

Johnny Chung Lee

HCI – Carnegie Mellon University
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Education

Ph.D., Human Computer Interaction, expected early 2008
Carnegie Mellon University
Advisor: Scott E. Hudson
Thesis Title: *Projector-Based Location Discovery and Tracking*

B.S., Electrical and Computer Engineering, 2001
University of Virginia
Rodman Scholar, Dean's List

Research Interests

Novel techniques that greatly enhance the practicality and reachability of interactive technology, such as projector calibration, multi-projector applications, augmented reality, physical and tactile input, multi-point interaction, head-tracking, and biometric input.

To view projects, visit <http://jobapp.johnnylee.net>

Research Internships and Experience

Mitsubishi Electric Research Laboratory. Cambridge, MA. Winter 2002- 2006

- Assisted and lead the development of multiple new technologies producing five patent applications on projector calibration, data projection, video projector safety mechanisms, optical tracking systems, and tactile feedback styli. This work has generated one major commercial licensing contract with many more currently in negotiation.

Microsoft Research. Redmond, WA. Summer 2005

- Worked with Desney Tan to establish a new branch of research at MSR in Brain-Computer Interfaces. We identified BCI equipment accessible for HCI researchers, designed and executed initial feasibility research experiments with successful results. This work established a foundation for this line of research and has resulted in multiple new projects that are currently in progress.

Integrated Media Systems Center, University of Southern California, Summer 2001

- Developed a generalized panning algorithm for multi-channel acoustic rendering for use in high-fidelity audio simulations.

Research Assistant

Human Perception and Performance Laboratory, University of Virginia, 1999-2001

- Developed experiments in visual perception on large, head mounted, and multi-display immersive systems.

Study Group Participant

Total Recall, Institute for Science and Technology (ISAT), 2000.

- Developed prototype systems that explore the use of computer technology to augment human cognition focusing primarily of human learning and memory.

Papers

Lee, J., Hudson, S., and Dietz, P.. "Hybrid Infrared and Visible Light Projection for Location Tracking", *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, October 2007.

Lee, J., and Tan, D., "Using a Low-Cost Electroencephalograph for Task Classification in HCI Research", *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, October 2006.

Lee, J., Hudson, S., Summet, J., and Dietz, P. "Moveable Interactive Projected Displays Using Projector Based Tracking", *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, October 2005.

Lee, J., Dietz, P., Aminzade, D., Raskar, R., and Hudson, S. "Automatic Projector Calibration using Embedded Light Sensors", *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, October 2004.

Lee, J., Dietz, P., Leigh, D., Yerazunis, W., and Hudson, S., "Haptic Pen: A Tactile Feedback Stylus for Touch Screens", *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, October 2004.

Raskar, R.; Beardsley, P.; van Baar, J.; Wang, Y.; Dietz, P.H.; Lee, J.; Leigh, D.; Willwacher, T., "RFIG Lamps: Interacting with a Self-Describing World via Photosensing Wireless Tags and Projectors", *Proceedings of ACM SIGGRAPH*, August 2004.

Lee, J., Avrahami, D., Hudson, S., Forlizzi, J., Dietz, P., Leigh, D., "The Calder Toolkit: Wired and Wireless Components for Rapidly Prototyping Interactive Devices", *Proceedings of the ACM Symposium on Designing Interactive Systems (DIS)*, August 2004

Fogarty, J., Hudson, S., Atkeson, C., Avrahami, D., Forlizzi, J., Kiesler, S., Lee, J., and Yang, J., "Predicting Human Interruptibility with Sensors", *ACM Transactions on Computer Human Interaction*, 2004.

Hudson, S., Fogarty, J., Atkeson, C., Avrahami, D., Forlizzi, J., Kiesler, S., Lee, J., and Yang, J., "Predicting Human Interruptibility with Sensors: A Wizard of Oz Feasibility Study", *Proceedings of ACM SIGCHI Conference on Human Factors in Computing Systems*, April 2003.

Forlizzi, J., Lee, J., and Hudson, S., "The Kinedit System: Affective Messages Using Dynamic Texts" *Proceedings of SIGCHI Conference on Human Factors in Computing Systems*, April 2003.

Lee, J., Forlizzi, J., and Hudson, S., "The Kinetic Typography Engine: An Extensible System for Animating Expressive Text", *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, October 2002.

Teaching Experience

Course Instructor

Course: Electronics Prototyping for HCI – Spring 2006

- Created a new half-semester course aimed at providing students with the core relevant skills in developing custom electronic devices. The course covered basic electronics, use of the PIC microcontroller, PCB design, and circuit fabrication. My responsibilities involved all aspects of the course from curriculum development, course and lecture materials, course lectures, and project assistance. Evaluation as instructor from the students: 4.2/5

Teaching Assistant

Course: Physical Computing – Spring 2005

- Setup lab equipment, assisted in lectures, and assisted students in a semester long projected oriented electronics prototyping course involving students in HCI, design, and art. The class involved weekly status report and project critiques. I assisted students both in and out of class time to aid them in their electronics projects using the Basic Stamp platform.

Teaching Assistant

Course: Mobile Computing – Fall 2005

- Primary responsibility involved designing HCI focused projects for Intel Research Pittsburgh. These projects covered common HCI methods such as internet based surveys, cognitive walk throughs, contextual inquiries, and ethnographies. The result of the project containing both qualitative and quantitative data and was very well received by the Intel researchers and the students were extremely positive regarding their experience in the project.

Online Tutorials

- Created a series of online educational tutorials which have in total reached over 4 million views (as of 1/1/08) on interaction techniques using the Nintendo Wii remote and creating a low-cost camera stabilizer. These tutorials introduce simple research concepts that could be easily performed by millions of individuals. The software for these tutorials has been downloaded over 200,000 times and over 6,000 related hardware units have been sold.

Patents – Issued and Published Applications

United States Patent: 7,001,023

Title: *Method and system for calibrating projectors to arbitrarily shaped surfaces with discrete optical sensors mounted at the surfaces*

Inventors: Lee, Johnny Chung; Maynes-Aminzade, Dan; Dietz, Paul H; Raskar, Ramesh

Assignee: Mitsubishi Electric Research Laboratories, Inc. (Cambridge, MA)

European Patent: 04771389.6-2202-JP2004011402

Title: Method and system for determining correspondence between locations on display surface having arbitrary shape and pixels in output image of projector

Proprietor: Mitsubishi Denki Kabushiki Kaisha

European Patent: 04799563.4-JP2004016625

Title: Method for determining location on display surface and interactive display system

Proprietor: Mitsubishi Denki Kabushiki Kaisha

United States Patent Application: 20050099405

Title: *Light pen system for pixel-based displays*

Inventors: Dietz, Paul H.; Leigh, Darren L.; Raskar, Ramesh; Lee, Johnny Chung

United States Patent Application: 20050248549

Title: *Hand-held haptic stylus*

Inventors: Dietz, Paul H. ; Leigh, Darren L. ; Yerazunis, William S.; Lee, Johnny Chung

United States Patent Application: 20060170871

Title: *Anti-blinding safety feature for projection systems*

Inventors: Dietz, Paul H.; Lee, Johnny Chung

United States Patent Application: 20070185697

Title: *Using electroencephalograph signals for task classification and activity recognition*

Inventors: Tan, Desney; Lee, Johnny Chung

Selected Press Coverage and Recognition of My Work

\$14 Steadycam

- Over 1.1 million unique views as of 1/8/08 not including print and internet syndication.
- "\$14 Video Camera Stabilizer" Make Magazine article included in *Design Life Now Triennial 2006*, Smithsonian, Cooper-Hewitt National Design Museum. New York, NY., 2006-2007
- Invited Article "\$14 Video Camera Stabilizer" *Make Magazine*. Volume 01: Make Premiere, Jan 2005
- "Make Magazine: Premier Issue" *Ars Technica*, March 27th, 2005
- "Build Your Own Steadicam" *Slashdot*, April 9th, 2004
- "\$14 DIY Steady-cam" *Engadget*, April 9th, 2004

Wii Remote Interaction

- Over 3.3 million unique views and 300,000 software downloads as of 1/8/08.
- Top Rated Video (All Time) *YouTube*, Dec 2007 for "Head Tracking for Desktop VR using the WiiRemote"
- "Work your Wiimote with Your Finger Tips" *Engadget*, Nov 11th, 2007
- "Multitouch Without Touch Using Wiimote" *Slashdot*, Nov 12th, 2007
- "Wiimote Repurposed for multi-point Interactive Whiteboard" *Engadget*, Dec 10th, 2007
- "How to hack a multitouch display out of a Wiimote" *Ars Technica*, Dec 10th, 2007
- "DIY head-tracker takes Wiimote hacking to dizzying new heights" *Engadget*, Dec 21st, 2007

- "Head Tracking with the Wiimote" *Slashdot*, Dec 23rd, 2007

Low-Cost EEG for Task Classification

- "Meet the life Hackers" *New York Times Magazine*, Oct 16th 2005
- "Invention – Microsoft Mind Reader" *New Scientist*, Oct 15th, 2007
- "Microsoft want to read your brain" *Slashdot*, Oct 15th, 2007
- "Microsoft reading minds to improve UIs" *Engadget*, Oct 16th, 2007

Automatic Projector Calibration

- "DIY'er gets busy with automatic projector calibration." *Engadget*, Nov 2007.

Scientific Community Involvement

Invited reviewer for the following conferences: SIGGRAPH 2004, Symposium on User Interface Software and Technology (UIST) 2002-07, SIGCHI 2002-2008.

Funding

Through my projects and research, I have obtained over \$600,000 in licensing fees and sales revenue for their respective institutions.

Other Noteworthy Recognition and Experience

Founder/Owner, Little Great Ideas, LLC. Fall 2004-Present.

- Established small business for the manufacturing and sale of hardware related components of my projects. Since it was established, it has performed over \$250,000 in gross sales.

Project Creator, Community Splash. May 2005.

- Conceived and executed a large scale community art project for the City of Pittsburgh for the urban renewal initiative of the East Liberty area. The project involved the construction of a 45 foot tall slingshot to launch paint-filled balloons fired by community to temporarily transform a condemned apartment building into an 18-story tall piece of artwork.

2nd Place, Pittsburgh Filmmakers Film-Kitchen Festival, Pittsburgh, PA., 2003.

Best of Show, Vinegar Hill Film Festival, Charlottesville, VA., 2000.

2nd Place, Virginia Power Electric Vehicle Commercial Competition, 1996

Syndicated Documentary, "Matthew Brady". Henrico Country Public Education Channel, 1996.