Impact Case Study

UoA 34: Art and Design

<u>**Fairy Magic (2012)**</u> **(Professor Greg Maguire)**

Professor Greg Maguire's research at Ulster University led to the design and implementation of an innovative augmented reality iOS application that introduced cinematic rendering and interactive narrative to a mobile phone or ipad app. '*Fairy Magic*' is an iOS application that explores human and character interaction through augmented reality. Fairy Magic can be downloaded from the app store and won the Gaming category of the ITLG Silicon Valley awards in 2012.

Fairy Magic leveraged Professor Maguire's extensive experience in game design, visual effects and animation to bring to mobile a quality of characterisation, interaction and technology that is usually the reserve of console games and film effects. Maguire's research developed new visual quality and reached new audiences. Fairy Magic enables the player to use their iPhone, iPod touch or iPad as a lens through which fairies hidden in the world can be found. Players can collect over 50 unique fairies across 7 different "fairy clans", discover their names, and play simple games with them. Fairies can be photographed indoors or outdoors, with the game lighting adapting to the surroundings.

Augmented reality supplements real-world experience by placing graphics over a live camera feed in real-time. Smartphones are widely used, portable and equipped with sensor features, making them an ideal and popular device. However, embedded industry practices delivered an inferior experience that limited adoption. Ulster University research informed integration and implementation of visual effects enabled a high-end cinematic experience on a mobile phone or ipad. This included integration of user's environment, interaction with characters, motion blur, 3D realistic character, facial animation, exponentially increased capacity for customised narrative and new audiences.

Character based applications on smartphones have been captivating audiences world-wide, since their introduction. Maguire recognized that the novelty will eventually diminish as audience sophistication and expectations increase. His research aimed to widen emotional vocabulary and increase realism. In this way Fairy Magic also reached new audiences, far beyond the typical user of games.

Maguire developed new ways to replicate film industry effects using untapped real-time capabilities of the smartphone to create more appealing and engaging visuals. He used techniques appropriated from film that others deemed too computationally expensive for mobile by developing new ways to achieve the visual properties of the cinema on a portable device.

Maguire employed his own research into the use of the Facial Action Coding System (Ekman, Friesen, 1978) in animation for film to create a system that enabled every facial movement possible in the mobile application, Fairy Magic. Other impact from Maguire's research includes work with industry leaders such as George Lucas's Emmy Award-winning Star Wars: The Clone Wars. This 3D CGI animated television series averaged 3 million total viewers in its debut and became most-watched series premiere in Cartoon Network history. Nvidia Corporation is a US based global technology company in California- their GPUs are in most of the world's smartphones. Nvidia used Maguire's research of Real-time facial movement in **'New Dawn'** to demonstrate the capability of their new Titan GPU.

In existing augmented reality applications the graphic layer placed over the camera had no cogniscience of the background. In Fairy Magic, Maguire researched how to light real-time characters with an unpredictable background scene by replicating Image Based Lighting.

He investigated three existing techniques to replicate motion blur on fast moving objects. 1) real-time graphics delivery on desktop PCs, 2) Monte- Carlo stochastic sampling in rendering for film, and 3) traditional 2D Cel animation. His innovation drew on these unconnected practices to deliver on a method to mimic motion blur on mobile devices for repetitive motion

Fairy Magic provided a great opportunity to research the cutting edge of story-telling with a portable device that had a touchscreen, GPS, an accelerometer, a gyroscope and a front and rear facing camera and the potential to reach a wider audience. Perhaps creating a more intimate experience could be created with an audience of one instead of a shared cinema experience.

Greg Maguire accepting the Irish Technology Leadership Award for Best Game at the Innovation in Entertainment Summit at Sony Pictures, Holywood, USA.