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Virtual and Augmented Reality for Positive Social Impact

Kate Ferris

School of Computing and Information Systems, The University of Melbourne
Melbourne, Australia
kferris@unimelb.edu.au

Ryan M. Kelly

School of Computing and Information Systems, The University of Melbourne
Melbourne, Australia
ryan.kelly@unimelb.edu.au

Ross Brown

School of Electrical Engineering and Computer Science, Queensland University of Technology
Brisbane, Australia
r.brown@qut.edu.au

Greg Wadley

School of Computing and Information Systems, The University of Melbourne
Melbourne, Australia
greg.wadley@unimelb.edu.au

Steven Baker

School of Computing and Information Systems, The University of Melbourne
Melbourne, Australia
steven.baker@unimelb.edu.au

Jenny Waycott

School of Computing and Information Systems, The University of Melbourne
Melbourne, Australia
jenny.waycott@unimelb.edu.au

Eduardo Velloso

School of Computing and Information Systems, The University of Melbourne
Melbourne, Australia
eduardo.velloso@unimelb.edu.au

Selen Türkay

School of Electrical Engineering and Computer Science, Queensland University of Technology
Brisbane, Australia
selen.turkay@qut.edu.au

ABSTRACT

This workshop invites researchers and industry practitioners designing Virtual Reality and Augmented Reality applications for positive social impact to join us in Perth, Australia, to discuss the research and industry landscape and identify opportunities for collaboration with like-minded professionals. Participants will have an opportunity to share their experiences with other attendees, and will discuss the challenges they have experienced in working with VR and AR applications. This workshop will aim to help researchers to overcome these challenges and, as an outcome, plans will be made for future workshops to establish and promote positive social impact as a long-term research focus for VR and AR researchers in Australasia.

CCS CONCEPTS

• **Human-centered computing** → **Virtual reality; Mixed / augmented reality.**

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KEYWORDS

Augmented reality; Positive social impact; Virtual reality

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1 INTRODUCTION

This workshop aims to explore how designers can create positive social impact using Virtual Reality (VR) and Augmented Reality (AR) technologies. VR has been defined as a “medium composed of interactive computer simulations that sense the participant’s position and actions and replace or augment the feedback to one or more of the senses, giving the feeling of being mentally immersed or present in the simulation” [11]. By contrast, Augmented Reality (AR) has been defined as “a medium in which real-time interactive digital information is overlaid on the physical world that is in both spatial and temporal registration with the physical world” [11].

Both Virtual Reality and Augmented Reality (hereafter referred to as ‘VAR’) technologies have developed rapidly in recent years and are now highly accessible to both research and industry. VR is becoming more affordable and

more portable with the release of untethered devices such as the Oculus Go in 2018 and Oculus Quest in 2019 [3]. These devices make research and evaluation of VR applications in the field much simpler. In industry, many organisations and individual developers have noticed VAR's attraction for the public and have developed immersive experiences targeting greater engagement and positive social impact in relation to topics including climate change, public health and education [5, 8, 10].

These developments mean that organisations have moved rapidly to adopt and deploy VAR with relatively little research guidance. However, there is a need for structured and focused research to help provide a solid evidence base for using VAR to achieve social impact. For example, organisations including the United Nations and World Bank have used VR in high-level decision-making meetings, but the nature and extent of its social impact is unclear [6, 7, 9, 12]. In Australia, organisations such as the Australian Conservation Foundation and Indigilab are also engaged in creating VAR content aimed at positive social impacts [4, 5] and could benefit from research partners to provide ongoing research support. Researchers in HCI are in an ideal position to undertake structured design and evaluation which will help to guide and assess the positive social impacts that VAR may bring to real-world problems such as climate change, health and wellbeing, education and training.

The rapid development of the VAR technology landscape has provided an immense opportunity for partnerships between industry and research. The mobility and accessibility of these devices has also opened the gates for more interdisciplinary work. This workshop seeks to explore the existing trends in VAR research and industry, extend previous workshop outcomes on VAR for 'good' [1, 2] and provide opportunities for local industry and researchers to come together for positive social impact initiatives.

Broad Goals

- (1) Explore the landscape of current research and practice in VAR for positive social impact.
- (2) Bring together diverse community members working in VAR technologies for positive social impacts.
- (3) Discuss the use cases in which VAR technologies are likely to be impactful (What does VAR bring over and above other technologies, and what are the mechanisms that make it useful for positive social impacts?).
- (4) Understand the challenges and potential solutions in VAR research and practice in this area.
- (5) Foster discussions and potential collaborations between research and industry.
- (6) Ask how HCI can best provide research support to organisations already developing these technologies in terms of human-centred design and evaluation.

- (7) Discuss practical questions around implementing VAR.

2 WORKSHOP PARTICIPANTS

This workshop invites researchers and industry partners to come together and discuss using Virtual and Augmented Reality technologies for positive social impacts. A welcome invitation is especially extended to indigenous designers, developers, research and industry partners.

Paper Submissions

We invite researchers and industry partners to submit a one-page paper that addresses one or more of the following:

- What are you working on in VAR and how does your work aim to achieve positive social impact?
- What are some challenges you are facing?
- How will you measure/evaluate positive social impact?
- If you are seeking industry partners, what type of industry partners are you seeking?
- If you are seeking research partners, what research are you looking for to support your work?

Submissions to the workshop should follow the OzCHI template, using the SIGCHI layout. More information about templates, and how to submit your paper, can be found on our website: <https://varforpositivesocialimpact.wordpress.com/>

3 FULL DAY WORKSHOP SCHEDULE AND ACTIVITIES

Table 1 shows our planned schedule of events. This schedule will be adjusted according to the number of submissions accepted to the workshop.

Participants are encouraged to bring examples of their work to the workshop. Please bring any hardware (preloaded with your VAR experiences) required for others to experience. We plan to bring an Oculus Go and HTC Vive to demonstrate new experiences in the area. If your app runs on one of these platforms, there is no need to bring hardware.

Room Requirements

For the workshop, we require a projector and a laptop/PC. The room should have capacity for 20 people.

4 POST WORKSHOP PLANS

Outcomes from the workshop will include:

- A summary document provided to all participants.
- A permanent website hosting all accepted submissions.
- An overview article of current progress and challenges in using VAR for positive social impact submitted to ACM Interactions or a similar venue.

Table 1: Planned Schedule of Events for the Workshop.

9:00–9:10	Welcome address and outline of the schedule
9:10–9:40	Invited talk 1 – An industry expert in VAR (Focusing on current landscape of practice in VAR for positive social impact)
9:40–10:40	Paper sessions 1 - Presentations of what people are working on, the challenges they are experiencing and how they plan to measure/evaluate positive social impact in their work (20 minutes per talk).
10:40–11:00	Tea/Coffee break
11:00–11:40	Paper sessions 2 - Presentations of what people are working on, the challenges they are experiencing and how they plan to measure/evaluate positive social impact in their work (20 minutes per talk).
11:40–12:40	Demo Session - View discussed experiences (participants to bring their own hardware for this session) or new release experiences.
12:40–13:40	Lunch
13:40–14:10	Invited Talk 2 - A research expert in VAR focusing on the current landscape of research in VAR for positive social impact.
14:10–15:50	Paper Sessions 3 - Presentations of what people are working on, the challenges they are experiencing and how they plan to measure/evaluate positive social impact in their work (20 minutes per talk).
15:50–16:00	Tea/Coffee Break
16:00–16:45	'Around the campfire' feedback and final thoughts: Group discussion around a virtual campfire on possible solutions to challenges faced and general feedback on the experiences viewed.
16:45–17:00	Finish and plans for the next workshop at OzCHI 2020.

5 WORKSHOP ORGANISERS

Kate Ferris is a PhD student at the University of Melbourne's Interaction Design Lab. Her research is exploring the development and evaluation of Virtual Reality technologies for persuasive climate change communication. She has a background in psychology and global public health and has worked professionally on psychological and public health research projects and in ethics in university settings.

Ryan M. Kelly is a Research Fellow in the School of Computing and Information Systems at the University of Melbourne. He is interested in using virtual and augmented reality to support human health and wellbeing. His previous work includes an investigation of virtual reality for mindfulness practice and a study of how augmented reality games can stimulate social interaction in public spaces.

Ross Brown is a Senior Lecturer within the School of Electrical Engineering and Computer Science, QUT, where he is a member of the Computer Human Interaction discipline. His main research interests are in immersive technologies such as VR and AR. He seeks to understand how immersion and presence influences humans. In short, his research question is: "How can VR or AR environments enhance human cognition?". He is researching the use of such systems in intellectual disability training, business process elicitation, training and modelling, and environmental knowledge elicitation.

Greg Wadley is a Senior Lecturer in the School of Computing and Information Systems at the University of Melbourne, where he designs and evaluates technologies for health and wellbeing. He is collaborating with psychology researchers to design VR interventions in youth mental health programs.

Steven Baker is a Research Fellow at the Interaction Design Lab at the University of Melbourne. His research interests centre around how technology can be used to support human flourishing and benefit disadvantaged groups. Steven's doctoral research focussed on the use of tablet computers by older adults who had histories of homelessness, social isolation and complex needs. This interest in older adults and technology extends to his work on the Ageing and Avatars ARC Discovery project which focusses on how social virtual reality and avatars can enable older adults to participate in meaningful social activities. In addition to his work with older adults, Steven is also involved in projects assessing the potential of virtual reality to support people living with a disability, assessing assistive technology use by blind and visually impaired adults in the workplace, and the use of echolocation to navigate virtual worlds. Steven combines his academic interest in human-computer interaction (HCI) with professional experience as a social worker.

Jenny Waycott is a Senior Lecturer and ARC Future Fellow in the School of Computing and Information Systems at the University of Melbourne. Dr Waycott has contributed to several projects in the fields of human-computer interaction and educational technology. Her research is concerned with understanding the role technologies play in people's learning, work, and social activities. Her recent work has focused on the design and use of social technologies for/with older adults, ethical issues in the design and use of new technologies in sensitive settings, creative uses of new technologies

for social inclusion, and the use of social technologies in higher education.

Eduardo Velloso is a Senior Lecturer in Human-Computer Interaction and a Discovery Early Career Researcher Award Fellow at the School of Computing and Information Systems at the University of Melbourne. His practice and research focus on interaction design for emerging technologies. He is interested in the novel user experiences that are enabled by the combination of novel input and sensing modalities, the design of new interaction devices and techniques, and the use of artificial intelligence and machine learning in interactive systems.

Selen Türkay is a Lecturer in Computer Human Interaction at Queensland University of Technology. Her research interests include design of personalized, interactive, and multiuser environments, with a focus on games and immersive realities. Specifically, she studies the effects of design choices on users' cognition and affect.

REFERENCES

- [1] Ross Brown, Selen Turkay, and Laurianne Sitbon. 2018. Educational Virtuality: Cognitive Benefits, Design Processes and New Frontiers. In *Proceedings of the 30th Australian Conference on Computer-Human Interaction (OzCHI '18)*. ACM, New York, NY, USA, 620–622. DOI: <http://dx.doi.org/10.1145/3292147.3295498>
- [2] Arindam Dey, Mark Billinghurst, Gregory Welch, and Edgar Rojas-Muñoz. 2018. 3rd Virtual and Augmented Reality for Good (VAR4Good) Workshop. In *2018 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)*. IEEE, 364–364.
- [3] Lauren Goode and Peter Rubin. 2019. Oculus' \$399 Quest to Take VR Mainstream. (2019). <https://www.wired.com/story/oculus-quest-wireless-vr-headset/>
- [4] Indigital. 2019. Culture: In Digital. (2019). <https://www.indigital.net.au/>
- [5] Thomas Kinsman. 2019. Daintree: A Nature Legacy Experience. (2019).
- [6] United Nations. 2017a. COP23: UN Climate Change Conference. (2017). <https://www.un.org/sustainabledevelopment/cop23/>
- [7] United Nations. 2017b. The Ocean Conference. (2017). <http://unvr.sdgactioncampaign.org/ocean-conference>
- [8] Oculus. 2019. VR for Good. (2019). <https://www.oculus.com/vr-for-good/>
- [9] Tom Perry. 2018. Completing the storytelling 'circle': a VR project goes home. (2018). <http://blogs.worldbank.org/eastasiapacific/completing-storytelling-circle-vr-project-goes-home>
- [10] Project Empathy. 2019. Available Online. (2019). <https://www.projectempathyvr.com/>
- [11] William R. Sherman and Alan B. Craig. 2018. *Understanding virtual reality: Interface, application, and design*. Morgan Kaufmann.
- [12] World Bank. 2018. Fiji's climate change story in virtual reality. (2018). <http://www.ourhomeourpeople.com/>