

## Midterm reflection

During my time as an Industrial Design student I have become aware of emerging technologies and experimented a bit with some. Nevertheless, this experience, knowledge and awareness was quite minimal. Therefore I wanted to increase my awareness about emerging technologies and how to incorporate them in my own design work. This made me decide to take the course Designing User Interfaces with Emerging Technologies.

One of my personal learning points for this course was to get a better understanding of what an emerging technology is and how I can keep up with these trends. As a designer with a background in technology, I believe it is important to keep up to date with innovations and be aware of what is happening or might happen in the field. A skill I learned during this course is how to spend your time reading a paper in the most efficient way. I taught me how to go through a number of papers in a limited amount of time, something we practiced during one of the lectures. This has improved my research skills and has been helpful for other projects as well as to be able to keep up to date with emerging technologies.

Another learning point for me was how these emerging technologies can be used to create innovative and sometimes even futuristic user interfaces. We practiced this during the scenario assignments and lectures, as well as in the final design assignment. This opened up my imagination about the possibilities that these emerging technologies create. Besides that, a learning goal of mine was to see how these emerging technologies can mean something to the community. This relates to my vision and identity as a designer. I find it important to create design with societal impact and my personal focus is in the healthcare section. As far as my experience goes, I feel like this field can be quite traditional and adverse to innovation. It is refreshing to see new technologies and how these can be implemented in daily life. The emerging technologies we discussed show potential to form intuitive, non-obtrusive interfaces, something I value and see as requirements for design in healthcare. As for many things, not all emerging technologies fit this context. Since I am often working with vulnerable target groups, futuristic interfaces and technologies might not always be desired. Nevertheless, I see many opportunities to apply the knowledge I gained to my current and future projects. This course taught me how to envision a technology such as RESi being used in the field. Taking RESi as an example again, this interface could be used to create accessible interfaces for rehabilitation purposes. The versatile application possibilities make it possible to embody the interface into many objects. It might even be possible to create handmade, personalized user interfaces to cater to the specific user needs and taking into account any movement or sensing limitations due to, among other things, illness or disorders. The fast prototyping aspect of RESi allow the designer to create experimental prototypes and receives user feedback in a short time span, allowing for multiple, short iterations.

Finally, one of my learning goals was to learn and practice new realization techniques to work on my technology and realization expertise area. This relates to my expectations of the course as well as the limitations due to the current Covid-19 situation. My expectations before starting this course where that it would be a very hands-on course with a lot of prototyping. This turned out to be less than I expected, mostly due to COVID-19 regulations and my personal time division. As a group, we decided to use a Wizard of Oz approach for our final design, since we expect it is too difficult to actually realize the technology we want to use and test it in a safe and ethical way within the time span of the course. Unfortunately, since I was really looking forward to creating and testing a working prototype. However, considering the course structure and the COVID-19 regulations, this is understandable.

Overall I believe that collaboration in our group is good and we are all on the same page in regards to our working behaviour. At moments it has felt a bit unbalanced, with some people being more exuberant and others less active, but this has not formed a problem in our group dynamic. I view myself as being in the middle of this, actively trying to be collaborating and communicating, but I am aware that I am not the most outspoken person.

My main insights and takeaways were discussed in the section about my learning points. I want to add that I was slightly surprised at the accessibility of some of the emerging technologies that we discussed. As an example, RESi, a flexible, pressure sensitive textile interface, highlights the opportunity for fast prototyping with the technology. This insight made me more open minded about using emerging technologies in my own design work, since some allow for quick implementation and fast prototyping. This creates the opportunity for experimentation with different technologies in a short time frame.

The second half of the course I would like to focus more on the user aspect of emerging technologies. Since we will be working on our design project, this will be an important aspect we need to consider. I am planning on looking more into the relevance of emerging technologies for the user. How the technology is perceived by the user plays an important role in the acceptance of the new technology. This really fits the design my group and I are working one. We will be designing a product that uses electronic muscle stimulation to change the user's form and posture. I can imagine that some users might see this as quite invasive. It is important to use the technology and design product in such a way that it will be accepted and trusted by the user. This underlines the need to thoroughly think about the user's needs and how to cater to them, using emerging technologies.

## Final reflection

For the course Designing User Interfaces with Emerging Technologies I explored different emerging technologies and worked on a group project. The last weeks were mostly focused on the project, in which I (together with my team members), explored a new application of Electronic Muscle Stimulation (EMS). Halfway in the course, I already wrote a reflection, on which I will reflect in this reflection.

My main goal for this course was to develop my technology and realization expertise area by learning new realization techniques. Unfortunately, we were not able to realize a physical prototype and only made a concept video. In my personal opinion, I could have increased my learning progress more if we did focus more on the realization of a physical prototype. However, due to the time constraints, COVID situation and ethical considerations, it would have been quite difficult to realize a prototype for our specific project. I described in my midterm reflection that I came to the realization that most emerging technologies are very approachable and enable quick prototyping. Unfortunately this was not the case for the prototype we envisioned. First of all, user testing with EMS, which can control one's muscles, requires thorough ethical considerations. Besides that, the prototype should be tested for safety. To circumvent these issues, we made a concept video. However, we struggled quite a lot with bringing across the concept and effect of EMS through this platform. This brought me insights into ways to communicate a concept or technology, without letting the user physically experience it.

In my midterm reflection I stated the following: The second half of the course I would like to focus more on the user aspect of emerging technologies. Since we will be working on our design project, this will be an important aspect we need to consider. I am planning on looking more into the relevance of emerging technologies for the user. How the technology is perceived by the user plays an important role in the acceptance of the new technology. During the last weeks of the course, this is exactly what I focused on. Our concept is a product that embodies both inertial sensors and EMS electrodes to measure any incorrect form and automatically correct it by activating the muscles. We conducted a user study to research how this concept is perceived by potential users. This included insights into the participants' expected usage, possible constraints and other possible applications. This research was focussed on the use of EMS in a specific context, however, I believe that some of my personal insights will be applicable to emerging technologies in general. I was, for example, surprised that the participants appeared to be more concerned with technical safety than with agency. I expected this to be the other way around. I suspect this is partly due to the fact that the participants were not able to physically experience the effect of the product on their own body (and they were not familiar with it). Therefore, they might not be fully able to imagine the role of agency in the use of such a product. Yet, product malfunctioning is more familiar to the participant. This made me realize that there are some part that might not come across as strongly from user interviews, but is claimed in literature and common sense design theory. In these cases, it is the designer's job to explore the needs of the user's, even if they are not outspoken about it.

In conclusion, my main takeaways from this course are new knowledge about emerging technologies that I had not heard of before, insights in the user experience with these technologies, new realization techniques, and what we as designers need to keep in mind when we designing with emerging technologies. I can apply this knowledge in future projects. As a designer with a focus on healthcare, I am interesting in using emerging technologies to improve quality of life.