Earthquake AR

On September 4th 2010 at 4:35 am Christchurch was hit by a magnitude 7.1 earthquake, damaging over 6,000 buildings and costing an estimated $4 Billion in repairs. However this was just the first of many earthquakes, with a deadly event happening on Feb 22nd 2011, and other severe aftershocks on December 25th, June 13th and other times. Many buildings will need to be demolished and it will be years before reconstruction is complete.

The Earthquake AR project was started in response to this emergency and explores how mobile Augmented Reality can be used to visualize the city as it was, to show reconstructed buildings and to present other earthquake related information on site. It is based on the HIT Lab NZ Android AR platform which allows users to see virtual buildings overlaid on the real world on an Android mobile phone. The Android AR platform uses the GPS and compass sensors in smart phones to load information based on where the user is and what they are looking at.

Using the Earthquake AR application people can walk around the city and see life-sized virtual models of buildings in place of where the real buildings used to be. These models show what the building looked like on site before it was demolished, as well as alternative designs for future buildings that might be erected in the same place. People can add their own feedback on the buildings shown using text input on the phones, so architects and urban planners can use the tool to get input from people about their designs.

The platform allows other geo-located information to be shown in place as well. For example, there are over a thousand stories people have submitted about their experience in the earthquake which can also appear as virtual tags overlaid on the real world. So people walking through the city can learn about the survivor’s experiences in the locations it happened. The HIT Lab NZ is collaborating with the CEISMIC project at the University of Canterbury which is creating a digital repository of earthquake related content.

The current version of the software will be made available for free download in late October to coincide with the reopening of the Cashel Mall in downtown Christchurch. This will mean that anyone visiting Christchurch with an Android phone will be able to see the city as it was, and as it will be in the coming years.

Future work will look at including more data sets such as showing power and utility information, and in connecting this system to more traditional GIS viewing software. Ongoing research could lead to a mobile Augmented Reality platform that could be quickly deployed in response to a natural disaster and provide invaluable on-site information.

External Contributors:
Two new HIT Lab PhD students

The HIT Lab NZ has recently welcomed two new PhD students who are beginning their PhD studies in 2011; Thammathip Piumsomboon and Huidong Bai.

A native of Thailand, Thammathip (Tham) graduated from University of Canterbury in 2003 where he completed a double major in Physics and Computer Science. From 2005 until 2010 he had been working at the Office of Police Forensic Science in the Royal Thai Police. During this time Tham completed his M.Sc. in Computer Science from Asian Institute of Technology. He had experience working on several ICT projects involving police work and the justice system in Thailand.

Returning to the University of Canterbury, Tham has begun a PhD in Computer Science on the topic of multimodal speech and gesture input for Augmented Reality interfaces, supervised by Dr. Andy Cockburn. He has been working with Dr. Adrian Clark on gesture interaction with AR scenes using the Microsoft Kinect hardware, and has already produced some impressive results. The first results of this research will be shown at the upcoming Siggraph Asia conference in Hong Kong in December. His broader research interests are computer graphics, haptics, robotics, physics based animation and computer vision.

Huidong is a Chinese student who completed his Master’s degree in Pattern Recognition and Intelligence System at the University of Electronic Science and Technology of China in 2010. He came to the HIT Lab NZ in 2010 as an intern and liked it so much that he decided to return for a PhD, enrolling for a PhD in Computer Science. His PhD research is studying interaction techniques for handheld Augmented Reality, mostly focusing on mobile phone based AR system and he is currently being supervised by Dr. Mukundan from the Department of Computer Science and Software Engineering.

Huidong’s research interests include Augmented Reality, Computer Vision and Human-Computer Interaction, specifically the implementation and the application of Augmented Reality on mobile devices, and 3D interaction techniques for Augmented Reality. He firmly believes that Augmented Reality techniques would become an important part of the future life. In his spare time, Huidong loves listening to New Age music, chatting online with old friends, occasionally playing table tennis and video games, also hiking sometimes.

New Post-Doctoral Fellow

The HIT Lab NZ has hired a new postdoctoral researcher, Dr. Gun Lee from Korea. Gun is a working on the “Accessible AR” project, researching interaction and visualization methods for AR and immersive 3D environments, and also developing mobile AR research. This is his second time joining the HIT Lab NZ, the first as a six month visit as a visiting intern student in late 2003. Back then, he was researching AR interaction methods and authoring tools as a part of his PhD thesis works. Gun completed his PhD in Computer Science and Engineering at POSTECH (Korea), researching immersive authoring methods for creating VR and AR environments.

Before returning to the HIT Lab NZ, he had been working as a senior researcher at ETRI (Korea) where he developed industrial applications, including Multi-projection based Hemispherical Display for reviewing car interior design, Virtual training systems for paint spraying and welding, Mixed reality based spatial planning system, and interactive visualization software for multi-view autostereosopic 3D displays.

Gun brings a wealth of experience in AR and VR systems to the HIT Lab NZ and will contribute to a number of research projects in addition to the Accessible AR work. In addition to research, he will also assist with teaching courses on Augmented Reality and other topics, engage with industry, and help students with their research.
A well-known curse is “May you live in interesting times”, referring to living through uncertainty and insecurity. This year has certainly been that. After the September 2010 earthquake people were relieved that there were no deaths, but that soon turned to grief following major quakes in December, February and June, killing over 180 people, and destroying large parts of Christchurch.

Fortunately the University of Canterbury and the HIT Lab NZ in particular were spared most of this destruction. The February 22nd earthquake closed the University for three weeks and HIT Lab NZ for six while the buildings were checked. During this trying time people were busy fixing their own homes, helping their neighbours, or trying to work as best they could. HIT Lab NZ staff and students pulled together to support each other and became a tighter knit family because of it.

In tragedy there is also opportunity. Existing research projects were adapted to fit the earthquake domain, while other new projects were started. The mobile AR work that we have been doing for nearly two years was modified to allow virtual copies of buildings to be shown where the real buildings once stood. In this way people can see the city as it was before the earthquakes. One of the exciting new projects is research on how immersive technology can be used to help cure earthquake victims of post-traumatic stress. Another new project is exploring how mobile phones can be used to allow remote experts to collaborate with first responders and emergency workers.

Another new opportunity has been created around research in Human Robot Interaction (HRI). Dr. Christoph Bartneck was hired as a new faculty member in December 2010 and since that time has begun to develop HRI as a new research theme in the HIT Lab NZ. In early October we took delivery of five NAO humanoid robots, and in the coming months a growing number of students will explore how humans and robots can collaborate together. Robots are beginning to become a fixture in the home and do this will be an increasingly important research area in the coming years.

Finally, the HIT Lab NZ has created a new masters degree in Human Interface Technology (HIT). The HIT degree will start in 2012 and is a one-year program that will give students the opportunity to learn interface design, development and evaluation. They will also work closely with industry on an applied research project for their thesis, strengthening connections to industry. This is the first degree of its type in NZ and so we are hoping that it will be attractive to international students, and well as training New Zealand next.

As 2011 draws to a close the HIT Lab NZ has survived and we have begun laying the groundwork for great teaching and research in the years to come. Although the earthquake was a once in a lifetime event, the lessons learned can be applied on a daily basis.

- Dr. Mark Billinghurst  
HIT Lab NZ Director
The HIT Lab NZ is continuing to develop and extend the popular BuildAR software for creating Augmented Reality scenes. The software has been downloaded more than 15,000 times and is particularly popular for marketing and educational applications, especially because of its easy to use interface.

On the 15th of April the HIT Lab NZ released the BuildAR Pro 2 software which included a new “Image based tracking” function. This allows almost any printed image to be used for Augmented Reality overlay, rather than the black and white printed squares that were used in the earlier BuildAR Pro software. For example, 3D AR content could be overlaid on the cover of a magazine, or the pages of a children’s book. The only requirement is that there is a digital image of the page being used for tracking and that the picture has easily distinguished regions of high contrast.

To make distributing AR scenes easy, the BuildAR Pro 2 software automatically creates a stand-alone AR scene launcher. Double clicking the launcher icon will quickly load the AR scene in full screen mode. This will make it easy for educators and others to distribute AR content.

The final development is that the BuildAR Pro software has been ported over to the MacOS operating system, enabling it to run natively on MacIntosh computers. This version was released on the 25th August 2011 and it will be free for BuildAR Pro users until the end of October. It should be especially popular in schools and other settings where Mac computers are widely used. This software only supports marker based tracking, but a Mac version of BuildAR Pro 2 is also under development.

BuildAR is available for download from http://www.buildar.co.nz/

BuildAR competition

To promote the launch of the new BuildAR Pro 2 software, the HIT Lab NZ ran a competition to see who could develop the best educational AR application BuildAR software. Many entries were received and the prize winners were announced in May.

The first prize went to Sebastian Kerner, a student from Germany for an amazing example of an AR view of a Stirling Engine. The AR scene used a very nice 3D model and animation to clearly explain how a Stirling Engine worked. The two runners up were Marcos Gomez from Spain and Jorge Martin-Gutierrez from Spain.

In addition to the videos, the winning AR scenes are available for download from the BuildAR website. http://www.buildar.co.nz/buildar-showcase-2/

The website is still open for scene submission. To submit your own AR scenes please contact buildar@buildar.org
“colAR” Software Released

colAR is a computer program that brings colour-
ing book pages to life through the magic of Aug-
mented Reality! Users can colour in the book
pages and then see them come to life as virtual
images on their computer screen when they hold
the page up to a web camera. The HIT Lab NZ
developed this software for the Christchurch
Kidsfest 2011 event, and made it available for free
download.

The application shows a normal colouring book
page as a AR pop up image through a web camera.
It captures the colours that are used to colour
in the page and applies them to the virtual pop-
up image so that each coloured page will have a
unique Augmented Reality scene.

To create the virtual pop-up book scene the
software first looks at the original black and
white page to learn the visual features which can
identify the page shown, and how it is positioned
in the environment. The software then gets live
images from the camera, and removes all of the
colour from them. The features learnt earlier are
searched for in the captured image, and if the page
is found, the colour is read out of the camera
image. These colours are then applied to a virtual
pop up scene which was created by the artist, and
the pop up animation is played on top of the page.

The original AR application idea came from re-
search by Adrian Clark and Andreas Duenser and
then was developed further based on on-going
user feedback. After having lots of good feedback
about this technology, the research team had de-
cided to make the software available so that more
people can enjoy the technology.

To download and try the “colAR” software for
yourself please go to:
http://www.hitlabnz.org/colAR

People that are interested in using a customised
version of the colAR application for their busi-
ness can contact
Katy Bang (katy.bang@canterbury.ac.nz) for more
information.
Surfing on the web, I find a cool Augmented Reality (AR) application and decide to try it out. Reading through the instructions, I download the software, go through the installation process, print out a page of tracking patterns, start up the software application, and finally a brand new virtual car appears on top of the tracking pattern, showing eye catching animations. Later on, I find another piece of AR content, and start to download the software, and again, I need to install it first. Repeating this routine couple of times, soon I find myself deciding not to install the software, but just watch a video clip of it. Video clips just start to roll as soon as I click them. They don’t ask me to go through those time consuming download and install processes, and I don’t have to worry about uninstalling them later on.

Images or video clips standard formats, allowing them to be easily viewed and exchanged between applications, and they are even accessible right inside a web browser. In contrast, AR content doesn’t have a common file format. Even worse, they are usually distributed as application software, rather than as content clips, requiring users to install software each time they want to view the AR content. While there are authoring tools available for creating AR scenes, such as Build AR from the HIT Lab NZ, each one of these tools uses its own proprietary file format, which cannot be exchanged with one another, and there is no general viewer for AR file formats.

Looking into the distribution side of AR content, FLARToolKit has been one of the most successful cases of technology for running AR content on the web. As an ActionScript version of ARToolKit, FLARToolkit uses the the Adobe Flash plug-in which is widely adopted in most web browsers. While it is useful for distributing AR content on the web, it is still hard to use it as a standard format for exchanging and reusing this AR content between different application software. Also, as we can see from recent trend of web developers considering HTML5 as an alternative to Flash, as a non-standard technology, it is hard to believe that it will last when an international standard technology takes over its place.

Fortunately, some standardization organizations are interested in making standards for AR content. While many of these efforts focus on standardizing geographical information for AR information browsers, the Web3D Consortium is interested in AR as three-dimensional (3D) graphics content. Based on its historical VRML standard, the Web3D Consortium has been developing X3D, a royalty free open standard certified by ISO/IEC JTC1. It’s the name stands for Extensible 3D graphics, and X3D is a standard for describing and exchanging scene graphs on the web in XML format. Recently collaborating with the World Wide Web Consortium (W3C), the Web3D Consortium is looking forward to adding components of X3D into the HTML5 standard, as a way for describing 3D graphics inside an HTML5 document. Compared to the imperative style of WebGL describing 3D graphics in JavaScript, X3D describes the scene graph in a declarative way, allowing developers to deal with the 3D graphics scene at a higher level.

The Web3D Consortium is looking forward to supporting AR visualization in the X3D standard and has recently started up a new working group focusing on AR technology. The group is researching common features of AR contents, and is planning to extend the X3D standard by adding missing components for supporting AR visualization. As one of the leading AR research laboratories, the HIT Lab NZ is also contributing to standards development. The experience of the HIT Lab NZ in developing AR applications, including authoring tools, are expected to be helpful in developing proper standards for AR content. Developing future technologies based on standards will help the lab deliver its products to the market more effectively. As an AR researcher, I am looking forward to having standards for AR content, which could lead to AR becoming a more mainstream media technology.

Gun Lee, Post Doctoral Fellow
I N S I D E

A completely redesigned website for the HIT Lab NZ was launched on July 5th, 2011. The goal was to give more structure to the information presented about the laboratory. The new website links people, projects and publications closely together, and so it enables visitors to get a better insight into the research work and the people of the HIT Lab NZ. This also provided the opportunity to review the website content, consolidate communication channels, and to change the backend technology.

The new website was designed by intern Elwin Lee under the direction of Dr. Christoph Bartneck. Elwin is an interaction designer from the Eindhoven University of Technology in the Netherlands and he was able to use his skill to create an inspiring and fresh appearance for the HIT Lab NZ website.

The new website is now in a public beta phase and we would be grateful for any feedback that you might have.

Rekindling Venus

The HIT Lab NZ has worked with well known media artist, Lynette Wallworth, to develop the Rekindling Venus: In Plain Sight artwork. Rekindling Venus is a set of artworks using digital platforms to connect us to the world’s coral reefs and the ecological urgency of climate change. Various installations will be created over the next year culminating with the transit of Venus in June 2012 where Venus passes between the Earth and Sun.

ReKindling Venus brings a focus to the complexity of coral ecosystems around the world as they attempt to deal with increasing environmental stresses. In the lead up to June 2012, ReKindling Venus invites people to join a network of other people around the world who are holding the coral, seeing it’s colours in their workplace and home, and allowing them to connect daily to the immediate threat confronting these incredible, fragile ecosystems.

In Plain Sight is the first of the ReKindling Venus installations and was debuted at the Adelaide Film Festival on February 24th 2011. This work was an AR project in which virtual content, triggered by a series of printed images, was delivered to mobile phones, opening a virtual porthole to coral reefs and connected to real-time data.

The mobile AR experience involved two components. Initially, people walking around outdoors can hold their phones up to see virtual tags appearing over the real world, one on each of seven movie theatres. The virtual tags guide the people to the theatres and once there, they can go inside to see seven large photographs of coral. When people hold their phones up and look at the coral pictures they see the images morph into an animated 3D virtual model showing the coral under the sea with fish swimming around it. The corals appear like beautiful jewels, as the virtual content shows how they become fluorescent at night. The virtual coral model also contains information about the real time water temperature at the reef where the coral was taken from.

In Plain Sight will be followed by other pieces, including an immersive full dome feature developed for planetariums that will be launched globally in June 2012 as part of the program for the London 2012 Cultural Olympiad. For Wallworth, the Transit of Venus provides a metaphor for global scientific co-operation that was achieved once before in the 1700s and is needed now to address the urgent scientific challenge of our times — climate change.

Lynette Wallworth is an Australian artist who creates highly engaging, immersive video installations that reflect on the connections between people and the natural world. Her works use interactive technologies in ways that allow viewers to experience them intuitively. The works are frequently developed in consultation with leading scientists working in fields of inquiry relevant to the themes of the work. Her work has been presented at the Auckland Triennial, Melbourne International Arts Festival and the Sydney festival, among others.

More information can be found at the website: http://www.rekindlingvenus.com
In February, Mohammad Obaid from the HIT Lab NZ was awarded a MARCUS exchange grant to visit and work at the Institute for Computer Graphics and Vision (ICG) at the Graz Technical University (TU Graz), Austria.

Dr. Mohammad Obaid is a research associate at the HIT Lab NZ and recent PhD graduate. He conducts research on understanding the user's perceptual experience when interacting with expressive agents in augmented reality and virtual environments. At TU Graz, his goal was to advance his knowledge of Augmented Reality-based virtual agents and their integration into mobile AR technologies. He used his time to learn the Android-AR framework and the integration of expressive conversational virtual agents into smart phones. He collaborated with several researchers at TU Graz and discussed extensively the use of AR-based agents in real world scenarios. Several brainstorming sessions led to great ideas on how to study the user’s behavior towards AR-based agents.

Dr. Obaid also attended the annual Winter of Augmented Reality Meeting (WARM 2011) which was held at TU Graz. There he discussed several ideas with some of the attendees regarding the AR-based agents and mobile AR technologies. He used his time to write two conference papers relating to the field of virtual agents in augmented and virtual reality spaces. The papers were successfully accepted into the IVA 2011 and Web3D 2011 conferences, both leading conferences in the field. Outside of work, Mohammad enjoyed his time traveling and exploring the landscape and the snowy high mountains of Austria.

- Dr. Mohammad Obaid
A second MARCUS exchange was undertaken by Michael Groufsky, an Electrical Engineering Masters student from the HIT Lab NZ. Michael provided this report about his exchange:

One of the great things about the HIT Lab NZ is the links it has with overseas research institutions. Recently, I was lucky enough to spend some time at one of these places; specifically, the Fraunhofer FIT institute in St. Augustin, Germany. I had just finished my Master’s degree here at the HIT Lab NZ, developing an embedded platform for augmented reality. For two months I worked to adapt this technology to meet the needs of the researchers at Fraunhofer FIT.

The device that I had developed for my Master’s degree consists of a single-board computer with an attached camera, capable of running a modified version of the ARToolKit AR software. You can think of this hardware as a high-end mobile phone with all the non-essential parts (screen, battery, keypad etc.) removed. The purpose of the German trip was to see if this device could be useful to Fraunhofer FIT in their investigation of applications for underwater AR. Their initial prototype made use of a backpack computer, but the aim is to have all the electronics built into a diving mask, something that is only possible with an embedded system.

This was a feasibility study only, so further work is required to actually realise this goal. Still, I was glad to have a real-world application for the technology I had spent the last couple of years working on. Personally, I really enjoyed the experience of living in Germany. The people I met were great and the area where I lived was really nice.

Thanks to Lisa Blum and Leif Oppermann at Fraunhofer FIT for hosting me and to Mark Billinghurst here at the lab for setting up this trip.

Fraunhofer FIT website: www.fit.fraunhofer.de

- Michael Groufsky
The CHINZ conference on Computer Human Interaction was recently held on the 4th and 5th of July in Hamilton. This was an international conference focusing on Computer Human Interaction. Rory Clifford, a student from the HIT Lab NZ, attended the conference to present a paper about an AR building design tool. He provided this report about his experience at the conference:

There were many interesting presentations at the conference. One in particular was about designing interactive physical games. The speaker discussed methods to utilize current technology to create physical games that have a large element of technology and computation to control the game, while still maintaining other aspects of sports that are often not present in current sport technology, such as psychologi cal aspects like reading your opponents body language when playing sport or to feign your opponent to gain an advantage in a game. Other interesting projects were a GPS that had a breadcrumb mode, helping recover path traces left by the user. and a new document type interface, that aimed at re-defining the book with an advanced digital book format, as well as many other interesting presentations.

I presented our work on an Augmented Reality prototype system, where the software system would model 3D buildings from 2D blueprint diagrams. The design goal was to make the system useable for rapid prototyping by using the openCV, openGL and Opira libraries. OpenCV was used to manipulate the image to eliminate noise and text on blueprints. It was also used to extract vertex co-ordinates about where walls were located. OpenGL provided the 3D modelling and Opira provided Markerless Tracking.

The presentations were all very interesting, especially those given by the key note speakers Trent Man kenlow and Holger Regenbrecht. Trent is the founder of Optimal Usability and explained what it takes to be a usability engineer and about the type of people he looks for when hiring employees. A broad knowledge of technology was a key component, as well as great attention to detail and communication skills were all essential skills for usability engineering. The other key note speaker, Holger, talked about the various stages a software system could be in and how these systems can be presented to target users at the various stages, as well as other key points of interest when developing systems.

If you ever get the opportunity to present at a conference I would highly recommend it. Not only was it gratifying to publish findings about an interesting topic, but it was really fun meeting other people who had similar interests. I quickly found that it was easy to talk and communicate ideas with the other people attending, as everyone had something fun and interesting to talk about!

- Rory Clifford, Honors student
The Unofficial LEGO Minifigure Catalog

Dr. Christoph Bartneck has been working on an exciting design project: The Unofficial LEGO Minifigure Catalog. This book presents high quality photographs of all LEGO® Minifigures released between 1970s and 2010. The 3600 plus Minifigures® are organized by an innovative nomenclature that makes it easy to identify them. Several indexes make it easy to find Minifigures®, the sets in which they appeared and what heads belong to which figure. This catalog is the essential guide for all Minifigure® collectors and enthusiasts.

Website: http://www.minifigure.org

New Visiting Erskine Fellow

My name is Rob Lindeman, and I’m very excited to be a visitor at the HIT Lab NZ for the next year! I am an Associate Professor in Computer Science and Interactive Media & Game Development at the Worcester Polytechnic Institute (www.wpi.edu) in Massachusetts, USA. My research mainly covers Virtual Reality (VR) topics, including 3-D User Interaction, Multi-Sensory Interfaces, Usability, and Game Design & Development. I have come to the University of Canterbury through the kind support of the HIT Lab NZ, as well as through the generous support of the Erskine Fellowship.

My research lab in the States focuses mainly on the use of multi-sensorial interfaces to improve user experience in VR and games. The unique point about our work is that rather than focusing on one of the human sensory systems, say the sense of touch, we are interested in how the senses can be stimulated in concert, on the premise that this approach will lead to interfaces that take fuller advantage of our physiology and psychology for how we interact in the real world. We are also interested in how we can design interaction techniques that allow immersed users to be effective, while at the same time reducing the amount of fatigue incurred by some existing interfaces.

While I have done some work in Augmented Reality (AR), mainly for AR audio, I am looking forward to learning a lot about AR in general, and to contribute to the interesting and challenging problems being worked on at the HIT Lab NZ. I especially welcome the chance to assist on projects that merge AR and gaming, as I think there are lots of possibilities for creating compelling experiences involving AR, geolocation, and game techniques.

I am an avid soccer player, skier, and geocacher (www.geocaching.com), which is a world-wide treasure hunting game/hobby/obsession using GPS-enabled devices, and look forward to enjoying all three of these while in NZ. I also enjoy travel, biking, and hiking, all of which NZ is well known for.

Dr. Rob Lindeman
LIFE OUTSIDE THE LAB

Pictures from HIT Lab mid winter dinner party. The theme was 70s show! Hazel won the costume competition.

Yuan Wang graduated this year and is working in Singapore.

Brian Thorn honors graduation day.

Ex-HIT Lab members (except Andreas) gathered in Austria. Try to guess who’s who.

Answer: from left: Jörg, Harunur, Raphael, Andreas, Tobias Langlotz.
New Interns to the HIT Lab NZ

Seungwon Kim studied computer science in Chonnam University for two and half years and transferred to University of Tasmania. He finished his bachelor in University of Tasmania and completed his master degree in HIT Lab AU. While he studied in HIT Lab AU, he developed a 3D navigation system using Google Earth and VisionSpace. In June 2011, he started an internship at the HITLab NZ. During his stay at the HITLab NZ, he will develop mobile programs by using Android and research on 3D interaction with VisionSpace.

In his spare time Seungwon Kim enjoys travelling and playing sports such as tennis and biking.

Karolina Zawieska is a PhD student at SMART-lab/University College Dublin in Ireland. She has been working in the area of Human-Robot Interaction and Roboethics at the Industrial Research Institute for Automation and Measurements in Poland.

She has a background in Social Sciences and Sociology. Her research interests include a variety of topics, among which emotional bonding between humans and robots. This is also what she is going to investigate during her two month internship at the HIT lab NZ.

She is addicted to travel and morning coffee. She loves doing karate.

Shun (in the middle) worked at the HIT Lab NZ as a 3D designer for two years. He left for Japan in early August and he already misses NZ.

We all wish him good luck with his new voyage.
Human-Robot Interaction: A new research focus for the HIT Lab NZ

The HIT Lab NZ is on the leading edge of understanding and developing new interfaces between humans and technology. A strong new field of research in this area is the interaction between humans and robots and the HIT Lab NZ is now actively investing in human-robot interaction (HRI).

The role of robots in our society is becoming increasingly important. By 2005, service robots, such as lawn mowers and vacuum cleaners outnumbered industrial robots. One type of service robots, social robots, are expected to have an important impact on our society. Social robots have long outgrown their first uses in entertainment, such as Sony’s Aibo, and now comfort the elderly or tutor children.

Service robots have to operate in environments designed for humans. They need to navigate in our homes, climb stairs and reach out to items on our tables. Furthermore, they will be used by people who might not be able to program them. So the robots are often designed to mimic humans and are equipped with speech technology. This attempt at natural interaction comes at a price. Users tend to anthropomorphize the robots or perceive them to be “somewhat alive”. This perception of anthropomorphism and animacy is a real challenge, since it sets unrealistic expectation levels in the user and has a major impact on how users interact with the robot. For example, we previously showed that the robot’s behavior has a considerable influence on how users hesitate to switch it off. Balancing the robot’s behavior and communication skill with its abilities is therefore of utmost importance for successful human-robot interaction. The need for a good understanding of anthropomorphism and animacy becomes even more important when dealing with the latest, highly realistic humanoid robots, such as the Geminoid-HI-1, the android copy of Ishiguro.

One of the major motivations for our work is the simple fact that you cannot not communicate. Even if we do not understand or design the anthropomorphism and animacy of a robot, users will perceive it. So instead of leaving this important factor for the acceptance of robots into our society to pure chance, we actively investigate and design it.

- Dr. Christoph Bartneck
Another Award Winner

HIT Lab NZ PhD student, Sebastian Koenig, was recently awarded a prestigious Laval Virtual award for a paper published as part of his PhD research. He writes about his experience here:

As part of a six-month stay in Germany, I received the opportunity to present clinical data for a Virtual Memory Task at the Laval Virtual 2011 conference in France. The Virtual Reality International Conference is paired with an amazing expo of the latest virtual reality technology and a spectacular ceremony of the Laval Awards. All of this is set in the beautiful village of Laval, France, which by itself is already worth the visit in early spring.

After attending the conference at the beautiful Hotel Perier Du Bignon, the fun actually just started. Besides submitting a conference paper, I also submitted an entry to the Laval Awards. Looking through the entries of past years, the quality of work was competitive, but not unreachable. I decided to create a short video and a description of my thesis work and submit it for the category “Medicine and Health”. I didn’t have high expectations, because I still expected to be competing against several great projects. I wasn’t even sure whether I should attend the actual ceremony, but was told that the event itself is already worth the time.

The Laval Theatre presented itself in a glamorous light, with many cameras, researchers and politicians in their festive attire. Even though the event’s program already hinted at a possible prize (it mentioned the HITLabNZ as one of the presented projects), I was still overwhelmed when my work on “Individual Virtual Reality Rehabilitation” was announced for the “Medicine and Health” category.

Being on stage in front of maybe one or two thousand people and many cameras is not straightforward, especially if they expect some sort of verbal response. Add to the mix that my French got very rusty over the years, and I was definitely nervous. The only person who was even more nervous, was my translator. I kept talking and talking and she started to look more serious at me. Finally, I realized I should take a break between sentences, so that she can keep up and translate what I was saying.

So for anyone in a similar situation: two to three sentences at a time, or the translator will get mad at you. Speaking of similar situations; I can only encourage any Masters or PhD students to actually make the effort and apply for the VRIC and the Laval Awards. It has been a great experience for me and I would definitely like to come back to Laval in the future.

- Sebastian Koenig, PhD student

Sebastian Koenig at the award ceremony
On the 22nd of February, 2011, Christchurch experienced a second, far more violent earthquake lunch time. Myself and Coco were in almost exactly the same place as the first earthquake and we stood in the same doorway. We were thrown around quite a bit, but it was very short. In less than 30 seconds, 150+ people were killed by falling buildings. But we didn’t know that yet.

During the earthquake, a lamp shade that was sitting on a pedestal was wobbling from side to side. In my memory, it is almost like slow motion, it was swaying like a pendulum from one side and then to the other side getting closer and closer to the point of no return. Finally, right before the earthquake subsided, it did a 180° rotation upside down and fell directly on top of a pot plant.

The Aftermath

Right away, I went to check around the house to make sure there was no immediate danger. The only thing that broke was a teapot that fell from a shelf, but remarkably, most things in the house were fine. Thanks to my suspended shelves, all my A/V equipment was fine. The backup batteries in the garage were beeping — power was cut — so I quickly shut down all our computer equipment. Then, I grabbed my camera.

At this point I decided to head into the City to survey the damage. Being on a bike was great because there were so many damaged roads and traffic jams, so it allowed me to get around easily. At this point, I called my friends Henri and Yoko. They were over at St Margaret’s. I went over to meet them, and on the way I also met Tomomi and Emiko. Their flat was badly damaged.

All in all, a very difficult and tragic event for people living in Christchurch!
- Samuel Williams, Masters student
HIT Lab NZ researchers have presented their work at a number of prestigious international conferences such as SIGCHI-NZ, IVA2011, Cybertherapy 2011, ACM etc.

The list below shows the recent publications. Full text of all these publications can be downloaded from: http://www.hitlabnz.org/index.php/publications

**Publications 2011 & 2010**

**Year: 2011**


Year: 2010


