

# Network Institute Tech Labs

## Newsletter Winter 2015

Time for another update from the Network Institute Tech Labs.

As always, please do not hesitate to make suggestions for the next Newsletter, to ask for advice or help. The Tech Labs are there to help you do your work using modern technology. We have yet to let anyone down asking for our help! Don't worry if you don't have any funds or are not even sure of what you want or need, just let us know. If you need to get in contact with the Tech Labs, please email Marco Otte ([m.otte@vu.nl](mailto:m.otte@vu.nl)) or look at the Network Institute website: [www.networkinstitute.org](http://www.networkinstitute.org).

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### Research

#### Green Labs

##### 1. Large-scale Data Gathering on Software Energy Efficiency

Nowadays, a large part of the ICT energy footprint is due to datacenters and other large-scale ICT environments. However, no research has been done to assess the impact of software systems and applications on such a scale. This project aims at setting up a shared infrastructure between the VU and the HvA to conduct experimentation in software energy efficiency. In 2015, the VU launched the Green Lab as a research initiative. The next natural step is to create a shared lab. This will be done through developing multi-server setups, enable remote-accessibility of the labs for students of both institutes, and further validate test-protocols for analysis of more complex software systems. The final outcome of the project will be a distributed lab, composed of multiple server machines. The servers will be equipped with the necessary instrumentation for fine-grained power consumption analysis and a software platform to support experimentation. Such platform will be remotely available, to enable researchers and students from both institutions to use the lab facilities from multiple locations.

*Researchers: Patricia Lago, Giuseppe Procaccianti (VU) / Robert van den Hoed (HvA) and Nina Wolfram*

##### 2. Development of an Energy Dashboard for VMs

VMware wants to offer an Energy Dashboard to their customers to monitor the energy consumption of applications running in their Virtual Machines. In this way, their customers will receive insights about their energy consumption in the Cloud. This project will investigate the State-of-the-Art in energy dashboarding and test possible implementations for a VM Energy Dashboard.

In collaboration with Joek Hondius of REM Automatisering, the software suite OpenWave will be utilised as a case study.

*Researchers: Patricia Lago, Giuseppe Procaccianti (VU) / Jan-Willem Lammers (VMware) and Rio Essed*

The Tech Labs set up a space in the MediaLab for the servers and collaborated in setting up and realizing the network requirements.



### Gamespace Awareness

Gamespace Awareness (GA) is a collection of 40 awareness elements aimed at helping game developers and designers to gather the awareness requirements of collaborative computer games. The question is: what is the effect on players' enjoyment, score and overall experience while varying the amount of GA.

In order to perform this evaluation, we provided the participants with three different versions of an action game, featuring a different number of GA elements. The game, Tanks!, uses cartoon-like tanks. The player's goal is to destroy the other tanks in the battle arena. We'll measure if players felt better or worse with varying amounts of awareness information. To evaluating the players' enjoyment, their faces were recorded during the sessions and analyzed afterwards with a facial expression analyzing software. We also used an eye-tracking device to assess which GA elements are the most useful to achieve the game goal. Moreover, the participants will fill out a survey, to inform about their enjoyment playing the different versions of the game. After, they will be asked how useful the 21 implemented GA elements were for achieving the goal of the game.

The Tech Labs offer the use of the Game Cella' Lab with high-end gaming computers, professional headphones and standard game controllers. For one computer an Eye Tracker was added to record the gaze direction of the player.

*Researchers: Miguel Teruel*



### **Virtual violence that feels real?**

Many say that one of the biggest new media technology developments in the coming decade will be Virtual Reality technology. For example, the Oculus Rift, a combination of head-mounted display and motion tracking device, has received great attention from video game producers seeking more immersive game environments to journalists interested in developing VR journalism.

What is so special about VR technology? If one thing, then it's the experience of Presence that makes VR unique. Presence simply means that objects, social beings, and landscapes feel present, as if they really existed in the here and now.

Violent video games define one of the biggest market segments. In the future VR games will inevitably feature violent content. But how will this affect the experience of users? How does it feel to do harm to a virtual being in a VR environment?

This is the basic research question of this study. The experiment will feature a realistically looking setting in a bar, in which participants will encounter and engage in violent conduct against a non-violent virtual female character. In the experiment, the environment will be either displayed with Oculus Rift VR technology or on a computer screen. The participants' behavior will be recorded and analyzed. In addition, their subjective feelings and thoughts will be assessed based on an ex-post self-report questionnaire.

*Researcher: Tilo Hartmann*



## Emotions and robots

To test our hypotheses that people's emotions would influence the way they perceived a robot, we ran an experiment in the Intertain Lab. Participants in our study would talk to a Zora robot twice, while sitting comfortably on the couch that comes with the lab. After these short interactions with Zora, participants answered questions in an online questionnaire (programmed in Qualtrics) at one of the demo bar PCs.

We placed an unobtrusive webcam so that the researchers could monitor participants' interactions with the robot from the back room. Furthermore, the webcam was used to record the interactions that participants had with robot Zora. Because participants in a previous experiment had indicated that they sometimes felt a bit uneasy because of the researcher's presence, this webcam provided us with a great opportunity to avoid any socially desirable answers to Zora's questions (which were about the participant's physical, mental, and social well-being).

Finally, there's a large screen in the staircase of the 1<sup>st</sup> floor near the lab that can be controlled from the Intertain Lab. We used this screen to advertise our experiment to prospective participants. This way of advertising worked great for us. People cannot miss the screen if they use these stairs and the lab is conveniently located around the corner, so it's very easy for people to just walk in. :)

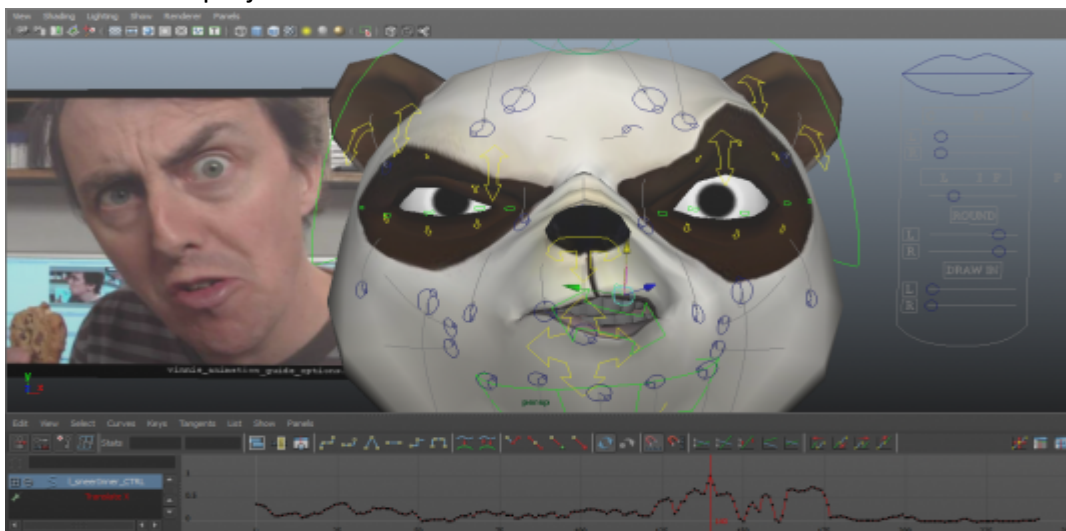
*Researcher: Marloes Spekman*



## Quick News

### Facial Motion Capture

Unfortunately for the Tech Labs, the company that made Faceshift (facial motion capture) software was recently bought by Apple resulting in closing down of the company and their software. So we've been looking for a suitable replacement. At the time of this Newsletter we're in the process of purchasing Faceware, as high-end facial motion capture and analysis system that will give us even better facial expressions to map onto any virtual character. The Virtual Violence project will be one of the first ones to use this new software.





### **FCO uses NU with Rift**

The Facilitair Campus Organisatie is in charge of the building of the New University or NU building on the VU campus. As is normal nowadays, the architects created a 3D reconstruction of the building to help plan the project and to show others what it is going to look like. In collaboration with the UvA, this 3D model has been adapted to a game-like environment making it possible to walk and even fly around inside and outside the NU building. Not only that, but it's possible to use the Oculus Rift to enjoy the building in immersive virtual reality.

At the Game Cella' Lab one of the high-end gaming computers including an Oculus Rift was made ready to lend to FCO so they can show visitors the NU building in full virtual reality glory.

In the near future, as the planning and building progresses, we will try to incorporate more and more details.

