The 360° Video *Secret Detours* as Case Study to Convey Experiences through Immersive Media and the Method of Presentation

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Abstract

Our recent work *Secret Detours* served as an immediate approach to digitally preserve a Chinese garden in Singapore and has been conceived as an immersive 360° video. We have investigated several different presentation modes in order to explore the screening possibilities. The constraints and limitations of each mode has necessitated a reconfiguration of visual and audio composition. The experience of the work and the aesthetic and technological decisions that informs it, varies significantly, depending on whether the work is collectively viewed in a hemispherical dome, a cylindrical panorama, a panoramic LED video wall or with a range of different VR headsets.

Secret Detours

Secret Detours was filmed with 360° spherical video in a Chinese garden in Singapore, which opened in 1956 – fairly old for the 53 years old city state. The garden is currently undergoing massive re-development, several old trees were logged, bridges and pavilions were removed. As it was important to act fast, myself and, my two collaborators, Benjamin Seide and Ross Williams, decided to capture the garden with 360° imagery, not only for artistic purposes but for conservation reasons as well. Four dancers acted out a choreography to represent the cardinal directions of Chinese Mythology, after which the garden was initially conceived.

Fig 1. *Secret Detours*, 2018, Reinhuber, Seide, Williams
Forking paths in the south-east of Yunann Garden, represented by the dancers dressed in vermillion and azure. 360° video in equirectangular projection on a flat screen.

Although the visualization gives an impression of being inside the garden, it is still a very static experience and therefore, we are currently working on a room scale model for VR, based on photogrammetric assessments to restore the garden according to the floor plan in the virtual space.

Fig 2. Different to the immersive experience in a surrounding projection, the dancers on the planar panoramic video wall *NEXUS* accompany passers-by.

Fig 3. Larger than life-size presentation in the *Digitalis* dome with one projector invites the viewer to sit down and observe.

However, considering the respective iterations we already produced, the perception of the 360° screenings differs hugely, depending on the particular presentation technique. Since the technology around spherical recording and displaying is still in flux, due to the rapid developments and along with particular improvements by the industry, competing for market penetration.

Fig 4. Presentation of Secret Detours in a 7 metre *Fulldome* with four HD projectors.

For 360° media, the facilitation of viewing techniques has only just began. After Morton Heilig's and Ian Sutherland's first approaches with ray-cathode tubes in front of the user's eyes within a bulky set up, the facilities today range from DIY cardboard solutions, which immensely popularized the medium to high-end immersive environments. In particular stand-alone headsets for 360° media (including stereoscopic viewing experiences) appear to be a promising solution, even when the obvious limitations have to be contemplated. Sound presentation is similarly affected with little standardization in channel configuration (outside of cinematic presentations) and the ever present issue of variable room acoustics and ambient noise. The recent resurgence of ambisonics and binaural techniques for headphones in VR offer a way to mitigate some of the standardization issues mentioned, but not without limitations.

Fig 5. The shared experience of viewing *Secret Detours* in a cylindrical panorama – the ideal set up for the mobile spectator.

Table 1:
Current screening formats of Secret Detours.

	Resolution			Audio
	Width in px	***Height in px***	***Geometry***	
Original footage	***7680***	***3840***	***equirectangular***	***mute***
VR headset	***7680***	***3840***	***spherical***	***Binaural***
Cylindrical panorama	***5248***	***608***	***cylindrical***	***8 channel***
Panoramic LED video wall	***3840***	***480***	***planar***	***5.1***
Fulldome	***2048***	***2048***	***hemispherical***	***5.1***
Mini-Fulldome	***1200***	***1200***	***hemispherical***	***5.1***
Flat Screen, *VLC, GoPro or YouTube*	*screen resolution*		***planar, scrollable***	***Binaural***

Biography

Elke Reinhuber, Benjamin Seide and Ross Williams currently teach and research in Media Art at ADM, School of Art, Design and Media at NTU Singapore. With their experience and expertise in the areas of sound design (Williams), special effects and imaging (Seide) as well as camera and concept (Reinhuber), they explore the fascination and possibilities of immersive media from different points of view, especially in regard to representations of culturally relevant subjects.