Progress Report

CERN IdeaSquare Summer School

Group 2 - EyeR

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ATTRACT

CERN IdeaSquare

TU Delft
Delft University of Technology

Erasmus Universiteit Rotterdam

University of Amsterdam

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1. Team members

1.1. Bas ter Veer

Hey, I'm Sebastiaan (Bas), a recent Strategic Management MSc graduate from the Rotterdam School of Management, Erasmus University. With my background in International business and passion for teaching, I have been working with both students and stakeholders on innovative solutions and projects over the last four years. Despite not having a STEM background, I was extremely excited to have the opportunity to join this summer school. I felt that this was a unique chance to work together with a talented group of individuals with whom to create an impact at one of the world's leading scientific institutions. A feeling which has been confirmed throughout the project.

1.2. Domen Skerlep

My name is Domen Skerlep, an Aerospace Engineering BSc graduate from the Delft University of Technology. I have always been intrigued by the aviation sector, which was the main reason to pursue my degree and in the next few years also a pilot’s licence. My long-aspired goal is to establish a company within the aviation industry, therefore having the opportunity to work on an entrepreneurial task is of great interest to me. Additionally, collaborating with students from different backgrounds might bring its own challenges however it normally also gives unexpected outcomes and is beneficial when it comes to entrepreneurship. Especially when trying to develop many ideas for the alternative application of the ATTRACT technology, having diverse backgrounds is very important. Each student also brings new knowledge from their respective field.

I believe that I can contribute to this team in various ways. Firstly, when I was younger I joined a university team in Ljubljana, where we had to design and prototype an RC aircraft for the DBF competition. Having this experience will come in helpful during the prototyping phase. In addition, during my exchange semester, I took a course in Technology and Innovation Management, where I acquired lots of useful concepts and techniques that are required to develop a certain startup and idea. This closely correlates with what this course is about as well. Besides my academic experience, I have also been professionally playing volleyball and beach volleyball for the last 12 years. This has given me significant experience in teamwork and collaboration, which will undoubtedly be of great value in a team with diverse backgrounds.

1.3. Oza Passot

Hello, I am Oza, a passionate Physics student at the University of Amsterdam. I have always had many different interests and it was hard for me to focus on one particular thing. That is why I moved to Maastricht to do a Bachelor's in natural sciences, allowing me to focus on physics and mathematics in a broad sense. Throughout my academic journey, I realised that theoretical physics appealed to me in many ways; it is a discipline that requires creativity, rigour, and before all, curiosity. Although I am pretty certain that I will follow an academic path, meaning doing a PhD and so forth, I want to stay open-minded about the future. You never know where your curiosity will lead you. Having that in mind, I was very excited to start the CERN Ideasquare summer school because innovation is probably the best way to train creativity and satisfy one's curiosity!

1.4. Patrick O'Donnell

Hi, I'm Patrick, a third-year BSc Nanobiology student at TU Delft. I moved to The Netherlands for my bachelor's degree in 2021 and have lived in Delft ever since. I have an interest in bioengineering and biophysics and am especially interested in the field of optics. I took part in the Honours programme at Delft in order to get to know other interested students and broaden my academic knowledge. I was especially excited to take part in the CERN IdeaSquare Summer school as I had always wanted to visit CERN and I have a deep interest in tech transfer and finding applications for cutting-edge technology in everyday life. I am particularly interested in bringing new technologies to bear in the healthcare setting as this is an area I find particularly interesting and I am inspired by previous life-saving medical imaging technologies developed at CERN such as PET tomography.

1.5. Zhuoyue Ge

Hello, I am Zhuoyue, currently a third-year Computer Science and Engineering student at TUDelft. Along with my regular program, I also participate in the Awareness and Culture honours program, where I explore the intersection of technology and the real world through the lens of art. My curiosity drives me to seek innovative solutions to complex problems, and I was thrilled to have the chance to take part in the CERN HPD Summer Course. I looked forward to immersing myself in CERN's cutting-edge technologies, exploring their societal impact, and engaging in creative problem-solving workshops. I was particularly excited about the chance to work with my team members with diverse backgrounds and contribute together a scientific paper to the CERN IdeaSquare Journal for Experimental Innovation.

2. Innovation process, steps, choices & Milestones (e.g. Design Thinking Process, use mural)

The innovation process at the summer school started out with the separation into distinct teams. As the group didn't know each other, the first step in our innovation journey was to get to know each other better. This is captured in the first Mural page, where we described our personalities, values, goals, and unique skills and set up clear rules on how we wanted to work with each other in the coming months. Our team motto Ingenuity, Excellence and Decisiveness became the core of our collaboration and set the tone of how we wanted our final product to be.

As a team, we got to pick a technology, for which we picked Microquad. Microquad is an advanced Superconducting Single Photon Detector and TCSPC modules. In order to help us better understand the technology, we started to 'unbundle' it. This included coming up with a simplified explanation of what the technology does as if we were explaining it to a 5-year-old. This helped to increase our core understanding of the technology and turned out to be really helpful in figuring out applications within the industry. Additionally, We had an interview with our technology expert, who was able to explain to us how the detector works and what the machine looks like in a practical setting (more on that later).

With a surface-level understanding of the technology, we were tasked to figure out what potential applications it could be used for. This began with identifying a large range of different industries, ranging from farming, and space exploration to fashion. As we really wanted to find an innovative application for Microquad, we decided that even the strangest industries or applications could be considered. This resulted in about 50 different potential industries in which the technology could be used in one way or another. Within each industry, Microquad would perform a specific function, for example, real-time crop monitoring could be used within the Agricultural industry. Or you could monitor the exact Leaf water content within a specific plant. Hence, we picked out 10 industries which could have the most impactful applications and brainstormed about the specific applications within that field.

While we now had some interesting industries and applications, we wanted to push ourselves even further to try and discover any other worthwhile applications. This was done with the help of three very creative canvases, the imagination, SDG and C-box canvas. The imagination canvas was incredibly fun, as each team member picked a random piece of fiction and tried to find 5 scenes within that fictional media and identify whether Microquad could be used within the scene. Meanwhile, the ESG canvas set a more serious tone, as we tried to identify which industrial Microquad applications could be used to solve some of the United Nations Development Goals, like clean water or gender equality. It was important for us that our innovation would adhere to some SDG goals, thus we discarded some that did not improve any goal. The third and final canvas, C-box, turned out to be very thought-provoking. Within the canvas, we placed problems/industries within a matrix based on their Urgency versus importance. This helped us identify which applications would really make an impact, namely those that were both Urgent and Important. All of these different canvases helped us to create the ideation wheel canvas, where we pooled all of our different ideas together in one big overview.

This marked a key point in our innovation process, as we had reduced our potential applications to 10, with each application being thoroughly researched. By this time, we had also started the sprint part of the summer school, and thus we were allowed to prototype some of our ideas in a simplified physical form (see Mural). For this prototyping, we picked a space rover, a Deep space telescope and a CO2 detector. Combined with the prototyping, we then proceeded to make a tech-application fit canvas for each of these applications, with the goal of understanding the market surrounding our solutions.

When we went to Geneva, we were therefore already quite prepared and had some application ideas. However, none seemed to really stand out and we found ourselves kind of stuck. The main issue was that we had the incentive to think “outside of the box” but were at the same time constrained by the technical requirements behind Microquad. The superconductor needs to be cooled down to 2.5K for the system to work, which means that a compressor is required. Dimension-wise, it is very limiting in terms of applications because it meant that we had to think of something static, preferably not in a hostile environment like space.

On top of that, Microquad is an expensive machine usually used in specific laboratories. The cost of one of these is estimated at 150K EUR minimum. From this information, it was highly challenging to come up with potential applications that can reach a lot of people while contributing to the SDGs. That is probably the moment we actually understood that we would have to develop an idea where Microquad is used by many different people, to reduce the cost of a single-use so to say.

Use of Mural in Ideation Process

We used the mural tool in order to facilitate our ideation process, this meant that we structured our thinking using the graphical interface of the mural and used the collaborative functions of mural in order to work together as a team towards a common understanding of our idea. To start with we used Mural to get to know each other by filling in our personality types, establishing team rules and identifying challenges that we might face. This helped us as we went forward as it gave us valuable information on how we could best work together as a team.

Then, during the technology unbundling phase, we used the mural to share our “We know how to” statements in a collaborative manner. These ideas included: “Decrease radiation dosages during biomedical imaging” and “Make better night vision and low light vision”. This was very helpful as it provided a framework for the ideas that we would develop later by helping us identify what aspects of our technology were truly new and unique. We then refined our “We know how to” statements using feedback from the programme coordinators and used them during the explanation video which we used to create the illustration.

We also used the Mural when formulating our hypothesis and ideas for the paper. We worked together to identify the audience for the paper, formulate a research question, assess what data we would need to collect and provide a motivation for our research. We then combined these different aspects to collate a list of actions that we felt were necessary to fulfil our goals.

We then used the mural to create a list of industries and domains in which our technology may be of use. These included the industries of cosmetics, climate and pharmaceuticals. We came up with over 50 unique ideas for uses for our technology each of which was helpful in allowing us to further consider possible use cases. We then further developed a select number of these ideas to assess their feasibility and usefulness and put this in the context of our “We know how to” statement. We also undertook an interesting exercise where we identified how our technology could be of use to a fictional character for example Shrek. This exercise was useful in making us think of some outside-the-box use cases for our technology.

Another important aspect of our mural was the 17 sustainable development goals. We selected goals which we thought might be applicable to our technology and further explored how our technology aligns with the SDGs and how we could implement the SDGs in our ideation process.

We then moved on to assessing how urgent the problems that our technology solved were. This was done using a 2-by-2 matrix which categorised our use cases by urgency and importance. This was a very helpful exercise in helping us to consider the potential impact of our technology. We went on to further utilise the mural for such functions as assessing the fit of our applications, narrowing down and refining our ideas and identifying tests for our prototype.

3. Problem

Medical imaging is a critical part of the healthcare industry with over 200 million medical scans per year. One of the main limitations of medical imaging is the time required to image the patient as well as the limited ability to acquire a live view of the patient. This leads to difficulties during surgery which can cause complications and lead to longer surgery times. In addition to this, surgeons spend large amounts of time preparing by reading medical scans and aligning various scans with the patient’s anatomy.

This means that the healthcare industry suffers from long waiting lists for potentially life-saving surgeries due to the time required for pre-operational medical scans as well as the necessity for surgeons to prepare for operations which is time-consuming and complex. This leads to loss of human life when patients cannot be operated on in a timely manner which is felt most acutely in countries where healthcare resources are felt most acutely. This problem would fall under the sustainable development goal “Good Health and Wellbeing” which was a particular target for our team.

Furthermore, existing medical imaging technologies have severe drawbacks in terms of ionizing radiation, resolution and acquisition time. These drawbacks limit the range of surgeries that can be performed by surgeons and lead to complications during surgery. They are also expensive and require expensive safety and supervision by accredited experts. The drawbacks of these current technologies mean that surgery is more expensive and takes longer leading to a worse patient experience and suboptimal patient outcomes.

Additionally, many current medical imaging approaches are extremely expensive and require dedicated power supplies and utilities as well as extensive maintenance. This means that hospitals are slow to adopt new approaches and technologies due to the high barrier to entry regarding allocating healthcare budgets and the necessity to demonstrate a concrete benefit.

Doctors are also known to be under severe time strain. Reducing the amount of time that healthcare practitioners must spend examining pre-operational medical images has the potential to improve the quality of life for healthcare practitioners, reduce strain on these valuable employees and increase job satisfaction which is currently low in certain medical specialties, particularly those which require high levels of preparation such as surgery.

There is also a dearth of technologies capable of providing high-resolution real-time information during surgery. This leads to a lack of visibility for the surgeon into the patient body during surgery leading to more difficult surgeries as the surgeon cannot see beneath the skin. Additionally, most medical technologies cannot highlight specific areas during surgery which can make it very difficult for surgeons to identify anatomical features in the patient.

Taken together, these drawbacks to current technologies as well as the extensive time required for medical practitioners to examine pre-operational images represent a profound challenge to the healthcare industry. These problems are relevant to the sustainable development goals “Good Health and Wellbeing” and “Decent Work and Economic Growth” due to the fact that they improve both the patient’s and the surgeon's experience.

4. Solution and User story

4.1. Solution

The improvement of medical imaging technology is critical to overcoming the limitations of current systems, which are often time-consuming and costly. To solve these problems, we proposed our solution to facilitate surgical deep tissue imaging - EyeR. Our solution utilizes cutting-edge single-photon detectors to create a multipixel detector system specifically designed for real-time deep tissue scanning during surgery. These detectors, with exceptional sensitivity, are capable of detecting individual photons, enabling the capture of high-resolution images at high levels of detail. By integrating these detectors into surgical microscopes, we aim to revolutionize the way surgeons visualize and navigate the focus during procedures.

As a real-time deep tissue scanner, EyeR collects live images during surgery and channels them through the single photon detector. With the advanced technology of Microquad, the system is able to achieve remarkable precision in both resolution and depth. The captured data is then processed using sophisticated image processing algorithms, which generate real-time deep-tissue scanning results. These results are instantly relayed back to the surgeons, providing them with critical insights that enhance their ability to accurately locate affected areas and exercise greater control during surgery. The EyeR system not only improves the efficiency and safety of surgical procedures but also empowers surgeons with the tools to reduce surgery time.

Figure 2. Prototype for the operation of EyeR

4.2. User story

The user story would be as follows:

1. Discovery and Purchase
    - Research and Decision: The hospital's procurement team identifies EyeR as a solution for enhancing surgical imaging. After a live demonstration and positive feedback from surgeons, they decide to purchase the system.
    - Purchase and Delivery: The EyeR system is purchased and delivered to the hospital, ready for integration.

2. Installation and Setup
    - Installation: EyeR engineers install the system, ensuring it integrates seamlessly with existing surgical microscopes.
    - Training: The EyeR team trains the surgical staff on system operation and image interpretation, ensuring it is for use.

3. Training and tests
    - Training for the surgeons: The surgeons are trained to be familiar with the operation procedure of the system.
    - Off-body tests: Tests are performed so that the surgeons are informed of the expected results and how to maximise their value during the surgery.

4. Real-Time Use During Surgery
    - Live Imaging: During surgery, the EyeR system provides real-time, high-resolution imaging, allowing the surgeon to navigate the focus with precision.
    - Dynamic Adjustments: The surgeon uses continuous feedback from EyeR to make informed decisions, enhancing surgical accuracy and outcomes.

5. Post-Surgery Review
    - Review and Feedback: After the surgery, the team reviews the EyeR data to assess the procedure and shares feedback with the EyeR team for ongoing support and improvements.
    - Ongoing Support: The EyeR team provides maintenance, updates, and troubleshooting to keep the system optimized for future surgeries.

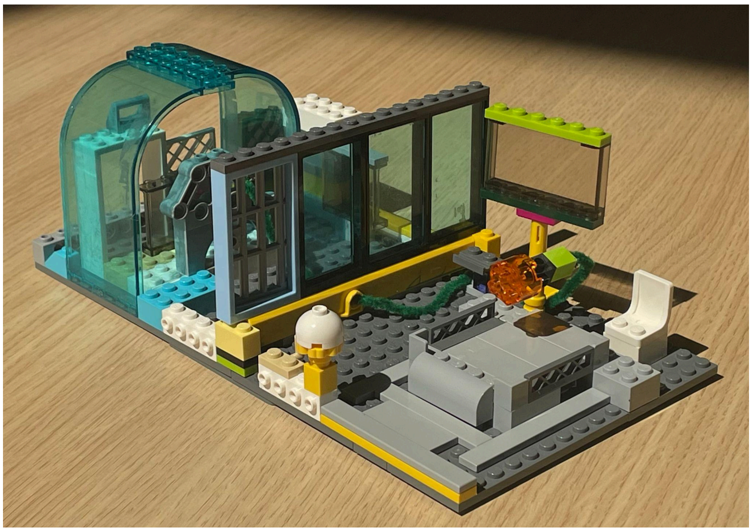

Figure3. Prototype of the system installation in the surgery(front) and operation room(back).

5. Impact (numbers)

The EyeR system, based on Microquad technology, is an innovative tool that can have a significant impact on how surgeries are performed. By providing surgeons with real-time, detailed imaging beneath the skin, EyeR helps make surgeries quicker, less expensive, and safer for patients. Additionally, the benefits extend beyond the operating room, as this technology can positively impact surgeons' work-life balance, allowing them more time to rest and reducing the likelihood of errors. Below, we estimated the potential impact of EyeR, using various approaches to estimate time saved, cost reductions, and improvements in healthcare delivery. All of these calculations are per hospital unless otherwise specified.

1. Time Savings in Surgery

Approach 1: Time Saved Through Improved Surgical Efficiency

Step 1: Estimating the Number of Surgeries Performed Each Year

- **Assumption:** A typical mid-sized hospital performs around 30 surgeries daily.
- **Calculation:**
  - 30 surgeries/day × 365 days/year = **10,950 surgeries per year**.

Step 2: Estimating the Average Length of Surgeries

- **Assumption:** On average, a surgery takes about 2 hours (120 minutes), while more complex surgeries can take between 4 and 6 hours.
- **Assumption:** The EyeR system can reduce surgery time by 10% due to its improved real-time imaging capabilities.

Calculation:

- **For average surgeries:** 120 minutes × 10% = **12 minutes saved per surgery**.
- **For complex surgeries (5 hours):** 300 minutes × 10% = **30 minutes saved per surgery**.

Step 3: Estimating Total Time Saved Annually

- **Assumption:** 80% of surgeries are standard (2 hours), and 20% are complex (5 hours).
- **Calculation:**
  - For standard surgeries: 8,760 surgeries/year × 12 minutes = **105,120 minutes saved annually** (or **1,752 hours**).
  - For complex surgeries: 2,190 surgeries/year × 30 minutes = **65,700 minutes saved annually** (or **1,095 hours**).

Total Time Saved Annually per hospital (through improved overall efficiency): 2,847 hours.

Approach 2: Time Saved by Avoiding Intraoperative MRI Scans

The impact that EyeR can have is significant. Surgeons, who are often overworked, will find EyeR to be a valuable tool for saving time. This extra time can be spent with family and friends, allowing surgeons to rest more and reduce the chance of making mistakes. Moreover, with the time saved, surgeons can perform more surgeries, potentially saving additional lives.

Step 1: Estimating the Frequency of Intraoperative MRIs

- **Assumption:** About 5% of surgeries require an intraoperative MRI to ensure the surgery is proceeding correctly, resulting in around 550 cases out of 10,950 surgeries annually.

Step 2: Estimating the Duration of an Intraoperative MRI

- **Assumption:** Performing an intraoperative MRI, including preparation, scanning, and re-sterilization, takes roughly 1 hour on average.

Calculation:

- **Time saved by avoiding MRIs:**
  - 550 surgeries/year × 60 minutes = **33,000 minutes saved annually** (or **550 hours**).

Total Time Saved Annually per hospital (surgeries that require MRI scans): 550 hours.

Combined Estimate of Time Savings:

- **Total Time Saved (both approaches): 2,847 hours (Efficiency Gains) + 550 hours (Avoided MRIs) = 3,397 hours annually**.

In terms of global impact, if EyeR were used in every operating room around the world, most pre-operative scans would no longer be needed before surgery. Surgeons would perform operations faster because they would have a clear, real-time view of deep tissues. EyeR could save each surgeon approximately 2 hours per week. With an estimated 1.5 million surgeons worldwide, this translates to a total of 3 million hours saved per year globally.

2. Estimating Cost Savings

Step 1: Estimating the Cost of Operating Room Time

- **Assumption:** The average cost of operating room time, including staffing and overhead, is approximately $60 per minute.

Step 2: Calculating Cost Savings from Time Saved

- **Calculation:**
  - **From Efficiency Gains:** 2,847 hours saved × 60 minutes × $60 per minute = **$10.25 million** saved annually.
  - **From Avoided MRIs:** 550 hours saved × 60 minutes × $60 per minute = **$1.98 million** saved annually.

Total Annual Cost Savings: $12.23 million.

These savings are substantial, especially as healthcare systems worldwide face increasing pressure from growing populations and ageing demographics. The money saved can be reinvested in other areas of healthcare, improving overall patient care quality and access.

3. Improvement in Surgical Outcomes

Step 1: Estimating the Reduction in Surgical Complications

- **Assumption:** Approximately 10% of surgeries experience complications, which EyeR could reduce by 15% by providing better imaging and more accurate decision-making.

Step 2: Estimating the Cost of Managing Complications

- **Assumption:** The average cost to manage a surgical complication is around $5,000.
- **Calculation:**
  - Complications avoided: 1,095 × 15% = **164 complications avoided annually**.
  - Savings from fewer complications: 164 × $5,000 = **$820,000** saved annually.

Reducing complications not only saves money but also improves patient outcomes, reducing recovery times and improving overall care quality. Moreover, reducing complications can boost the hospital's reputation, attracting more patients and potentially increasing revenue.

4. Surgeons' Work-Life Balance and Efficiency Gains

Step 1: Estimating Surgeon Preparation Time

- **Assumption:** Surgeons typically spend about 2 hours preparing for complex surgeries by reviewing preoperative imaging and planning.
- **Assumption:** EyeR reduces the need for extensive preparation by 15%.

Step 2: Calculating Time and Cost Savings in Preparation

- **Calculation:**
  - Time saved: 2,190 complex surgeries/year × 0.3 hours = **657 hours saved annually**.
  - Cost savings: 657 hours × $200/hour = **$131,400** saved annually.

Because EyeR saves time during surgeries and reduces the need for pre-operative scans, surgeons will have more time to rest and spend with their families. This improved work-life balance is crucial in a profession known for high stress and long hours. Less overworked surgeons are more likely to make fewer errors, perform more surgeries, and save more lives. As the global population continues to grow, the demand for medical staff increases, making EyeR's efficiency gains even more valuable.

5. Potential Increase in Surgeries Performed Annually

Step 1: Estimating Additional Surgeries

- **Assumption:** Each surgeon saves 2 hours per week with EyeR, allowing them to perform one additional surgery per week.
- **Calculation:**
    - One additional surgery per week per surgeon = 52 additional surgeries per year.
    - If there are 1.5 million surgeons globally: 1.5 million surgeons × 52 surgeries/year = **78 million additional surgeries** performed annually.

This increase in the number of surgeries could have a significant impact on global health, reducing waiting times for surgeries and saving countless lives. The ability to perform more surgeries also means that hospitals can treat more patients, improving access to care and overall health outcomes.

Overall, the benefits include:

- **Time savings: 3,397 hours annually**.
- **Cost savings: $12.23 million annually**.
- **Reduction in surgical complications:** Savings of **$820,000 annually**.
- **Surgeon efficiency gains:** Savings of **$131,400 annually**.
- **Increase in surgeries performed:** Potentially **78 million additional surgeries** globally each year.

Moreover, the broader impact on surgeons' well-being and the capacity to perform additional surgeries could lead to tens of thousands of lives saved each year. EyeR arrives at a critical time when the global population continues to rise and healthcare resources are increasingly stretched. This technology has the potential not only to improve individual surgeries but also to contribute to a more efficient and effective healthcare system overall.

6. Individual Reflection

1. Bas ter Veer

Overall, the CERN Summer School was an amazing experience. It allowed me to meet and work with a large variety of different people from different fields, all of which were hardworking and competent in their own right. The enthusiasm from the organisers was great and being able to visit such an amazing institution like CERN was a once-in-a-lifetime experience. This summer school has truly challenged me in ways I didn't experience before. Working with a group of people with such a diverse range of backgrounds can sometimes be challenging. However, we were able to overcome these differences and ended up with a great and satisfying result.

2. Domen Skerlep

This part will describe my personal reflection on the whole course. In terms of the course structure, at the beginning I expected the course to be very loosely structured with more emphasis on our own approach to the problem. This turned out to be very different the more we progressed in the program. I was quite surprised by the number of techniques that we implemented during the innovation process. The most surprising thing to me, however, was to observe how my mindset has changed throughout the course. It was challenging at first to really try to come up with something truly new. I learned that many factors, including environment, sleep and research truly can affect the ideation process. On some days you can have no ideas at all and on the other one, they come to you instantly. This was something that I might have struggled with at the beginning, but the surprising factor was the exercises that could be used to encourage this ideation process. In addition, meeting new people and bonding with other students in Geneva was truly an invaluable experience that I will never forget.

3. Oza Passot

The CERN IdeaSquare summer school was very inspiring for me in many ways. First of all, I do not often have the opportunity to collaborate on a project with such diverse people. It is always interesting to hear different approaches to a problem and discuss them. The second thing is that we had the chance to meet and work with amazing people from CERN, Ideasquare, TU Delft, etc. Additionally, I would like to add that a struggle of mine was to think of applications outside of academia. Indeed, I am very focused on research applications and it was a tough exercise to come up with societal applications based on our given technology. On top of all that, I would say that summer school brought me valuable skills, such as working together as a group, pitching an idea in front of a crowd, or interviewing experts in a certain area. I am proud of the journey I had together with my team, and hope that EyeR will one day be implemented in hospitals!

4. Patrick O’Donnell

I felt that the CERN IdeaSquare programme gave a fantastic introduction to the world of innovation and entrepreneurship in a really friendly and engaging environment. The extensive guidance given by the organisers, coupled with the emphasis on teamwork lead to a creative and dynamic atmosphere during the programme. The trips to Nihkev and CERN were also invaluable as they brought the entrepreneurial and ideation strategies that we had been introduced to during our time in Delft to life in the real world. In conclusion, this program made me much more likely to engage with the ideation and entrepreneurship process in the future and gave me valuable tools for ideating and innovating which I hope to apply in the future.

5. Zhuoyue Ge

This summer course has been a truly unique and valuable experience for me. Spending a week at IdeaSquare, a vibrant hub of innovation, was both exciting and inspiring. Creative workshops helped us navigate the entire ideation process, from brainstorming initial concepts to developing prototypes and delivering pitches. One of the highlights was the opportunity to interact with CERN professionals and experts from various fields. Their insights into their work and how our ideas might fit into their world were enlightening.

Collaborating with students from diverse backgrounds was a brand new experience, which allowed me to approach problems from different perspectives and learn from others' insights. Despite the challenges and disagreements we faced along the way, we ultimately found an application we are all proud of. Overall, I truly enjoyed the time spent at IdeaSquare and the unforgettable moments in Geneva.