Augmented Realities, Spatial Perception and Societal Impacts

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Digital media shape our perception of spaces, e.g., by mapping and mobile navigation systems that structure our geographic reality, through augmented reality (AR) games, social media that floods us with news, customized advertisements or geo-tagged photos, videos, and comments about places of interest. Additionally, online and offline realities increasingly converge as AR technology evolves and spreads.

There is however a wide research gap on how the use of AR affects individuals and society at large. For instance, how do digital media and AR change individuals' perception of space? Which values drive AR development and use and how do these manifest? What are potential scenarios of AR propagation and pervasiveness? What are possible impacts of AR use on society and the environment? Which methods are suitable for investigating the use of AR and its impacts? Is there a need for regulation and what are the ethical considerations of this development?

The Digital, Affects and Space: Methodological Advances in Researching the Relation of Augmented Realities, Spatial Perception and Societal Impacts

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How does a Twitter tweet, a Facebook post or a YouTube video shape how we feel about a public park? And what if we consume such media content in real-time and on-site using augmented reality technologies? How would this augmented reality change the way we use public places, feel about security, interact with others and how would it ultimately affect the cohesion of society? This paper introduces first findings of the DigitAS project ("The Digital, Affects and Space", ÖAW Go!Digital funding), which seeks to tackle these questions through developing, testing, triangulating and comparing digital, bio-sensing and qualitative methodologies.

People's involvement in the digital media, especially since Web 2.0 and the latest developments in virtual and augmented reality technologies, is manifold and increases the complexity of their perception of the world. While social media platforms have extensively been researched including the development of web-native techniques under the notion of "digital methods" (Rogers, 2013), there is a lack of methodologies that are able to adequately grasp the effects of people's engagement with the digital on their affective-emotional experiences of spaces.

DigitAS seeks to advance methodological avenues for researching the effects of an increasing interlacing and interdependence of online and offline spaces in augmented reality settings. It pays special attention to researching the effects of humans' engagement with the digital sphere on their subconscious affective and conscious emotional experiences of space. With the selection of test sites comprising highly debated public places in Austria as research settings, DigitAS will gain insights into the production of place through the increasingly interwoven digital and offline spheres in the context of Austrian urban areas. Expected outcomes beyond the period of the project are the establishment of DigitAS Lab as emotions sensing and mapping infrastructure for consecutive projects, research, education and collaboration in Digital Humanities and beyond. In the mid-term, DigitAS aims at co-

creating knowledge on possible and desirable futures for development, application and governance of augmented reality technologies.

Extending reality. On the impact of augmented reality in the Netherlands

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Augmented Reality (AR) is quickly making inways in the consumer market and taking leaps in terms of technical development. The last few years tech giants such as Google (Google Glass), Microsoft (HoloLens) and North (Focals) have invested billions in the AR industry which has led to an improvement of graphic quality, device size and price so that the technology has become within reach of the masses. Although there is currently a lot of focus on the technical development of AR, in the Netherlands we signal little attention for the ethical and social issues surrounding it. Academics (such as Lemley and Volokh, 2018; Spiegel, 2018, and Cornet et al., 2019) show that AR comes with many existing technological issues but also poses new questions surrounding privacy, surveillance capitalism, and public space. A body of scientific literature is currently emerging on these issues, although we see that the subject is underexposed in public and political discourse. Therefore, in this paper we carry out a systematic literature review and present a framework of ethical and societal issues surrounding the introduction and upscaling of AR in the Netherlands. Also, we present use-cases of successful application of AR in domains such as healthcare, justice and manufacturing in the Netherlands to explore these ethical issues in context. Finally we give an overview of regulatory measures that could be taken to mitigate the risks of AR. Phenomena such as Google Glass and Pokemon Go have shown us that AR developments can take policymakers by surprise, and therefore we aim to present an agenda on how AR can be used in a socially responsible manner by companies, policymakers, politicians and citizens.

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