Research Proposal

Overall research topic:
The potential applications of XR (extended reality) in communication, learning, and mental health.

Research questions:
Below I structure the research questions based on the areas of interest.
Communication applications:

- How can the usage of XR modify and potentially improve the ability between two individuals to converse about ideas?
- Can socialisation in XR act as a suitable alternative to socialisation in person, and is it better alternative to socialisation than video calling?
- Do individuals enjoy socialising in XR as much as in real life and what implications does this have for the future?

Learning applications:

- Can the process of learning be meaningfully improved via the usage of XR? Can students become more engaged in learning with XR content in comparison to a traditional learning environment? For example, by medicine students preforming virtual dissection?
- Using learner analytics, can we hypothesise how best to use XR to improve education? Based on time spent in XR, examination scores, the influence of XR on student mental health and other variables?

Mental health applications:

- Can XR specific meditations and environments reliably stimulate the central nervous system in order to improve the concentration and alertness of individuals?
- Can exercise and movement in XR act as a suitable alternative to how exercise and movement is usually conducted?

Objectives:

- Monitor the communications between individuals in XR; this includes analytics of conversations, as well as other interactions
- By conversing with psychologists and via the usage of data analytics, to understand the effects on XR on these communications
- Hypothesise the potential of these effects on society in the coming future
- Investigate how the learning process of students can be augmented by XR
- Evaluate if, how and why the learning process can be meaningfully improved via the usage of learner analytics
- Investigate the calming and stimulating effects that XR can produce when paired with meditation
- Investigate whether exercise in XR can be a suitable alternative to standard exercise

A summary of the project

I would like to conduct research in the possible applications of XR (extended reality) in communication, learning and mental health. XR encompasses all real-and-virtual combined environments and human-machine interactions generated by computer technology and wearables (Augmented, Virtual and Mixed Reality – see Wikipedia). As XR becomes widely available and developed over the next decades it has the potential to massively influence and improve our lives across many areas.

According to the 2019 Augmented and Virtual Reality Survey Report presented by Perkins Coie (2019), a leading international law firm, 86% of respondents including start-up founders, executives in established technology companies, investors and consultants, agreed that by 2025 VR and AR (virtual and augmented reality) devices will be as widespread as mobile devices. The survey respondents chose education as joint second most applicable industry for XR.

Whether watching 360° movies, playing games, walking through 3D models of the buildings, travelling through the universe, or any other immersive experiences, XR devices create the illusion to make people feel as if they are in an entirely new digital world (O'Donnell, 2018). An example of this immersion is AltspaceVR, an online XR social platform hosts events ranging from comedy clubs, meetups, classes, meditations, parties and more. I would like to investigate some of these application areas of XR using data analytics with help from mental health experts to better understand how these potential influences will shape society and how best to use this technology for society's benefit.

Also, I would like to investigate XR from a research perspective to understand how best to academically study it I.E., what research challenges and directions it includes. I believe that this is necessary and important to consider so that research conducted is productive.

The devices I need for this research are to be available in the new SCENE lab headed by Prof. Cristea in the new Computer Science and Maths building at Durham. Importantly, the research can be also performed online and builds upon some of the lessons learnt during the move to online interaction during the COVID-19 pandemic – however, it represents the next step from 'simple' online interaction towards possible avenues for our future.

References:

Extended reality - Wikipedia

Perkins Coie, 2019, https://www.perkinscoie.com/images/content/2/1/v4/218679/2019-VR-AR-Survey-Digital-v1.pdf

O'Donnell, D. (2018) Driving Immersive Experiences in Virtual and Augmented Reality [online] https://blog.westerndigital.com/driving-immersive-experience-virtual-augmented-reality/ (accessed 15 Jan 2021).

AltspaceVR, https://altvr.com/