

Network Institute Tech Labs

Newsletter Spring 2016

It's that time of the year again. A new Newsletter giving you some juicy details on exciting research going on in the Tech Labs. This year it's been really busy, so plenty to tell. Just like in the real world out there, Virtual Reality is starting to gain more and more momentum in research and the Tech Labs offer plenty of possibilities. Of course there's more to the world than VR, and the Tech Labs are still the place to be if you need any support using state-of-the-art technology in research or education.

If you need to get in contact with the Tech Labs, please email Marco Otte (m.otte@vu.nl) or look at the Network Institute website: www.networkinstitute.org.

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Research

Virtual violence that feels real?

What will the ability to feel your surroundings contribute to virtual reality simulations and games? Will we be able to learn more efficiently using haptics? Will virtual reality feel more like reality?

This research will look into the effect haptics have on the behavior and physiological response of a user while they interact with a virtual agent. During the experiment users will wear a Head Mounted Display (Oculus Rift) and a Haptic Feedback vest (Kor-FX).

The Tech Labs made the virtual environment including all the avatar animations and interactions. We also hacked the Kor-FX to make it accessible to the Unity Pro C# coding.

Researchers: Linford Goedschalk, Tibor Bosse



Enhancing the experience of art using VR and Head-Mounted-Displays

The aim of this project is to examine a different way of presenting art to visitors of the Rijksmuseum.

Using a virtual environment and the Oculus Rift head-mounted-display (HMD), a user transported to any environment. This makes it possible to show museum visitors art objects in their 'natural environment', instead of inside the museum. This way the visitor will get an enhanced experience of that art object.

In this project a shield decorated with an Andreas cross and four sparks from a knight of Burgundy is used.

The shield is placed in a medieval village from the same period and is brought to life with wandering medieval people and animals. A female avatar tells the story of the shield to the visitor.

In this project we hope to see if an HMD brings any added value compared to showing a video of the VR on a tablet. In addition, we hope to see if the medieval village as environment brings any benefit compared to a neutral environment. Finally, we hope to assess any benefit of using a VR with HMD on showing and experiencing art.

The actual research will take place in the Rijksmuseum, where visitors will be able to choose to participate.

After experiencing the VR, participants will be asked to fill-out a survey.

The Tech Labs created the virtual environment, including all the avatars and animations.

Reseachers: Denice Tuinhof, Johan Hoorn



People on the Screen

Watching television is still very popular among media users. Consequently, many different television programs are broadcasted everyday. While watching these television programs, people are exposed to TV presenters and actors who seemingly communicate with them. It has been argued that viewers sometimes react upon these TV performers in a similar way as they would react upon people in a face-to-face situation.

This study investigates viewers' conscious and nonconscious reactions to people on the screen, and examines whether or not these reactions are similar to reactions in face-to-face situations. Physiological measurements will be used to analyze physiological responses, and subjective feelings and thoughts will be assessed by means of a self-report questionnaire.

The Tech Labs helped by supplying the heart rate and skin response sensors, the computers and the lab space. Afterwards the Tech Labs will also help analyzing the heart rate and skin response data.

Reseachers: Linda Kooijman, Tilo Hartmann

Testing presence in VR

This study focuses on understanding more about virtual reality. More specifically, we are interested in discovering what factors in a virtual reality environment affect our perception of presence. Presence is the feeling of actually being in the environment that you are observing in virtual reality. Using Oculus Rift technology,

we will have participants come in to explore a virtual house. While exploring, participants will be asked to press a button whenever they notice something that makes them remember they are back in the lab, and not actually in the house they are exploring. Utilizing different conditions (a realistic house versus and a house in which unrealistic elements are present), we will be able to further understand what cues our brains pick up on when distinguishing reality from virtual reality. Participants will be asked to comment on what elements reminded them of their actual location while reviewing a video of their exploration of the house. As virtual reality becomes more influential and popular in today's society, our research will prove to be useful for understanding how we as humans cope with this new technology.

The Tech Labs enhanced the existing virtual environment to suit this specific research.

Researchers: Ana Alhoud, Allison Eden, Tilo Hartmann



Harassing virtual humans

It is expected that the overall VR market will grow to 895 million dollars in 2016 and it will rise considerably during the next 4 years. One of the 'benefits' of the VR is that the experience of presence in a virtual environment is perceived much higher than based on the regular screen.

However, this also raises questions. One of the biggest market segments in gaming is that of violent video games. Games like Grand Theft Auto or Call of Duty contain a lot of violence. One of the big discussions nowadays is the effect of these violent video games, when they are played with a device - like the Oculus Rift - that makes it more realistic. Does it make you more aggressive when you encounter violence? Or do you feel more guilt?



This experiment features a realistically looking setting in a bar, in which participants will encounter and engage in violent conduct against a non-violent virtual female character. The participants will either be playing on a computer screen or with the Oculus Rift VR technology. To check whether the display modality has an influence on the emotions, level of aggression, feeling(s) of presence and the level of arousal, the subjective feelings and thoughts of the participants are assessed based on a self-report questionnaire.

The Tech Labs created the virtual environment including all the avatars, animations and interactions.

Researchers: Jordy den Hollander, Tilo Hartmann

Quick News

Internship at the Tech Labs

Hello my name is Colin. I'm a second year student at the HVA (Hogeschool van Amsterdam) and I'm studying Communication Multimedia Design. My goal is to become a top frontend developer and at the moment I'm an intern at the Tech labs of the Network Institute. I'm in my second year and I had to find a workplace where I could be an intern for 8 weeks. After visiting the Tech Labs I decided that it would be a good experience and I was asked on what kind of projects I would like to be working on. So after I wrote up some ideas, I was ready to begin my internship. I'll be making a mobile application (using Corona Labs) and a virtual environment for the Oculus Rift (using Unity Pro). I will also be looking at what kind of jobs and projects the Tech labs work on. My goal is to get a good impression of the Network Institute and the Tech labs. Furthermore I would like to be able to make my own mobile applications and virtual environments.

Equipment bay

Creating virtual character using iClone

To facilitate the increased demand for virtual characters that look realistic, move realistic and can use facial expressions (including lip sync), the Tech Labs bought a license of the iClone pipeline set of software tools. With this we are able to quickly create realistic humans in any size and shape. Small and thin or tall and fat, children or elderly, everything is doable. These characters can then be animated, including lip sync and facial expressions and used in other tools like Unity or Unreal.



Glyph

The Glyph is another Kickstarter funded tech project that aimed at developing a hybrid between a high-end headphones and a video-display system. You can use the Glyph like any standard high-end headphones, but once you rotate the headband in front of your eyes, it turns into a cinema set that is able to display HD video, including 3D imagery.



Rift and HTC Vive

As most of you probably know, Oculus and HTC have recently released their consumer versions of their head-mounted-displays. The Rift and the Vive. Although we still have to be a little patient (long delivery times), the Tech Labs have ordered one of each to test which would be best for research and/or educational use. At the moment it's only possible to order one at the time, but hopefully when we've made our decision it'll be possible to order a set so future projects.



Oculus Rift



HTC Vive

Haptic feedback vest

As noted in the short description of the “Virtual violence that feels real?” project, we’ve purchased a gaming vest that enables the use of haptic feedback. The Kor-FX vest uses two large vibration motors that are controlled over Bluetooth to give the user the sensation of physical impacts. The vest originally works by processing in-game sound assuming that impacts always coincide with loud noises, but we’ve “hacked” the vest so we can directly control the vibrations.



The Kor-FX gaming vest