Further fame for popular MagicBook project

The HIT Lab NZ’s three-dimensional virtual picture book has been named as a New Zealand finalist in the 2005 World Summit Awards.

The eyeMagic project, a collaborative project between the HIT Lab and noted children’s author and illustrator Gavin Bishop, will represent New Zealand in the entertainment category.

It is further recognition for a project that has attracted phenomenal international interest from the media, industry and educationalists, including a recent request from leading educational publishers Pearson Education (UK) to feature the technology in a new education textbook.

The eyeMagic project explores the application of AR technology to children’s literature.

Using the technology, Gavin Bishop’s story Giant Jimmy Jones was transformed from a normal printed book into one where three-dimensional animated virtual images appear to pop up from the real pages.

Gavin Bishop says he is delighted the book has been selected as a finalist. “It will bring this technology to the notice of the world although there has been a lot of interest in it from Britain already.”

“I really enjoyed working as part of a team, something that I don’t usually have the opportunity to do when writing a book. And to work with

Continued page 2 ...

One of “the” talked about places in NZ

New Zealand’s Minister of Research Science and Technology Steve Maharey dropped into the HIT Lab NZ this month to catch up with how the Lab is putting to use its funding from the Government.

Mr Maharey is responsible for the Ministry of Research Science and Technology, one of the Lab’s major sources of funding. The Lab was on his list of must-see places during a visit to Christchurch. “It is important for me to see for myself how the agency’s funds are being used,” he said.

“The HIT Lab has such a big reputation as one of the talked about places in New Zealand. Extraordinary, amazing things are being done here.”
**Best paper award for Lab academic**

Dr Richard Green, a lecturer in UC’s Computer Science Department and an academic staff member in the HIT Lab, has been selected to receive the 2005 IEEE Transactions Best Paper Award from the IEEE Circuits and Systems Society.

His paper, written with Professor Ling Guan from Ryerson University, is titled Quantifying and Recognizing Human Movement Patterns from Monocular Video Images - Part I: A New Framework for Modeling Human Motion. Dr Green says research into tracking and recognizing human movement has so far been mostly limited to gait or frontal posing.

Part I of his paper presents a Continuous Human Movement Recognition (CHMR) framework which forms a basis for the general biometric analysis of continuous human motion as demonstrated through tracking and recognition of hundreds of skills from gait to twisting saltos.

Using multiple Hidden Markov Models, the CHMR system attempted to infer the human movement skill that could have produced the observed sequence of dynemes.

Dr Green also led the HIT Lab NZ’s work in developing a low-cost motion tracking system for the Lord of the Rings exhibit at the Boston Museum of Science and a large interactive touch screen for the New Zealand Pavilion at the World Expo in Aichi, Japan, both projects with HIT Lab NZ partner, Story Inc!

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The paper can be found at [http://ieeexplore.ieee.org](http://ieeexplore.ieee.org).

**Fame continues for MagicBook from P1**

One Glass Eye and (HIT Lab student) Claudia Nelles, the animator, was terrific too.

Gavin is currently working with the HIT Lab on a second magic book based on his award winning story, *The House That Jack Built*. The project is still in the planning stages but he says the book will be animated in a “much more interactive way”.

The World Summit Awards will be a global showcase of 40 outstanding information, communication and technology (ICT) projects from around the world. New Zealand’s eight finalists will be evaluated with entrants from 196 other countries in August in Bahrain. The winners will be announced at the WSA Gala in Tunis on 16 November 2005.

New Zealand’s Minister of Communications and Minister for Information Technology David Cunliffe said “The winners of these awards represent the talent which will take this country into the forefront of the ICT global market.”

“**The winners of these awards represent the talent which will take this country into the forefront of the ICT global market.**”

**World first for Consortium member**

Mixed Mob, a division of consortium member ZODAL NZ Ltd, has launched a new mobile phone channel technology.

The technology is integrated into the world’s first mobile game channel developed on the Macromedia Flash Lite Platform. Mixed Mob is recognized as New Zealand’s leading Flash Lite developer for mobile applications.

Haka Mania Game Channel ([www.hakamania.co.nz](http://www.hakamania.co.nz)) showcases the next wave of mobile content available for mobile phone users, building on top of where SMS technology is limited.

Unlike traditional WAP pages, the interface of a mobile phone channel can be highly graphical and interactive.

This is achieved because the channel accesses only the essential data via a GPRS transfer, providing the mobile user with specific personalized requests in real time right to their phone. (contd)
Access Grid a first for New Zealand

HIT Lab NZ has teamed up with a social sciences network to launch a nation-wide access grid, the first of its type in New Zealand.

The Access Grid is a collection of resources and technologies that enable large format audio and video based collaborations, including multimedia large-format displays, presentation and interactive environments, and interfaces to Grid middleware and to Visualization environments.

Working with the Building Research Capability in the Social Sciences Network (BRCSS Network) based at the Wellington campus of Massey University, the HIT Lab NZ is deploying nine access grid nodes across New Zealand universities to provide video, audio and data collaboration between each site.

The grid will be a vital tool that will enable Network teams from the various universities to increase their meeting productivity and communications between each other as well as minimising costs.

Technical co-ordinator HIT Lab NZ’s Nathan Gardiner says Access Grid uses existing internet bandwidth to establish a private multicast network to transfer data and allow connectivity.

“There are bandwidth limitations but with the introduction of the NGI Advanced Network early next year the Access Grid will be able to run at much higher quality levels.”

Nathan says that as of 2005 there are more than 200 nodes around the world that allow for various forms of creative and academic collaborations.

“With Access Grids being substantially cheaper than standard video conferencing and travelling costs it is hoped that more sites will be setup across New Zealand for educational, commercial, government, and medical institutions.

“Plans are under way for installations at each of the nine sites and it is anticipated that four of the sites will be online by early August and the remaining sites due to go online by the end of September,” Nathan said.

About BRCSS:
- The aim is to improve social science research capability.
- The main focus of BRCSS will be contributing to the development of new and emerging researchers, and building new teams
- BRCSS will encourage networking, shared workspaces and specialist video conferencing.

For more information visit http://www.accessgrid.org or contact nathan.gardiner@hitlabnz.org

New mobile channel technology from P2

The new mobile channel technology supports multilingual deployment and is being showcased in English and Korean.

Christopher Blair, Managing Director of Mixed Mob, says a mobile channel can be thought of like a TV channel: by selecting a channel topic and downloading it to a phone, the specific information is then channeled to that phone.

“Mobile channels can help solve problems that have previously been difficult to tackle. Through mobile channels businesses can increase their service effectiveness, offer new services, or increase their business efficiency, creating new wealth.”

Key benefits include:
- customer relationship lock
- enhanced usability over SMS or traditional WAP mobile surfing
- controlled data flow in both directions

The parent company, HIT Lab NZ, Consortium member ZoDAL, is now looking for a major partner company to carry the technology to the leading edge in the marketplace.

For more information see www.mixedmob.co.nz or www.zodal.net
User experience ... the design difference

On July 17th at 2:44pm Amy Greer purchased the 500 millionth song from the Apple iTunes music store. A remarkable achievement for Apple considering that iTunes was opened a little over two years before.

Of course most of this is due to another Apple achievement, the iPod. Since its introduction in 2001 Apple has sold over 20 million iPods, including more than 6 million in the last three months.

Many may think that Apple invented the mp3 music player, which of course they didn’t. They didn’t even invent the first hard drive based music player, which was Creative Labs in Singapore.

So how is it that despite not being first, they have successfully captured over ninety percent of the world market?

The difference is interaction design. As the webzine The Register says “While Creative’s Singaporean product designers have focused on functionality, Apple’s worked on look and feel.” In other words, while Creative’s designers focus on functionality, Apple’s designers focus on user experience. Interaction Design is significantly different from traditional design because it is more concerned with the user Experience with technology, Rather than the Technology itself. As the iPod shows, good interaction design can bring significant profits.

As New Zealand moves toward a more design led economy, interaction design will be increasingly important here as well.

Companies such as Formway, Navman and Fisher and Paykel have shown that they can design wonderful objects.

Now is the time for local companies to enable users to have wonderful experiences with objects.

At the HIT Lab NZ we are helping with this. We teach interaction design principles to our students and incorporate effective interaction design into our partner companies’ products. It is fantastic to see how even a small amount of design can add magic to the user experience. Just like Apple, by putting people first we can reap rich rewards.

Mark Billinghurst

“While Creative’s Singaporean product designers have focused on functionality, Apple’s worked on look and feel.”

The Register

HIT Lab at SIGGRAPH 2005

The theme for HIT Lab NZ’s display at SIGGRAPH 2005, the world’s leading conference on computer graphics, is AR platforms of the future.

The HIT Lab “faces” at SIGGRAPH are four students: Phil Lamb, Trond Nilsen, Graham Aldridge (all New Zealanders) and Joerg Hauber (from Germany).

SIGGRAPH is on from 31 July to 4 August at Los Angeles.

See www.siggraph.org/2005
**Project: Collaborative AR on mobile phones**

The HIT Lab NZ has developed the first collaborative AR application for the mobile phone. Tennis was chosen as the example application for the project.

While at the Lab Swedish doctoral student Anders Herysson’s PhD research focused on mobile computer graphics and interaction. Anders says he is fascinated about the possibility of mobile phones to bridge the physical world and the digital domain. He sees the camera-enabled mobile phone as an ideal platform for Augmented Reality and while at the Lab developed applications and conducted user studies.

His paper *Face-to-face Collaborative AR on Mobile phones* — with HIT Lab NZ’s Dr Mark Billinghurst and Dr Mark Ollila of Linkoping University — identifies mobile phones as an ideal platform for augmented reality and describes how they can also be used to support face-to-face collaborative AR gaming.

The research created a highly optimized custom port of the ARToolKit library to the Symbian mobile phone operating system and then developed a sample collaborative AR game based on that. Tennis was chosen because it could be played in either a competitive or cooperative fashion, awareness of the other player was helpful, it required only simple graphics, and it was a game with which most people were familiar.

Anders says previous work has shown that AR technology can be used to naturally enhance face-to-face collaboration.

“The results from our user studies show that these same benefits can be found from using mobile phones. Even with a small screen and limited input capability, users felt that they were more aware of what their partner was doing in the face-to-face AR condition than in the other more traditional gaming conditions.

“This is very different from traditional AR interfaces where the display and input devices are separated, but is ideal for small form factor phones. “

The research notes that mobile phones are becoming more and more advanced in processing power. “With the addition of cameras with more detailed resolution, AR is becoming a real possibility.” Further features such as positioning (cell based and GPS) in conjunction with accelerometers in future handsets will provide a significant increase into the applications.

“In the future we intend to develop a multimedia engine based on the built-in Symbian features and providing the developer with a simple interface to graphics, sound and communication besides tracking. We will also conduct more rigorous user studies to better understand the use of mobile phones for AR reality and provide design guidelines back into the AR community.”

A paper based on this work will be presented at ISMAR 2005 in October in Vienna. This paper is also available on the HIT Lab NZ website at [www.hitlabnz.org](http://www.hitlabnz.org).

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**US Virtual Worlds Consortium**

The 25th US Virtual Worlds Consortium 9 and 10 August will celebrate the HIT Lab US’ 16th birthday.

The event, at the University of Washington, Seattle, will include project demonstrations, a poster session, and intensive workshop sessions in advanced interface technologies, including current work in scanned fiber technology, pattern recognition, medical simulation, and haptic interfaces.

A highlight will be keynote speaker, film director, producer, cinematographer and inventor Douglas Trumbull, whose visual effects credits include Stanley Kubrick’s 2001: A Space Odyssey.

Professor Tom Furness, HIT Lab US Director, says it is an exciting time for the HIT labs. “The HITLab NZ just celebrated its second birthday and is thriving with 49 people in the Lab and 26 companies in the NZ chapter of the Virtual Worlds Consortium. This gives us an international presence and ability to work on even more exciting projects that unlock and link minds.”

For further information on the consortium contact aelias@hitl.washington.edu or visit the website at [www.hitl.washington.edu](http://www.hitl.washington.edu).
Student Project: Wheelchair Haptics

A project by masters student Thomas Zurbruegg has been exploring how to enhance the control interface of electric wheelchairs using force feedback.

Benefits for the wheelchair user in the future will be more effective control of the wheelchair, especially for those with a loss of limb strength or a tremor. Potential applications for the research include:

- Inertia compensation— Jerky events such as driving over a step cause users—especially the ones with weak arms—to be pushed against the joystick due to inertia.

- Spring replacement— The repositioning force of the joystick can be adjusted individually depending on the actual deflection.

Explaining the research Thomas, who has returned to Switzerland after six months at the Lab, says the wheelchair is equipped with different types of sensors. Other sensors such as accelerometers provide inertia compensation. The sensor signals are processed using various algorithms before being fed back to the joystick. The mechanical actuators for a prototype used DC step motors, while the final implementation was done using bearing free electromagnetic actuators.

In the first step, a generic prototype interface was designed. The interface connected the sensor signals to an on-board laptop which carried out the algorithmic calculations. In turn, the output information of the laptop representing the force feedback was interfaced with the wheelchair controller. In the second step, the specific algorithms of the force calculation were determined. Finally, a working prototype was used to test, verify and evaluate the findings.

Thomas said that once the system had been evaluated using the prototype, a definitive implementation would be done using hardwired controllers replacing the laptop. Adequate actuators meeting the medical requirements and regulations would also need to be evaluated.

Oppunities in Asia

By Mark Billinghurst

Korea is a land of opposites. Seoul is one of the busiest cities in the world and yet hidden among all the bustling traffic are quiet Buddhist temples and tree lined parks. Korean culture is one of the oldest in Asia, but the Korean people rapidly adopt new technology and lead the world in many areas of innovation.

For a week in June I was privileged to visit with a delegation of seven New Zealand computer scientists exploring potential collaboration with South Korean industry and universities. Every day we would leave our hotel and after braving the packed traffic would arrive at world-class government and academic research laboratories. At each place we were greeted with politeness and a genuine willingness to collaborate, even though we were from half a world away.

There were many impressions that stuck with me. First, even with limited resources, New Zealanders are continuing to produce outstanding research. Some of the work that my colleagues presented was truly amazing and clearly impressed our Korean hosts. Second, the Korean government and industries have a long term vision of research and are prepared to invest strategically to develop future technologies. Companies such as Samsung and LG are investing heavily in basic research that is years away from appearing in products. For example, while visiting SAIT (the Samsung Advanced Institute of Technology) we saw work on advanced materials, gesture based input for consumer electronics and next generation plasma displays. Finally, South Korean researchers have skills that would naturally complement many existing NZ ICT projects.

In addition to meeting new contacts, the visit was a chance to strengthen existing relationships. At the government research organization ETRI, I was able to spend half a day with Dr. Gun Lee, one of the first interns to spend time at the HIT Lab NZ. Graduating with his PhD in February of 2005, Gun is now researching projection based immersive reality systems. He still fondly remembers his time in New Zealand and is eager to get back to visit one day soon. I was also able to meet again with Dr. Gerry Kim from POSTECH, one of the best science and technology universities in Asia. Dr. Kim is working with us to establish a joint Korean-NZ student workshop in early 2006 that HIT Lab NZ students will be able to attend alongside Korean students.

In total we visited 17 Korean organisations and a number of opportunities for collaborative research, research and commercial funding have emerged, both for the HIT Lab NZ and the other departments represented.

As a result of the trip, two Korean companies have already joined the HIT Lab NZ industry consortium and we are looking to beginning collaborative research projects with them and others in the coming months.
Top Grades for HIT Lab NZ Interns

Two of HIT Lab’s recent international interns have gained top marks for their masters theses.

Felix Loew and Michael Siglneckow, who both came to the Lab for six months from Technische Universität München (Germany), received 1.0 grade for their theses, the top grade on a scale of one to five.

Michael’s thesis focused on hybrid tracking approaches combining AR Toolkit, inertial sensors and other vision based tracking ideas, while Felix’s work looked at improving augmented reality table top applications with hybrid tracking.

In his thesis Michael described a new approach to maintain gaze awareness between users and on a shared workspace, meaning that every user would be aware of the gaze direction and the point the other participants were looking at.

To evaluate the usability and acceptance of the application Michael conducted a user study with 30 subjects. Results showed increased user satisfaction with the collaboration session and improved awareness.

The basic idea behind Felix’s work was to adopt the search area for features to the change in orientation of user interface hardware. His work was a first step to solve this problem for a special class of Augmented Reality applications, Table Top Augmented Reality. The research provided a hybrid tracking approach to bring tracking and the user’s movement context together. Orientation information given by an additional tracker was used and applied for a dynamic configuration during runtime of the vision-based tracking routine, a texture tracking algorithm. To accomplish this Felix proposed a special software architecture.

Felix has also returned to Germany and is writing software applications. He is keen to find a job with a company that is researching augmented reality or human computer interaction as well as developing business software.

New Consortium Members

Tamaki Maori Village

A world of ancient Maori and proud warriors await visitors to the Tamaki Maori Village. The recreated pre-European Maori Village, the brainchild of brothers Mike and Doug Tamaki, includes a nightly cultural experience, performance and hangi plus a market place with exhibitions and sales. The Tamaki brothers’ driving vision is to preserve the Maori culture and add authenticitiy to the tourism experience as well as having established a successful Maori tourism business.

TL Jones

TL Jones is a world leading manufacturer and supplier of safety and accessory equipment to elevator companies around the world. Central to the company’s product range is Microscan, the original and best-in-class infrared door protection system providing the ultimate in elevator passenger protection. Highly regarded, TL Jones delivers a range of advanced elevator safety and information solutions developed within the company’s specialised BlueZone technologies program.

HumanWare

Earlier this year HIT Lab NZ consortium member Pulse Data International merged with VisuAide, a Canada-based company manufacturing products for the blind and visually impaired. The products are complementary to those produced by Pulse Data. The merger has created one of the largest low-vision companies in the world.

As a result of this merger, Pulse Data changed its name to HumanWare. The full legal definition is HumanWare Limited. For more information see www.humanware.com
Upcoming Events

SIGGRAPH2005
32nd International conference on computer graphics and interactive techniques.
For further information visit www.siggraph.org/2005/
Date: Conference July 31-August 4; exhibition August 2-4
Venue: Los Angeles Convention Centre

US Virtual Worlds Consortium
The 25th Consortium will celebrate the HIT Lab US’ 16th birthday. The event will include project demonstrations, a poster session, and intensive workshop sessions in advanced interface technologies.
For further information on the consortium contact aelias@hitl.washington.edu or visit the website at www.hitl.washington.edu
Date: 9-10 August 2005
Venue: University of Washington, Seattle, US.

HIT Lab NZ Open House
Open to all the public to come view the latest research projects which the HIT Lab NZ are working on.
Venue: HIT Lab NZ, Old Maths Building, University of Canterbury
Date: Thursday September 8 2005
Time: 4pm - 7pm

Electronics South Connectivity 05
Unlocking the world’s best kept technology secret. ES Connectivity 05 is a showcase of New Zealand’s electronic capability with an emphasis on developing and furthering relationships in the industry, and on doing business. The event includes the KiwiFlash 2005 Technology Conference and the New Zealand Hi Tech Awards.
For more information visit www.connectivity.org.nz
Venue: Christchurch Town Hall
Date: Friday September 30 and Saturday 1 October
Time: 8am-5pm and 9am-2pm

Converge05
A celebration of the creative explosion when Art, Technology and Business converge.
For more information please visit Converge05
Venue: Christchurch Convention Centre
Date: Monday, October 10-12, 2005