

UPPSALA UNIVERSITET

Department of Media and Informatics
Human-Computer Interaction

Project Report

DESIGNING A PROTOTYPE FOR AN AI-CENTERED APP THAT ENGAGES EMOTIONALLY WITH HUMANS

Group 10

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1 Introduction

1.1 Literature review

This study explores emotional engagement between humans and artificial intelligence (AI) systems. To delve into emotional interaction, we will review key foundation works in this field. One of the key components, emotion AI, is a subset of artificial intelligence that focuses on measuring, understanding, simulating, and responding to human emotions. The origins of this field date back to 1995, when MIT Media Lab professor Rosalind Picard published her seminal work *Affective Computing* (1997). Emotion AI has significantly changed and transformed current society.

As technology becomes more adept at mimicking human emotions and individual preferences, new ways of evaluating relationships with technology arise. People may start to trust and rely on technology in ways that were previously reserved for human relationships (Friedrich et al., 2022). To make AI-human interaction more emotionally engaging, humans' trust in AI interactions should be strengthened (Lohani et al., 2016). Trust is one of the known contributing factors in research fields such as human-automation interaction, to form self-confidence while controlling automation manually and voice interaction to evaluate the relationship development between human and voice assistants (Desai et al., 2013; Seymour & Van Kleek, 2021). Inspired by the theory from the organization field, trust can be further broken down into cognitive and affective trust. Affective trust is emotion-based, emphasizing the emotional comfort and security a user feels while interacting with the system (Madsen & Gregor, 2000).

By including socioemotional elements such as emotionally expressive dialogues during human-robot interaction, not only trust but also the subject's stress coping mechanisms are empowered (Friedrich et al., 2022). Artificial intelligence has unlocked new opportunities for product development and has become an efficient tool for collecting feedback, analyzing large amounts of unstructured data by using natural language processing (NLP) and learning from it through prior correlations (Bhowmick & Seetharaman, 2024). Integration and population of AI in devices and systems, or simply wearable Internet of things (IoT), has changed the way humans interact with technology, and monitor health and become an everyday use tool (Knickerbocker et al, 2018).

As AI aims to emulate human cognitive functions, it brings a different perspective to the emotional awareness approach by applying it not only as a tool but as a companion too. Conventional AI techniques encompass machine learning approaches for structured data, including traditional methods like neural networks, as well as contemporary deep

learning and NLP. Even though AI cannot replace human-to-human interaction, it fosters emotional engagement with the users by simulating human-like interaction, responses, and empathy. One way AI simulates this type of interaction is through natural language processing models, such as large language models, which facilitate a conversation between the user and AI while personalizing the interaction depending on the context that was created. These types of features create an illusion of real conversation, making users feel more emotionally connected and heard by the technology without the human judgment that might arise in a real conversation (Churchill and Wiberg, 2024).

AI's capacity to foster emotional bonds can sometimes be limited by the user and the user's trust. Even though the technology should facilitate a human-like conversation, sometimes users have to be too specific in their conversation in order to get the expected response from the AI. This challenge of AI understanding the context humanly makes some of the users think twice before engaging in a conversation and it makes them see it more as a tool than a companion (Ma et al., 2024). Another challenge is when AI outperforms humans, people tend to feel inferior and experience less agency. This leads to the development of a less positive attitude towards the AI system (Schaap et al., 2024). Furthermore, trust is crucial because users feel that AI assistants act to their benefit, facilitating tasks that would require more time on their own. AI that engages in human-centered dialogues can ask clarifying questions, creating an environment where the context is clearer and the responsive interaction leads to a more genuine and emotional engagement between the user and the AI (Manzini et al., 2024).

Existing research suggests that multimodal machine learning (MML) is a technique that integrates multiple data sources—such as text, vision, and audio—allowing AI to interpret and respond to emotions more comprehensively (Liang P. P. et al., 2024). This technique can help with emotional engagement, as human emotions are expressed through multiple channels simultaneously. MML enables AI systems to process and combine these modalities, which can be used to detect complex emotional cues, such as sarcasm or humor.

Users may perceive AI as a companion or support system, fulfilling unmet emotional needs. Both Anthropomorphism and Authenticity are significant factors that influence AI social interactions (De Freitas et al., 2024; Pentina et al., 2023). When users perceive AI as more human-like (anthropomorphism) or authentic, they are more likely to engage in social interactions with it (Pentina et al., 2023). Anthropomorphism, the attribution of human characteristics to AI, plays a pivotal role in how users emotionally connect with these systems (Pentina et al., 2023). By giving AI human-like traits, users can develop emotional attachments similar to those formed with humans (De Freitas et al., 2024). This attachment is further fostered through repeated, meaningful interactions that simulate friendship, support, and empathy (De Freitas et al., 2024).

Furthermore, with this research as a background, we aim to contribute to the understanding of human and AI emotional engagement. Therefore, the study outlines the current limitations in the area, and our suggestion of bringing an “AI Buddy” might open up new possibilities for future research.

2 User Study

2.1 Introduction to User Study

Artificial intelligence (AI) engagement and emotional requirements are the two main topics of our study. This helps define the target user group for our research: individuals who are open to AI technology; and those who are more likely to face emotional challenges.

A literature review based on 40 qualitative studies demonstrates the multifaceted nature of college students’ stressors that cause emotional fluctuations. These stressors cover a broad range across eight major categories: relationships, lack of resources, expectations, academics, environment, diversity, and transitions. They operate across three levels of social context: individual, dyadic, and group (McCleese, Baranik, & Daniel, 2012). In the meantime, these stressors might be particular to this group, happening during and associated with particular stages of the student life. For example, research indicates that before or at the start of an exam, students are more likely to experience negative emotions like anger and anxiety. The positive emotions of students climbed during the exam and peaked after. These emotional changes might trigger stress responses, directly affecting the biological system, which could impact the exam performance (Spangler G. et al., 2002).

The job search period is another phase where students face significant emotional fluctuations and challenges. During the transition from school to the labor market, students’ emotions are highly influenced by both directions, causing them to experience a range of emotions. These feelings, which include pride, anger, and jealousy, have the power to inspire or demotivate people, which can speed up or slow down the job search process (Kim & Lee, 2021).

A study shows that Gen Z, born between the mid-1990s and early 2010s, is more likely to view AI as a tool for enhancing everyday life (Chan & Lee, 2023). Having grown up surrounded by digital technology, they are more at ease and knowledgeable about new technologies than earlier generations, being digital natives of this technologically advanced period. Furthermore, studies on Gen Z’s adoption of AI virtual assistants for mental assistance indicate that they are more receptive to this possible usage of AI (Alanzi et al., 2023). Moreover, the increased use of digital and social media has a profound impact

on people's lives. Gen Z is more prone to experience these negative impacts because they are a generation that has grown up heavily dependent on digital platforms, which can cause emotional instability and more difficult mental health issues (Kannan & Kumar, 2022). Empirical research conducted in India revealed that the Gen Z population who suffer from Major Depressive Disorder are more likely to engage in some intensive social media usage, including Social Media Addiction, Social Comparison, and Social Interaction (Bhat, Gupta, & Bhat, 2023).

By concentrating on these elements, we are able to accurately identify and cater to the demands of Gen Z students, enhancing their engagement with AI as well as their psychological health.

2.2 Methodology

This work explores the prospect of incorporating AI into human-emotional connections. We expect that privacy and self-disclosure topics are likely to arise during the data collection phase. In-depth interviews provide us with an opportunity to establish rapport and trust between the interviewer and interviewee, where we can explore factors impacting student life, and participants are encouraged to provide honest feedback. The interviews take place in a quiet, safe environment intended to promote active participation and enable honest, informative conversations. Audio recordings and transcripts are only gathered with participants' permission. We also talk about the ethical implications of AI in terms of security, privacy, and transparency.

Overall, getting qualitative insights is the goal of the interviews. In order to evaluate AI's potential for enhancing emotional interactions, we look at its ability to identify and react to emotional cues. Our interview questions focus on the participants' individual experiences, thoughts, and expectations of the advancements in an effort to elicit detailed and encouraging responses from them. These framings are then broken down into three conversation topics: (1) understanding the use of AI, (2) understanding how people establish an emotional connection, and (3) collecting creative inspirations for our design.

Initially, questions with contextual framing are used to assess their understanding of artificial intelligence and the particular tools they apply in real-life situations in order to gain insights regarding AI usage. With this approach, we are able to determine the participants' baseline knowledge and the ways in which they interact with AI technologies on a regular basis. Second, to learn more about how people create emotional connections, open-ended questions that encourage participants to reflect on their personal ways of

building emotional bonds are used. In order to have a deeper understanding of their social dynamics, these questions encourage people to express their expectations and experiences with emotional relationships. Third, imaginative questions ask participants to think about future AI advancements that boost emotional connections in order to inspire future design.

We gather narrative data by collecting insights from two different dimensions in order to investigate the subtle dynamics of emotion inside human interactions with the outside world. The first dimension is concerned with individuals' varied educational backgrounds. The measure is important because findings from various academic areas can provide a more comprehensive aspect of understanding emotional relationships between people and AI. People from different disciplines can impact how they view and understand AI interactions. We can develop and communicate AI systems that consumers find emotionally and morally appealing by combining these points of view.

The second dimension takes participants' past work experience into consideration. This component is essential as it sheds light on how their practical experiences influence their views on artificial intelligence and interpersonal relationships. Individuals with professional backgrounds may have encountered AI at different levels and may be more conscious of privacy and security issues in work environments. This contrast allows us to explore how work experience shapes views on AI's potential to enhance emotional interactions, while also addressing its ethical implications.

2.3 Data Analysis

For the purpose of locating and classifying recurring themes in the information obtained from ten user interviews, we chose thematic analysis (qualitative analysis). Thematic analysis and quantitative coding were used to determine the prevalence of particular beliefs or experiences. By combining these techniques, the study is able to identify both the "why" and the "what" of user activity in addition to data trends. This combination improves the analysis's robustness and usefulness for decision-makers by strengthening the findings' rigor and depth. (Caulfield, 2023; Lumivero, 2024) We do, however, recognize the limitations of using quantitative data from a small sample size of only ten individuals, as this may not yield results that are statistically significant. Nevertheless, because quantitative analysis provides more structure and draws attention to recurrent themes among participants, we decided to incorporate it in addition to the qualitative observations. With this method, we can thoroughly examine the underlying motivations while also gaining a deeper understanding of the frequency of particular behaviors.

Participants in the current analysis expressed satisfaction with the state of AI, stating that it successfully satisfies their needs. The majority thought that having an AI that combines several communication channels and tailors responses would be beneficial. Younger participants—especially those between the ages of 21 and 23—showed that they were aware of AI tools outside of text-based interactions like ChatGPT. They used these tools for a variety of objectives, such as enjoyment and personal help—using Duolingo AI and Snapchat AI, for example.

Furthermore, the trends are also broken down into six themes, each of which is strengthened by pertinent quotes from the participants: hesitation in emotional expression, appreciation of AI's non-judgmental nature, AI perceived as a text-based tool for academic and work-related purposes, emotional connection through quality time and mutual feedback, AI's emotionless and unsettling nature, discomfort and resistance toward forming emotional relationships with AI.

2.3.1 Hesitation in Emotional Expression

The analysis has shown that around 80% of the interviewees demonstrated significant discomfort with the thought of communicating and sharing emotions with an AI tool. We link this discovery with their limited knowledge of AI. Nearly 70% expressed not fully recognizing the full potential of this technology, which results in hesitation and skepticism to engage emotionally with AI.

Relevant quotes:

Makes me feel weird. I prefer personal connections with people. Physical touch and just having somebody who knows my feelings is not enough. (P5)

Never made a research about it, just heard about AI. You ask questions and it finds answers faster than Google. (P2)

2.3.2 Appreciation of AI's non-judgmental nature

Around 60% of participants appreciated AI's non-judgmental nature, stating that they felt more comfortable asking questions they would not generally ask people.

Relevant quote:

I feel secure when asking AI because I don't feel AI would judge me. (P7)

2.3.3 AI is perceived as a Text-Based Tool for Academic and Work-Related Uses

The majority of participants (close to 100%) viewed AI as a tool primarily for academic and work-related tasks. Around 90% of users interacted with AI through text-based platforms like ChatGPT, using it for research, writing assistance, or consultations. Participants often sought AI's help when they needed specific information or quick solutions, highlighting AI's role as a reactive, text-based consultation tool.

Relevant quotes:

I use AI for research, writing emails, and organizing tasks at work. (P4)

I just copy and paste the part I don't understand, and ask ChatGPT to help me define the terminology. (P3)

I only go when I have specific questions that other people sometimes cannot provide answers for. (P1)

2.3.4 Emotional Connection through Quality Time and Mutual Feedback

A significant number of participants, approximately 80%, stated that mutual feedback and spending quality time are how they form emotional connections with others. Interactions in which both parties feel heard and fully participate are valued by the participants. These meaningful interactions, often characterized by empathy and active listening, are critical for developing emotional bonds.

Relevant Quotes:

I connect with people through careful listening and spending quality time together. (P4)

I expect mutual listening, just conversation where both sides feel heard. (P3)

2.3.5 AI's Emotionless and Unsettling Nature

Around 70% of the participants noted that AI's text-based interactions felt robotic and emotionless, lacking the warmth of human communication. Additionally, around 50% of participants found AI's capabilities unsettling or scary, particularly when imagining more emotional or personal interactions. The lack of emotional depth, combined with

AI's increasingly advanced abilities, made some users uncomfortable, leading to feelings of distrust or fear.

Relevant Quotes:

Texts feel robotic, don't have any warmth. (P6)

In general, it's good, but scary how much it can do. (P5)

2.3.6 Discomfort and Resistance Toward Emotional Relationships with AI

Around 80% of participants expressed discomfort and negative feelings when imagining forming emotional relationships with AI. Many found the concept of emotional interactions with AI to be strange, unnatural, or even scary. Participants generally preferred human connections and were resistant to the idea of AI fulfilling emotional roles, reflecting a widespread unease about deeper AI integration into personal and emotional aspects of life.

Relevant Quotes:

It feels strange and uncomfortable to think about forming emotional bonds with something that isn't human. (P3)

Strange, but possible. Not excited, more curious. (P4)

2.4 Defining Technical Approach

To find a solution for the challenges young people face in understanding and managing their emotions, we came up with the idea of developing “AI Buddy”, an AI tool designed to enhance emotional connection and self-awareness. By connecting with the user’s everyday devices, such as smartphones, smartwatches, and headphones, “AI Buddy” facilitates better and quicker interaction with a digital assistant. This multi-device connectivity enables the AI to gather relevant data, such as the user’s voice tone, facial expressions, physical activity, and digital habits, helping it develop a more accurate understanding of the user’s emotions. Through this engagement, “AI Buddy” comes with personalized insights and conversations, making the users more aware of their emotions and creating a safe space to discuss their problems.

Our main challenge in developing this solution was that people might want to avoid opening up about their problems and trust an AI tool. In our day-to-day interactions

with AI, we typically engage with it for practical purposes, often without forming any emotional connection. This lack of emotional engagement presented a key obstacle to fostering a deeper, trust-based relationship between users and the AI (Ma et al., 2024). To overcome this challenge, one solution might be to humanize the way AI interacts with people, simulating a real conversation between humans and creating more trust for users to engage with it conversationally (Churchill and Wiberg, 2024).

Spoken Language Understanding (SLU) for human-machine conversations provides valuable insights for developing AI tools that sound and feel more human. In our “AI Buddy” concept, enhancing SLU plays a significant role in creating a safe space and an emotionally engaging interaction. By utilizing models that integrate different types of input, such as acoustic features, phonetic patterns, and lexical content, “AI Buddy” can better understand not just what a user says, but how they say it. This means the system can detect emotions in the tone of voice, pauses, and hesitations, making it respond in a way that feels more human and supportive (Qian et al., 2019).

Furthermore, SLU research highlights the ability to handle differences in speech, such as accents or expressions, which is important for making AI more accessible and relatable to users who have different backgrounds. These improvements in speech processing can foster trust and openness regarding emotions, as users feel more understood and connected to the AI. By integrating these advanced SLU techniques, “AI Buddy” can create more fluid, intuitive, and emotionally aware conversations, enhancing the overall human-AI relationship (Qian et al., 2019).

In developing “AI Buddy”, it is also essential to focus on making interactions feel more human by making the AI ask questions and engage with the user, not like the traditional way that we are used to, where users ask all of the questions. The study on AI-powered chatbots used for conversational surveys by Xiao et al. (2020) provides a relevant foundation for achieving this goal. Their research demonstrated how AI-driven chatbots could engage users in more meaningful ways than traditional online surveys by utilizing open-ended questions, real-time feedback, and conversational prompts. The AI in this study was able to collect better and more informative responses, as it used Natural Language Processing (NLP) to understand free-text inputs and ask users for deeper insights. By applying conversational AI and NLP technologies, “AI Buddy” can engage users across multiple devices, helping them understand their emotions by encouraging self-reflection and offering personalized feedback.

In the past decade, the integration of artificial intelligence with the Internet of Things (IoT) has revolutionized daily interactions with technology (Knickerbocker et al, 2018). In our project “AI Buddy” we aim to create an intuitive and seamless navigation ser-

vice that enhances the user experience across various devices, specifically smartphones, smartwatches, and headphones.

In designing “AI Buddy” we aim to create an assistant, capable of reading, comprehending, and responding to user’s experiences and prompts, in our development of a solution that connects to all user’s IoT devices to provide personalized assistance and accurate interpretations. In this ecosystem, we will use smartwatches and smartphones for measuring physical and mental health-related data by using object detection for facial expressions and not only identifying the user within the image but also using deep machine learning, to identify and recognize their emotions (Gaya-Morey et al., 2024). Various methods can be implemented to provide accurate and efficient facial expression detection and recognition such as a Semi-Isotropic L-shaped network or simply SiLNet, and a You Only Look Once algorithm named YOLOv8. Smartwatches specifically can measure, monitor, and collect user’s daily physical activity, heart rate, stress level, and blood oxygen. By integrating this technology with “AI Buddy” it can significantly enhance its functionality and user experience by providing personalized voice assistance and insights in real-time via headphones.

Additionally, headphones will be used as an intermediary framework in communication between the user and “AI Buddy”. These devices will function as a primary data input mechanism, capturing voice inputs for the purpose of machine learning and user interaction. Moreover, they will provide audio feedback, by assisting a seamless and interactive user experience. In correlation with the interview data that showcases the concerns and reluctant feelings towards “AI Buddy” being integrated into daily interactions, it is important to address it. By creating a safe mechanism that limits the permissions of the AI to preferable settings such as access to the camera and gallery, microphone, audio or text notifications, location, body sensors, and physical activity.

2.5 Overview of the user study

Our user study demonstrates the complex connection between student emotional demands and AI interaction. We can improve the ”AI Buddy” creation process by comprehending the distinct emotional swings. Through in-depth interviews, a specially devised technique investigated how AI may improve emotional intelligence, human-computer interaction, emotional bonds, and creative inspiration. The data analysis produced a number of important insights that demonstrated the interviewee’s hesitancy and resistance to emotionally engaging with AI. Additionally, as it is used for both emotional and personal advice in addition to academic and professional responsibilities, an impartial character is

also appreciated. The definition of an "AI Buddy's" technological approach was influenced by interviews.

In order to overcome users' reluctance to adopt artificial intelligence tools, we emphasize the significance of building trust and emotional engagement with them. We aim to overcome this by utilizing advanced SLU methods and merging conversational AI and NLP technology. "AI Buddy" is an assistant that can read, understand, and react to voice cues and user experiences, will be able to connect to any IoT devices, and offer precise interpretations and individualized support. This establishes the framework and specifications for the creation and development of an "AI Buddy."

3 Designing the prototype

3.1 Design ideation and process

At this point, with the established framework and specifications for the creation and development of an "AI Buddy", the design phase takes place. It was crucial in the development of the preliminary designs to identify our target customers, articulate the statement of need, define the product and category, highlight the key benefits, establish the company's unique value, and differentiate it from competitive alternatives. Utilizing an elevator pitch approach, significantly facilitated this process.

Through the use of interviews, our target group was identified as Gen-Z students, as the interviewees shared their difficulties in showing emotional vulnerability and fear of judgment. We have identified that most students establish emotional connections through quality time, and mutual feedback and expressed mixed feelings for AI, but outlined the need for privacy, security, and a sense of having full control over the technology. That has resulted in the need for the creation of an AI assistant with the product name "AI Buddy".

We have identified already existing solutions like "ChatGPT", "Snapchat AI", "Siri", "The Couples bracelet", and "BMind" and highlighted the main differences and value of our application. This includes its neutral safe sharing place, raising awareness about users' potential emotional issues and helping identify them, and intuitive interaction based on real-world context. From a more technical perspective "AI Buddy" can provide users with insight notifications, multiple device connectivity, a variety of input data, and even three senses interaction.

3.2 Brainstorming and initial sketches

In the ideation session to formulate a design solution, the creative technique of brainstorming, an individual hands-on sketch, and a collaborative discussion were undertaken. Then, the steps to ideate the design proposal are divided into (1) visual brainstorming through the collaborative platform FigJam and (2) an individual hand-drawn sketch.

The brainstorming resulted in a visual board with multiple ideas for both potential features and graphic solutions (Figure 3.1). A rating of the best ideas was conducted and decided the design solution's direction: An interface that moves away from text-based input and promotes vocal interactions.

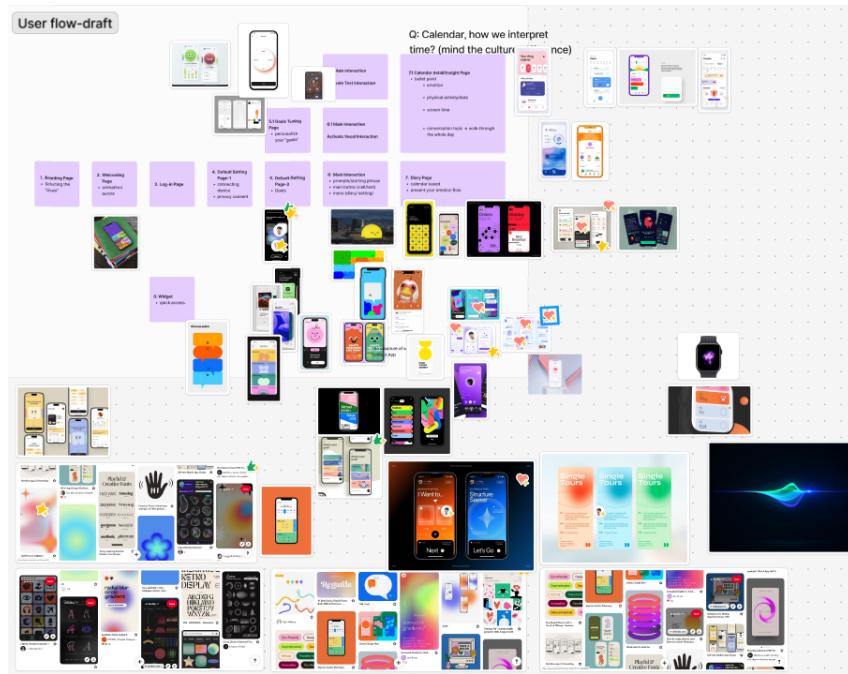


Figure 3.1: Visual brainstorming in the platform FigJam

In the second step, based on the previously determined considerations, the individual hand-drawn sketches were completed within a timed 15-minute period, resulting in six sketches (Figure 3.2).

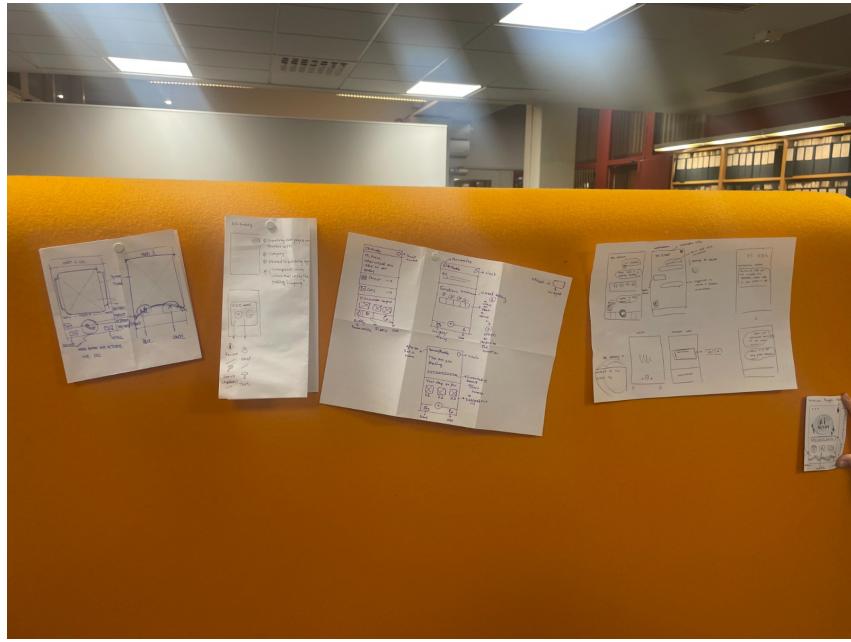


Figure 3.2: Hand-drawn sketches

We have chosen both approaches to see multiple points of view from each member of the team and decide our trajectory for starting the concept design that we will develop in Figma and send for peer review.

3.3 Design concept in Figma

In developing this product, we aimed to create a minimalist and intuitive design that allows users to feel comfortable and focused while interacting with the AI. The design is intentionally simple and non-intrusive, ensuring that users can engage with AI Buddy without feeling overwhelmed by a cluttered interface or unnecessary features, and also giving them control over what AI can access. By prioritizing a clean, easy-to-use interface, we allow users to put their attention toward their emotional well-being and personal growth, rather than navigating a complex system. This minimalist approach helps create an environment where users can comfortably focus on their goals and develop trust in "AI Buddy".

The Boarding page (Figure 3.3) is designed to introduce users to the "AI Buddy" application. It was important to include the name of the app and a concise description or introduction to immediately engage users. Following the Welcome page, the Sign-in or Register choices were included to facilitate user authentication. This step was crucial as it allows the creation of a personalized account, making it easy to engage and get started with the application's functionalities.

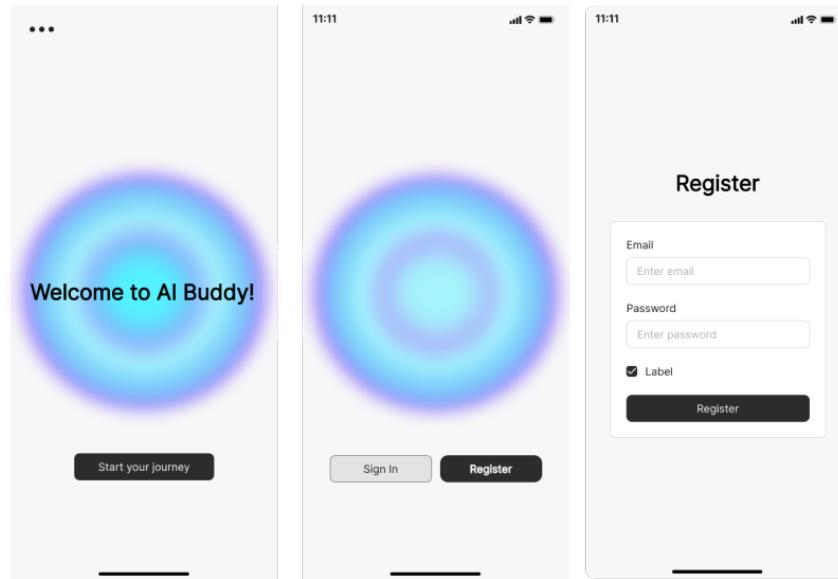


Figure 3.3: Boarding Page I

The next page (Figure 3.5) is designed to guide users through the initial setup process, where the users set their personal preferences and goals. The page “Set your goals” enables users to choose and decide what they aim to achieve with the “AI Buddy” such as entertainment, mindfulness, or productivity. Additionally, the next page facilitates the connection of external devices, specifically headphones and smartwatches, via Bluetooth.

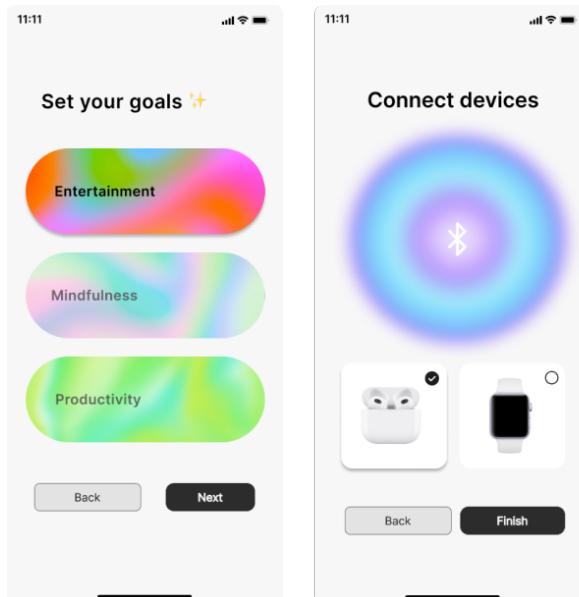


Figure 3.4: Boarding Page II

The next pages (Figure 3.5) detail the communication methods, which enable the users to interact with ”AI Buddy” through various input and output options. The page

outlines how to initiate phone calls for users who prefer verbal interaction. Additionally, the application presents assistance via chat or voice.

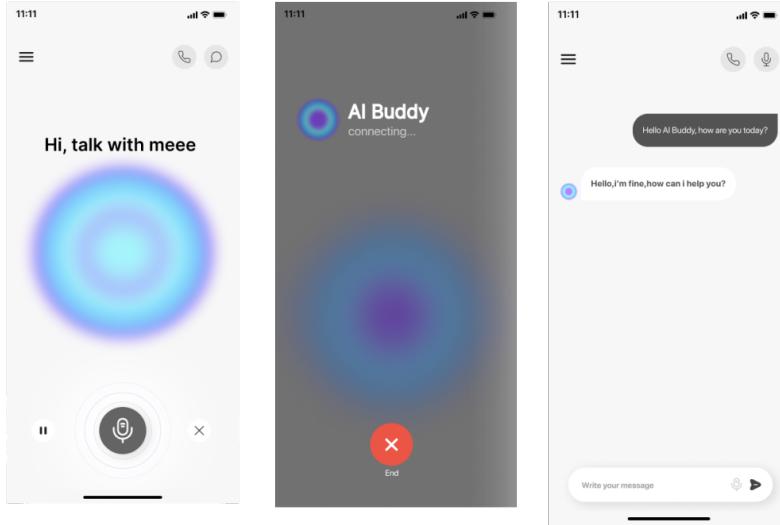


Figure 3.5: Communication methods

The Calendar View page (Figure 3.6) is designed to provide users with an overview of their daily activities and interactions, as analyzed and archived by AI. This page serves as a personalized diary, presenting detailed and structured summaries throughout the day, that can be expanded. The AI's analyses are archived in a calendar format that allows users to easily review and reflect on their past interactions and experiences. In addition to the diary, the Calendar page features a pie chart that displays the user's emotional states throughout the day too. By visualizing these emotional patterns, it helps a user to gain a better understanding and raise emotional awareness.

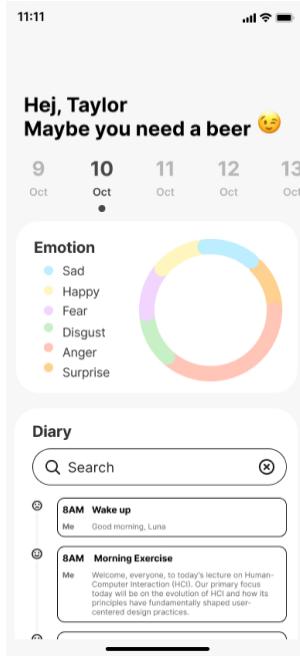


Figure 3.6: Archive of the AI's analyses

The Settings and Permissions pages (Figure 3.7) are crucial components of an “AI Buddy” application, that provide users with the ability to view and modify their account details, diary archive, personalized goals, and connected devices. This page is designed to control the app’s functionalities for the user’s specific preferences. Within the page, the users can as well edit the access settings, as it empowers the user’s control over the AI’s permissions, personal data security, and privacy. Users can limit access to body sensors, calendars, cameras, contacts, locations, microphones, nearby devices, notifications, phones, physical activity, photos, and videos. This feature ensures users protection over their personal information and helps maintain the desired level of privacy.

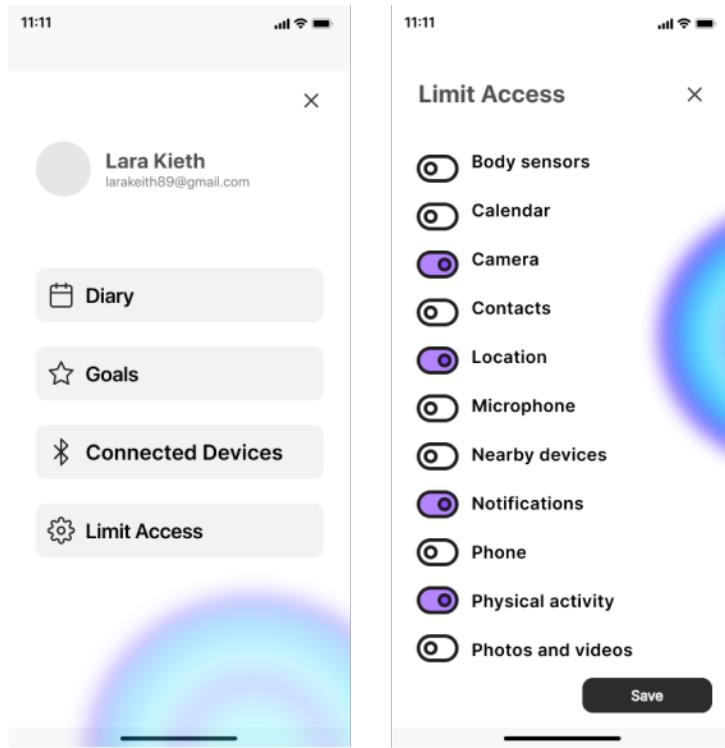


Figure 3.7: Settings and Permissions

To provide quick and easy access to "AI Buddy" users can also add an interactive widget directly to their home screen (Figure 3.8). This feature helps access the call function of the application with only one click on the widget, allowing users to interact with "AI Buddy" without the need to open it.



Figure 3.8: Widget

The "AI Buddy" application is accessible through smartwatches too, providing users with a convenient way to interact with the app. The smartwatch not only tracks the user's daily physical activity but also serves as quick access to the app's features. Users can interact with "AI Buddy" through smartwatch via voice, receive notifications, and view calendars and diaries. This integration ensures users' connectivity and efficiency with the

”AI Buddy”.



Figure 3.9: Watch features

3.4 Revised design after peer review

After submitting our Figma concept for peer review, we carefully considered the feedback provided by our classmates to further refine our design. Their feedback helped us identify areas where the user experience could be improved, in terms of navigation, context, and clarity. We used these insights to make adjustments that would create a more intuitive experience for users, ensuring that we provide context and target their needs.

Additionally, we incorporated key principles from Andy Budd’s heuristics for modern web application development (2007), focusing on simplifying the interface, having consistency in our design, and providing clear feedback to users during their interaction. This approach allowed us to create an experience that feels natural and engaging while keeping the user in control of the app.

In order to provide more context for the first interaction with the app, we decided to change the Boarding page (Figure 3.10) by presenting the user an overview of what the app can do and how they can benefit from it. Also, the logo of the app was changed into a more modern and minimalist one that gives the feeling of an AI-centered app.

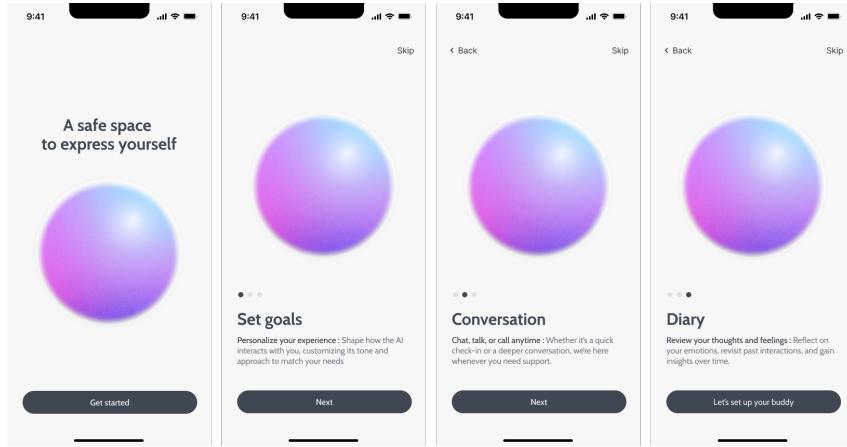


Figure 3.10: Boarding Page I

Regarding the second Boarding page (Figure 3.11), the main goal was to give the users more insights into how the connected devices can improve their experience and how setting goals can benefit them. By letting the users know that they can adjust their goals at any time, the app doesn't make them as anxious about making the right choice from the beginning and they can also see how each goal can change the tone of their "AI Buddy". We thought of making the onboarding as simple and non-intrusive as possible. So, letting the user interact with the app first and being reminded to sign up if wanted (Figure 3.12) when they reopen the app would be a solution to make the experience more enjoyable.

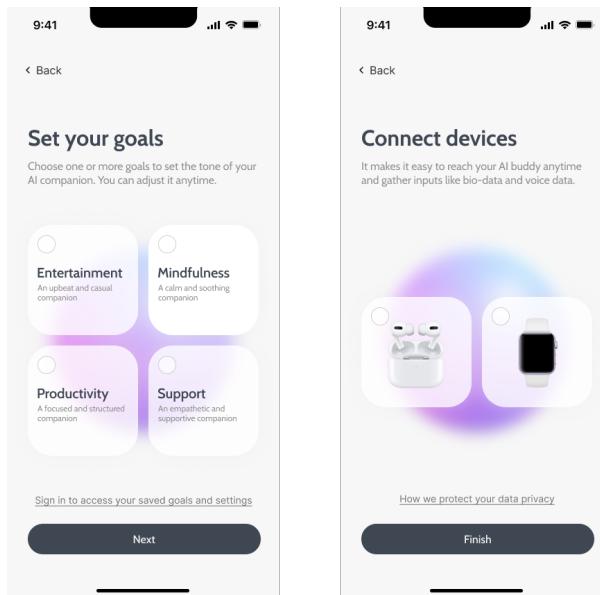


Figure 3.11: Boarding Page II

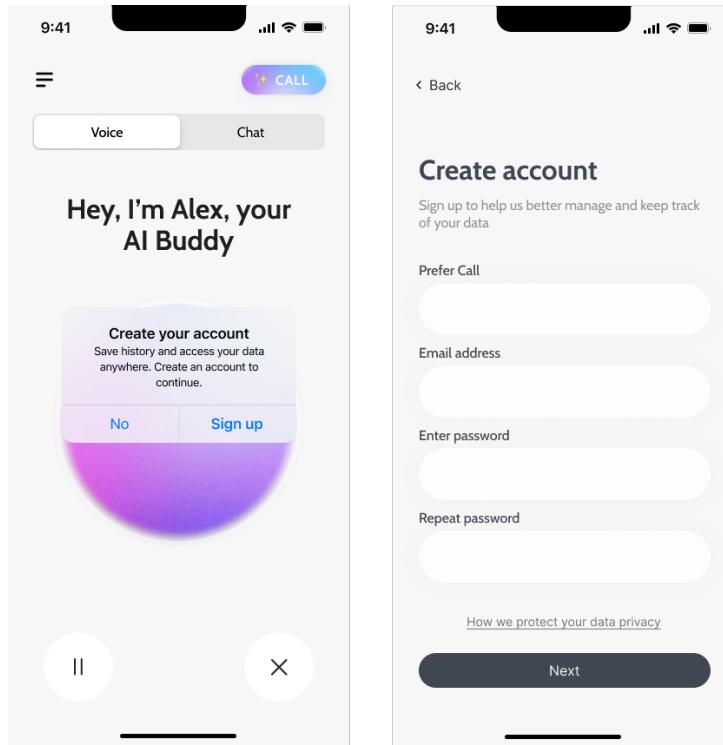


Figure 3.12: Sign Up Page

For the main page of the app (Figure 3.13), the focus was to differentiate each communication method intuitively. The app will open on the Voice page, where we got rid of the extra voice button and we made pressing the logo activate the voice conversation. Also, by adding a toggle between "Voice" and "Chat", it is easier for the user to change the conversation quickly and differentiate these two features from the "Call" feature that now has a special button, mimicking the interaction with a real person by calling the "AI Buddy".

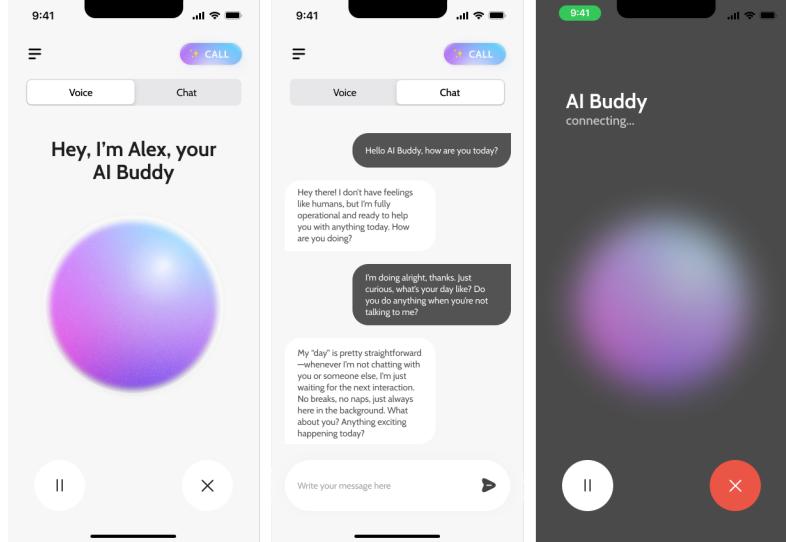


Figure 3.13: Communication methods

The next feature, the Diary (Figure 3.14) has changed from one page to three pages, making the experience more interactive and the interface more intuitive. The default page is the calendar one, where users can quickly see an emoji that sums up their day and a few insights that make finding a certain day easier. When a day from the calendar is expanded, it goes to an overview page where users can see what their detected main emotions were, and an AI-generated diary with the main events and insights of the day that can be edited by the user if they feel the need. Also, the user is asked certain questions to improve the AI-generated diary and to make it more accurate.

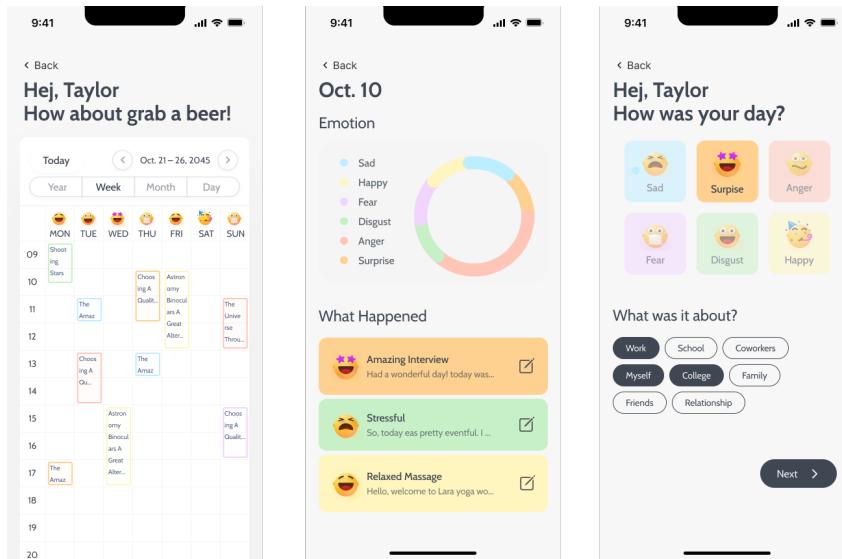


Figure 3.14: Archive of the AI's analyses

The Settings page and the Permissions page (Figure 3.15) were changed by approaching a cleaner interface and including the missing elements like the "Back" button, aspects that would make the users' experience more pleasurable.

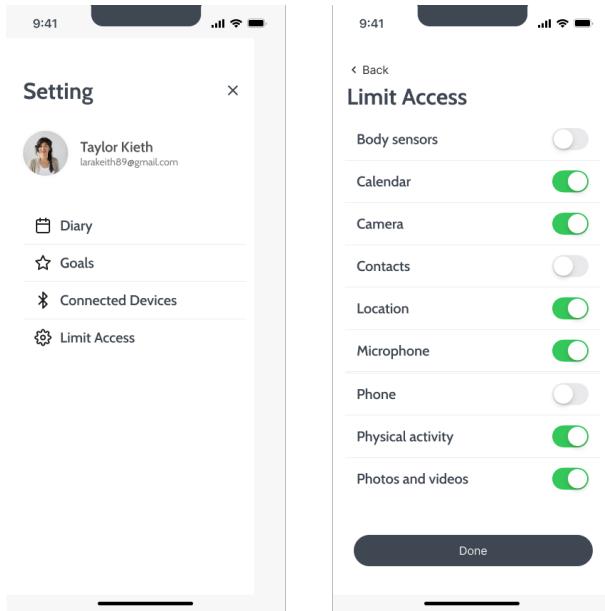


Figure 3.15: Settings and Permissions

For the Widget feature (Figure 3.16), the focus was only on design, to make it cleaner and to make the "Call" feature that happens after pressing it more obvious to the users.

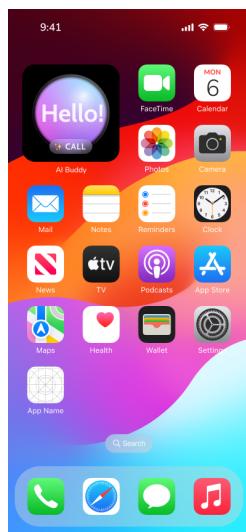


Figure 3.16: Widget

Finally, regarding the smartwatch interface (Figure 3.17), we added the call feature that would make it more accessible when the user needs it and doesn't have their phone on hand, or they can pair it with headphones without the need for their smartphone. Additionally, we also changed the logo of the app and made the interface cleaner and more pleasant for the small screen of the watches.



Figure 3.17: Watch features

4 Conclusions

4.1 Limitations

It is important to acknowledge certain limitations within the project. Firstly, the small sample of user interviews may not represent the broader population to the fullest, potentially limiting the broader applicability of our findings. Secondly, the subjective nature of emotional engagement interpretations among users may not be fully captured in the design. Additionally, the rapid technological changes in AI and HCI fields make our design choices necessitate iterations and further updates.

Furthermore, we are prioritizing user data privacy and security with the limitation of access. However, if users restrict the application's access, it significantly diminishes its functionality and overall user experience.

Moreover, while AI as an emotional companion presents a significant potential to enhance user experience, its integration into everyday life raises important ethical and practical concerns. Constant surveillance and monitoring, which are inherent to such AI systems, could become a serious issue, both in terms of user privacy and autonomy. The effectiveness of these AI companions is also highly dependent on the quality and reliability of the connected devices, making them vulnerable to technological limitations and breakdowns. Moreover, the ethical dilemma of embedding AI into emotional and decision-making aspects of life raises questions about psychological dependency. As users increasingly rely on AI for everyday decisions, it may reduce their capacity for independent thought and emotional resilience. Further discussions must consider how to mitigate these risks while maximizing the benefits of AI in a balanced and ethical manner.

4.2 Discussion

This project report explored the intersection of emotional engagement and Artificial Intelligence technology through the development of our prototype, "AI Buddy". Through a user study, it was revealed that participants expressed interest in creating an emotional connection with AI. However, they expressed concerns regarding their data privacy and ethics.

Our proposal of "AI Buddy" serves as a conceptual framework for future research and development, aiming to bridge the gap between human emotional needs and AI capabilities. By fostering deeper emotional connections, it could change the way people perceive and engage with technology.

Through the design process, which included brainstorming sessions, individual sketching, and collaborative discussions, we were able to generate an intuitive and seamless user flow that prioritized security and user experience. The integration of peer feedback helped us refine areas such as navigation, context, and overall user experience.

We hope that this study contributes to the growing field of Human-Computer Interaction by highlighting the importance of understanding emotional dynamics between humans and AI-centered technology. As this field moves forward, it is crucial to continue exploring the ethical themes of AI-integrated technology and address the considerations of emotional engagement and reliance on this technology.

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6 Appendix

Title	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Age	21	21	22	21	23	29	27	23	21	24
Nationality	Ukrainian	Romanian	Romanian	Ukrainian	Swedish	Taiwanese	Indian	Swedish	Swedish	German
Family status	Single	Single	Single	Dating	Single	Single	Single	Single	Dating	Single
Status	Studying	Studying	Working	Working	Studying	Studying (Worked)	Studying (Worked)	Studying	Studying	Studying
Background	Mathematics and data science	Medical	Mathematics	International Economics	Biology	Nursing	Human-Computer Interaction	Computer science	Computer science	Cognitive science
Living status	With roommates	Alone	Alone	Living with a girlfriend	With roommates	With roommates	With roommates	With roommates	Alone	With roommates

Figure 6.1: The background of the interviewed people

The script and questions that we followed during the interview process

To start, I'd like to gather some basic background information about you. This will help us get to know you better and understand your experiences.

- *Could you please tell me your name?*
- *How old are you?*
- *What is your nationality?*
- *Are you currently single, dating, or married?*
- *What is your current occupation or field of study?*
- *And finally, what is your current living status? For example, do you live alone, with family, or with roommates?*

Next, I'd like to ask you about your usage of artificial intelligence (AI).

- *First, could you define your understanding of AI?*
- *In what situations or contexts do you use AI?*
- *Which tools or technologies do you use? Could you give an example?*
- *What is the purpose of your usage of AI?*

Now, I'd like to move on to some more personal questions. If you feel uncomfortable at any point during this interview, please let me know, and we can skip to the next question.

- *How do you seek an emotional connection with other people?*
- *What are your expectations when emotionally interacting with people?*
- *What is your experience with current AI?*
- *What are your expectations when using AI tools and technologies?*
- *How does your interaction with AI differ from your daily interactions with people?*

Now I'd like you to imagine a scenario where there is an AI tool that connects your devices, such as your headphones, smartwatch, and mobile phone. This AI understands your feelings, interactions, and experiences, and is able to create an emotional connection with you.

- *How do you imagine this interaction would be?*
- *Do you think you would benefit from it? If so, how?*
- *How does forming emotional relationships with AI make you feel?*

Thank you for your answers, now moving on to the end of our interview, do you have any further questions for me or any additional thoughts on the topic?

Thank you for your time!

Hand-drawn sketches for brainstorming

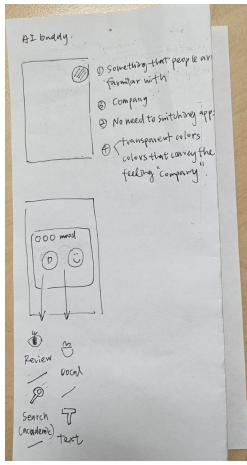


Figure 6.2:
Drawing 1

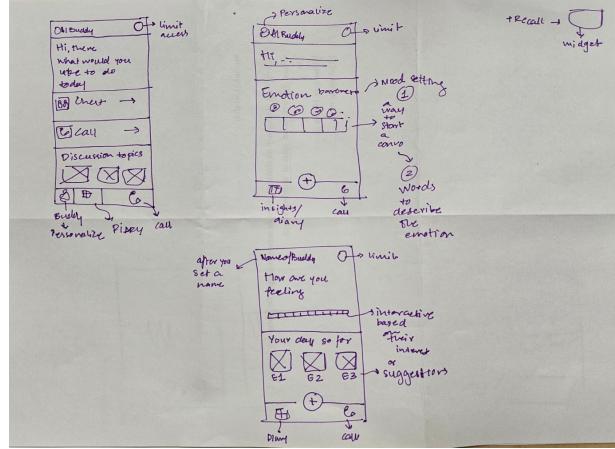


Figure 6.3: Drawing 2

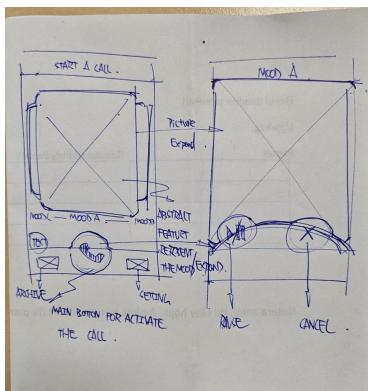


Figure 6.4: Drawing 3

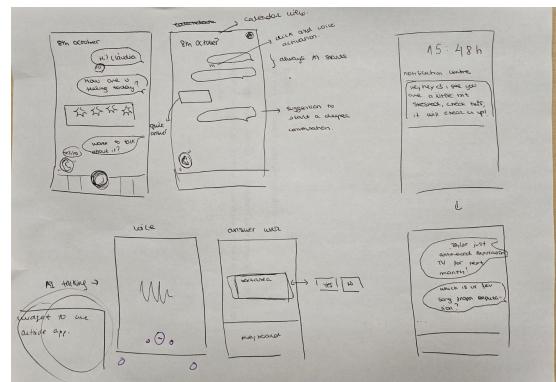


Figure 6.5: Drawing 4

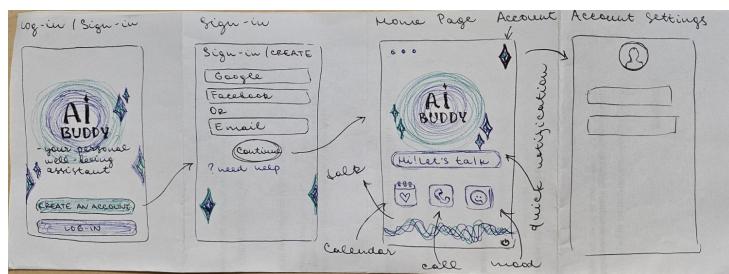


Figure 6.6: Drawing 5