CEIG 2017

Conferencia día 28

Conferenciante:	**Carol O'Sullivan**
Título:	The perception of physical interactions in Mixed Reality
Referencia:	https://www.tcd.ie/research/profiles/?profile=osullica
Horario:	10:00-11:00
Resumen:	Causality is perceived when it can be seen that an event causes a particular response to occur. When errors in the laws of physics are perceived, the event no longer appears to be plausible to the viewer. Take the example of a recent augmented reality game for phones: Pokemon Go. When a user "throws" a virtual pokeball, it either hits or misses a virtual target overlaid on the real world. However, there is no physical interaction between the ball and the real world. Now consider playing a similar game in Mixed Reality: the user perceives that the virtual ball is really in her hand; when it is thrown she feels that the forces she has exerted have caused the resulting motion of the ball; When she hits the virtual target or misses and hits a real object, she perceives its response as physically plausible. In this ideal setting, the perception of causality has been maintained. Such experiences in Mixed Reality have not yet been achieved, and in this talk the challenges of doing so will be discussed along with an overview of our previous research results that could help.

Conferencia día 29

Conferenciante:	**Anna Vilanova**
Título:	Visual Analysis using Dimensionality Reduction
Referencia:	https://graphics.tudelft.nl/anna-vilanova/
Horario	13:00-14:00
Resumen:	Large amounts of information are constantly being collected. The analysis of this data has the potential to provide new discoveries. However, the high-dimensionality and complexity requires new analysis tools to fully exploit the potential of the data. Visual analytics is a branch of visualization that focuses on the science of analytical reasoning facilitated by interactive visual interfaces. Visual analytics can also be seen as an extension to data mining and pattern recognition methods that do most of the data analysis without inspecting the data. It is also a complement to the already existing visualization techniques by the introduction of concepts of reasoning and data mining. Interactivity is a major factor on Visual Analytics. Often data mining techniques need large processing times that limit the applicability of the methods. One key method for data analysis is dimensionality reduction methods such as t-Distributed Stochastic Neighbor Embedding (tSNE). I will present our recent work that introduces extensions and improvements to this algorithm to facilitate its inclusion of Visual Analytics systems. We introduce a controllable tSNE approximation, which trades off speed and accuracy, to enable interactive data exploration. We grant the analyst the ability to change algorithm parameters, to insert and remove data-points and features in a fully interactive way. In order to deal with high amounts of data, we also present a Hierarchical extension of the tSNE that facilitates the analysis of large amounts of data at different levels of detail. Biomedical applications will be used as illustrations of the methods presented.

Conferencia día 30

Conferenciante:	**Marcos Fajardo**
Título:	Arnold and How Path Tracing Took Over
Referencia:	https://www.solidangle.com/about/
Horario	13:00-14:00
Resumen:	Monte Carlo path tracing is now the standard rendering approach in film VFX, animated films, commercials and pre-rendered video game intros. The Arnold renderer from Solid Angle played a significant role in the transition from rasterization-based technology. In this talk Marcos Fajardo will provide some historical context on how studios made this transition and describe the key benefits that motivated it. Marcos will also discuss some of the latest developments in the Arnold renderer as well as the challenges that still lie ahead in the never-ending quest for increased detail and visual realism.