Computer Science,  
Aalborg University, Danmark

Yahmed20@student.aau.dk

Online Portfolio:

<https://yusufissa.com/#/projects>





# Introduction

This semester, we completed three projects in a sprint-based approach. The first two were smaller projects, each taking 3 and 4 weeks to finish, while the final project took around 7 weeks. This approach helped me get to know my fellow students and work with almost everyone, as groups changed with each project. Furthermore, I got to work on completely different projects, which exposed me to different tools and approaches I did not know prior.

The first project we worked on was "Explore Aalborg", which is a way to motivate people to explore different places, by giving them points that they can use. The second project was "Global Funstop", which aimed to give travelers a fun experience while waiting for their plane. Lastly, our main project was a simulation system designed to better equip caretakers in psychiatric wards to handle violent conflicts.

# Project 1

## Explore Aalborg

The constraints during the first project were Urban scale and AI, which forced us to gather information about what could be feasible in the urban scale. Therefore, we started by doing a brainstorm about the constraints, to see what kind of ideas we could work with. We used a method called "Dumb Ideas", where we freely listed every possible idea that came to mind when considering the constraints of urban scale and AI. This method is a very open-minded approach, where no idea is outright dismissed but rather used to generate a diverse pool of different concepts you could work with. After this mapping of the different topics, the group voted for the best idea.

The first topic we worked on was an AR-based interactive movie poster with body recognition to encourage people to visit movie theaters. To assess whether this was a real problem, we conducted a headcount in front of a cinema, observing how many people stopped and looked at movie posters. However, after reflecting on the findings and discussing the project further as a group, we concluded that this idea was not feasible. As a result, we revisited our brainstorming session and, after several days of consideration, voted to pursue a different concept.

The concept involves a gamified app that encourages users to discover new places and hidden gems around Aalborg. The app features an interactive map that displays various locations, allowing users to earn points as they visit them. Our problem statement was: "How do we make it easier for people living in Aalborg to explore

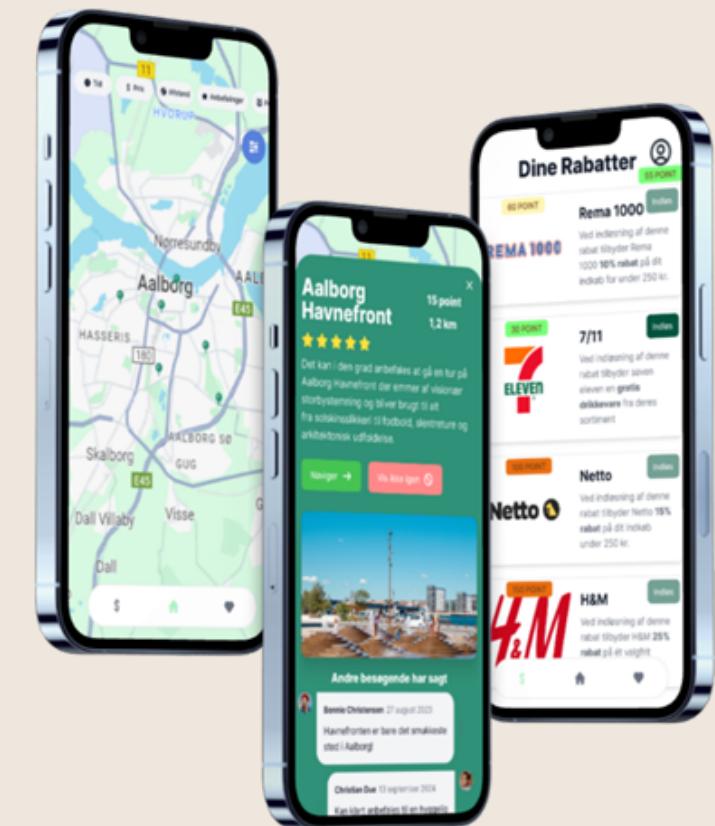
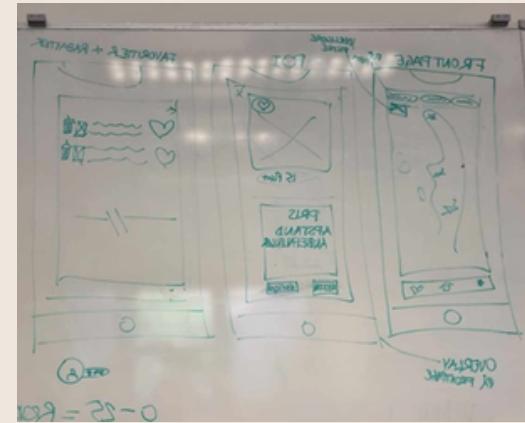
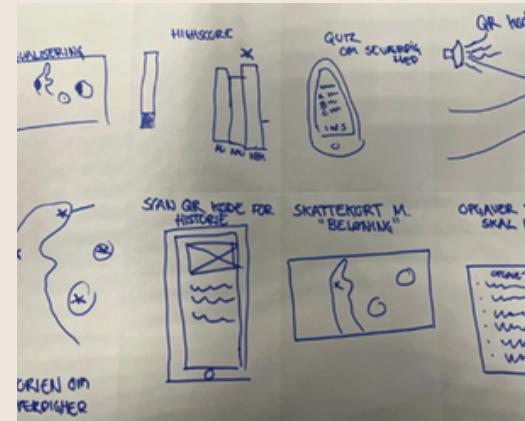
relevant experiences and events?" Using this as a foundation, we performed a traditional Crazy 8 exercise with pen and paper to sketch the initial version of the app. Additionally, we conducted five interviews and a survey to understand user needs and gather insights on the features they would find valuable. This helped us make a prioritized MoSCoW list, of what features were a must-have and which could be future work. Our solution to the problem statement ended up being a design for a system where you earn points by exploring different places and can see what others think about them as well. These points can then be used for discounts at various local places, which was important for some of the people we interviewed.

# Project 1 reflection

During this first project, we faced a challenge early on, since we had to abandon our first idea about AR-based interactive film posters. This cost us some time, but it provided me with some learning experience. The decision to pivot to a new idea was the correct one since we were able to create a more viable concept in my opinion.

This project group came from a mix of interaction-design students and people from other backgrounds like me, which allowed us to explore different approaches.

We created an early wireframe on the whiteboard to map out key functionalities before moving on to a more detailed and thorough wireframe in Figma. This approach helped us align our ideas as a group while designing this system together. I enjoyed working on this project since it was a field I already had prior experience in. Having this prior experience is beneficial since it allowed me to contribute more to the different work sessions our group did.



# Project 2

## Global funstop

The constraints during the second mini-project were room scale and AI. We began brainstorming within these constraints, mapping out technologies we could think of related to AI and identifying spaces that could work within room scale. This approach helped us visualize the different combinations we could create by considering various technologies and room-scale spaces.

During this session, the group became interested in the concept of waiting time in public spaces, so we started to use the ideation games tiles inventor toolkit. We used this ideation game to provide some sort of structure to our brainstorming session. During this ideation game, we found out that we wanted to make a solution to fix the long waiting time at the airport, by creating a fun attention-grabbing experience.

The idea became a concept that helps users learn about their destination through a tangible table, where users can combine different categories and the AI generates unique quizzes. When we had a general idea of the product, we used the crazy 8 method to generate ideas for different features of the system.

We also did a collaborative sketching session for about 20 minutes, where we discussed ideas together and created a finalized sketch. After this, we began developing our prototype in Figma. To validate our design, we

conducted user tests using two different methods: a moderated test and an unmoderated think-aloud test. The moderated test had a facilitator guiding the user through the prototype and could help with clarifying questions, whereas the unmoderated was used to see if the prototype was intuitive enough to interact with it independently.

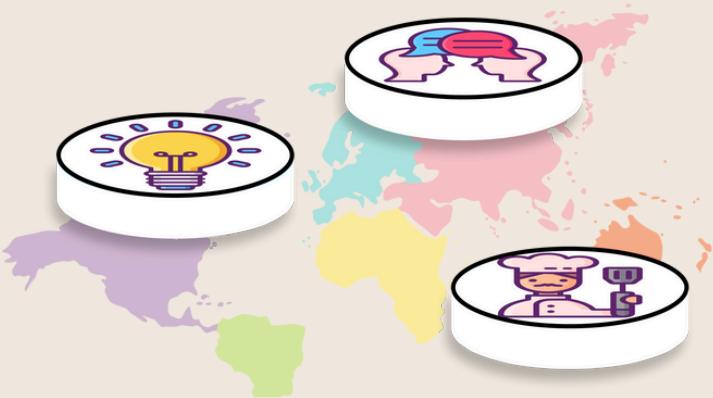
We made some scenario-based tasks where participants imagined experiencing a flight delay and then explored the tangible table, either alone or in groups.



# Project 2 reflection

I found this project both challenging and rewarding, as it introduced me to the concept of tangible tabletops, an area I had no prior experience in. Having never interacted with or designed for such interfaces before, I had to research how these tables work and what other systems have been developed for them. Additionally, designing physical components to control the tangible table was an exciting aspect of the project, as I believed it would enhance the user experience compared to the traditional touchpad.

One of the main reasons we decided to work on the tangible table top, was the group shared inexperienced with this technology. We wanted to explore something entirely new, but also something relevant so we could gain some good experience. This consideration guided our brainstorming sessions, since we always had in mind which setting these tangible tables could be implemented in.



# Project 3

## AI Simulation trainer for psychiatric wards

The last project had fewer constraints compared to the previous two, where urban scale and room scale were key limitations. So, we began with a brainstorming session, where we used an inspiration card workshop to combine technology cards with various subjects. One of the ideas we considered first was an AI fitness trainer designed for public spaces to help people make better use of free public exercise equipment. To evaluate its potential, we conducted a test-walk by trying out the equipment ourselves. However, based on this experience, we concluded that developing an AI trainer for this purpose would not be a good idea, since the equipment was bad. We brainstormed some more and the concept of a simulation became interesting, and our group decided to find a suitable subject to combine it with. This led to a new brainstorming session focused on simulation,

where we combined various subjects to discover the best idea. We came up with a lot of great ideas, but we had to narrow it down by voting for the best ones. That's how the chosen topic became Violent conflicts in Psychiatric Wards, specifically targeting caretaker safety. After selecting this topic, our group conducted thorough research, reviewing numerous papers on the subject. Our findings confirmed that violent conflicts in psychiatric wards are a significant issue. We sent an email to every psychiatric ward across various municipalities in Denmark and received a brief written response from a psychiatric ward in Copenhagen, pointing us to some relevant literature. Following this, we created an interview guide to carry out semi-structured interviews with caretakers experienced in the psychiatric field.

Our prototype, named 'De-Sim,' evolved into a simulation trainer where the AI acts as the patient. This is built using the Unity Engine, the scripts are written in C# and incorporate the Whisper API to transcribe user input. The transcribed user input is sent to OpenAI's GPT4- mini API, which we have instructed to act like a schizophrenic patient through some prompts. The caretaker is presented with a scenario involving a case, and they must use various communication techniques to calm the AI patient. The simulation only ends when the caretaker successfully meets the requirement of calming the patient and is satisfied with the outcome. We conducted a usability evaluation of the simulation, not to assess the system's design, but to determine if the scenarios were realistic. This was crucial, as our participants came from the psychiatric field, and their feedback provided valuable insights.

# Project 3 reflection

During this project, it was challenging to find participants for our research due to the busy nature of the psychiatric field. Out of the five regions in Denmark, only two responded to our inquiries, and only one was willing to participate in our interviews. I thought working on this topic was great since it was something with a meaningful purpose. Furthermore, even one of our more experienced participants in the usability evaluation saw the potential and wanted us to send him the final product to forward to his superiors.

One major challenge during this project was the 7-week time limit, which forced us to rush some processes we normally would use more time on. For example, we had to conduct interviews in a short timeframe, which could have limited the in-depth information we could get. On the other hand, finishing our research period allowed us to implement the newly acquired information into our final product.



**Deescalation**

"We often find that if there is violence or unrest in the ward, we spend a lot of energy trying to calm the ward again, to avoid new conflicts arising with the other patients"

"No matter how sick they are, no matter what thoughts, opinions, and feelings they may have, you have to respect them as they are and listen to them, very important"

"Keep yourself calm and listen to what they have to say and acknowledge what they say. They may say they hear voices, see UFOs, see cameras in the ceiling and poisoned air. Acknowledge that it is okay that they have these thoughts, feelings and visions, but it is not anything you experience. You need to be honest to me, it is not something I experience. But I recognize that you experience it. Because in their world, it is real. (...)"

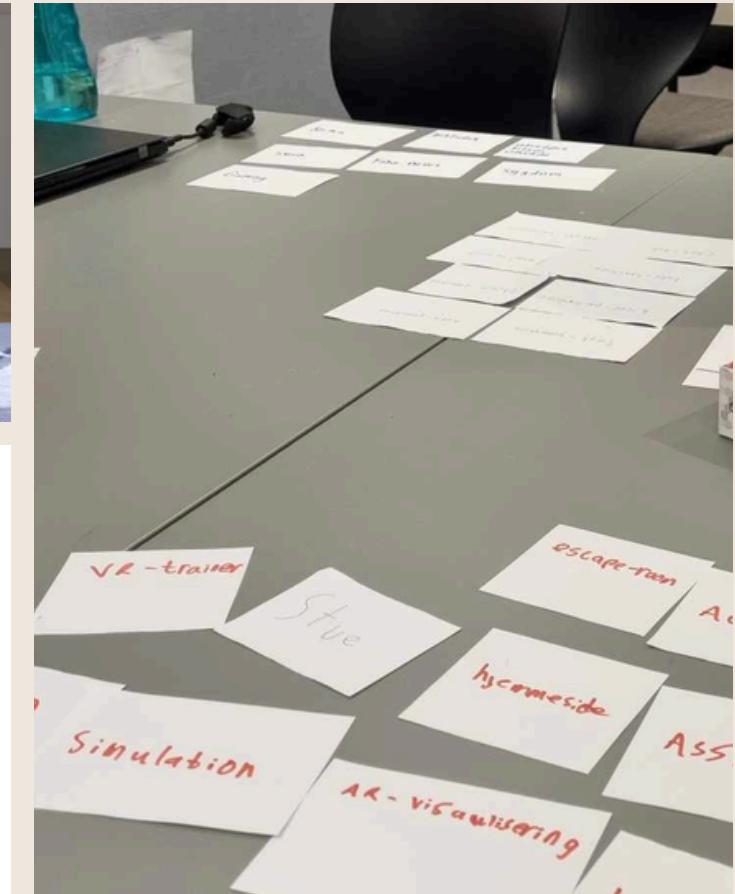
**Training**

"The new and inexperienced colleagues"

"It is limited, almost none of them get conflict management, it is not part of the education"

"They do not have the experience that we gain after many years and you cannot act the same way as you would on the street then you would not get far. You need to be able to take a lot of scolding, you need to be able to take a lot of name calling."

"Yes, it is about supervisor to supervisor what you educate them in when they end up in the psychiatric. It is limited. It is almost none of them that train conflict resolution. It is not a part of the education."



# Overall reflection

This semester's setup was pretty good, with two mini-projects and one bigger one, giving us a chance to work on three completely different topics. As a new student in the master's program, I liked it because it meant I got to work with almost everyone in my class. It was a great way to get to know people and build connections while working on different topics. I also thought the design critique sessions at the end of each project were a great addition. It was awesome to see all the interesting things others had been working on and could inspire some of my thinking in the next projects.