

## MY PHD TOPIC: HUMAN ACTUATION

My research is about advancing immersion. Today, users see and hear virtual worlds; I want users to also feel virtual worlds. The main challenge I am tackling is that such large-scale force feedback traditionally requires big machinery, such as industrial robots. The key idea behind my research is to bypass this machinery by instead leveraging human power. I thus create software systems that orchestrate humans in doing such mechanical labor--this is what I call **human actuation**.

## EDUCATION

Ph.D., Human-Computer Interaction, <i>Hasso Plattner Institute</i> , Potsdam, Germany Advisor: Patrick Baudisch	11/2012 – present
M.S., Computer Science, <i>National Taiwan University</i> , Taipei, Taiwan Advisor: Mike Y. Chen GPA: 92.32/100	02/2010 – 07/2010 09/2011 – 11/2012
B.S., Computer Science, <i>National Chiao Tung University</i> , Hsinchu, Taiwan GPA: 95.1/100 (major), Rank 3/56	09/2006 – 01/2010

## INTERSHIPS AT RESEARCH LABS

Research Intern, <i>Microsoft Research Redmond</i> <ul style="list-style-type: none"><li>With Eyal Ofek, Christian Holz, Andy Wilson</li></ul>	01/2018 – 04/2018
Research Intern, <i>Microsoft Research Redmond</i> <ul style="list-style-type: none"><li>With Eyal Ofek, Christian Holz, Hrvoje Benko, Andy Wilson</li><li>Built a system that uses a hemisphere prop to provide touch feedback in VR</li></ul>	05/2016 – 08/2016
Interaction Architecture Intern, <i>Apple Inc.</i> <ul style="list-style-type: none"><li>With Sean Kim and Camille Moussette</li><li>Built tracking devices and designed 3D user interfaces.</li></ul>	10/2014 – 03/2015

## EARLIER WORK EXPERIENCES

Software Developer, <i>Wantoto Inc.</i> , www.wantoto.com <ul style="list-style-type: none"><li>Developed iOS apps and web applications on Google Cloud.</li></ul>	07/2011 – 07/2012
Chief Counselor, <i>R.O.C Army</i> , Compulsory Military Service, Taiwan	08/2010 – 07/2011
Network Test Engineer, <i>Network Benchmarking Lab</i> , www.nbl.org.tw <ul style="list-style-type: none"><li>Tested functionality, compatibility, and performance of switches and routers by simulating different protocol on Spirent SmartBits®.</li></ul>	07/2008 – 07/2010

# PUBLICATIONS

## CHI/UIST full papers

The ACM CHI (Conference on Human Factors in Computing Systems) and UIST (Symposium on User Interface Software and Technology) are the top tier conferences in Human-Computer Interaction (20-25% acceptance rate).

- [10] Lung-Pan Cheng, Li Chang, Sebastian Marwecki and Patrick Baudisch. iTurk: Turning Passive Haptics in Active Haptics by Making Users Reconfigure Props in Virtual Reality. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. ACM, New York, NY, USA.
- [9] Sebastian Marwecki, Maximilian Brehm, Lukas Wagner, Lung-Pan Cheng, Florian 'Floyd' Mueller and Patrick Baudisch. VirtualSpace - Overloading Physical Space with Multiple Virtual Reality Users. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. ACM, New York, NY, USA.
- [8] Lung-Pan Cheng, Sebastian Marwecki and Patrick Baudisch. Mutual Human Actuation. In *Proceedings of the 30th annual ACM symposium on User interface software and technology (UIST '17)*. ACM, New York, NY, USA, 797-805. **[Full paper also received best demo award for accompanying demo]**
- [7] Lung-Pan Cheng, Eyal Ofek, Christian Holz, Hrvoje Benko, and Andrew D. Wilson. 2017. Sparse Haptic Proxy: Touch Feedback in Virtual Environments Using a General Passive Prop. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 3718-3728.
- [6] Pedro Lopes, Sijing You, Lung-Pan Cheng, Sebastian Marwecki, and Patrick Baudisch. 2017. Providing Haptics to Walls & Heavy Objects in Virtual Reality by Means of Electrical Muscle Stimulation. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. ACM, New York, NY, USA, 1471-1482.
- [5] Lung-Pan Cheng, Thijs Roumen, Hannes Rantzsch, Patrick Schmidt, Sven Köhler, Robert Kovacs, Johannes Jasper, Jonas Kemper, Patrick Baudisch. TurkDeck: Physical Virtual Reality Based on People, in *Proceedings of the 28th annual ACM symposium on User interface software and technology (UIST '15)*. Charlotte NC (November 8-11, 2015). ACM, New York, NY, USA. 417-426.
- [4] Lung-Pan Cheng, Patrick Lühne, Pedro Lopes, Christoph Sterz, Patrick Baudisch, Haptic Turk: a Motion Platform Based on People, in *Proceedings of the 2014 annual conference on Human factors in computing systems (CHI '14)*. Toronto, Canada (April 26-May 1, 2014). ACM, New York, NY, USA. 3463-3472.
- [3] Lung-Pan Cheng, Hsiang-Sheng Liang, Che-Yang Wu, Mike Y. Chen, iGrasp: Grasp-based Adaptive Keyboard for Mobile Devices, in *Proceedings of the 2013 annual conference on Human factors in computing systems (CHI '13)*. Paris, France (April 27-May 2, 2013). ACM, New York, NY, USA, 3037-3046.
- [2] Lung-Pan Cheng, Fang-I Hsiao, Yen-Tin Lin, Mike Y. Chen, iRotate: Automatic Screen Rotation based on Face Orientation, in *Proceedings of the 2012 annual conference on Human factors in computing systems (CHI '12)*. Austin, TX, USA (May 5-10, 2012). ACM, New York, NY, USA, 2203-2210.
- [1] Neng-Hao Yu, Li-Wei Chan, Seng Yong Lau, Sung-Sheng Tsai, I-Chun Hsiao, Fang-I Hsiao, Lung-Pan Cheng, Mike Y. Chen, Polly Huang, Yi-Ping Hung, TUI: Enabling Tangible Interaction on Capacitive Multi-touch Displays, in *Proceedings of the 2011 annual conference on Human factors in computing systems (CHI '11)*. Vancouver, BC, Canada (May 7-12, 2011). ACM, New York, NY, USA, 2995-3004.

## CHI/UIST short papers

- [2] Dominik Schmidt, Robert Kovacs, Vikram Mehta, Udayan Umapathi, Sven Köhler, Lung-Pan Cheng, Patrick Baudisch, Level-Ups: Motorized Stilts that Simulate Stair Steps in Virtual Reality, in *Proceedings of the 2015 annual conference on Human factors in computing systems (CHI '15)*. Seoul, Korean (April 18 - 23, 2015). ACM, New York, NY, USA. 2157-2160

- [1] [Lung-Pan Cheng](#), Fang-I Hsiao, Yen-Tin Lin, Mike Y. Chen, iRotateGrasp: Automatic Screen Rotation based on Grasp of Mobile Devices, in *Proceedings of the 2013 annual conference on Human factors in computing systems (CHI '13)*. Paris, France (April 27-May 2, 2013). ACM, New York, NY, USA, 3051-3054.

## AWARD AND SCHOLARSHIPS

- Best Demo Award, Mutual Human Actuation, UIST 2017
- Studying Abroad Scholarship (**US\$ 32,000**), Ministry of Education, Taiwan, 2015
- Conference Grant (**NT\$ 40,000**), National Science Council, Taiwan, 2012
- Conference Grant (**NT\$ 40,000**), The Advancement of Outstanding Scholarship, Taiwan, 2012
- **1st place (NT\$ 20,000)**, Wargame Competition, Hacks in Taiwan Conference, Taiwan, 2012
- **1st place (NT\$300,000)**, Chung Hua Telecom Mobile Apps Competition, Taiwan, 2010
- Lin Hsiung Chen scholarship (**NT\$100,000**), Taiwan, 2009  
(**top 50** of all university students in Taiwan)
- TSMC scholarship (**NT\$100,000**), Taiwan, 2008  
(**top 3** of EECS students in National Chiao Tung University)
- 4 x Academic Achievement Awards (NT\$6,000), National Chiao Tung University, Taiwan, 2007-2009  
(**top 5%** in a class of 56 students)
- 4 x Core Curriculum Awards (NT\$6,000), National Chiao Tung University, Taiwan, 2007-2009  
(**top 5%** in Operating System, Algorithm, Assembly Language and Linear Algebra)

## INVITED TALKS

- DUB Lunch Seminar, University of Washington, 2016
- Natural Interaction Group, Microsoft Research, 2016

## ADVISING

- Lily Chang, Summer Intern (3 months full time), 2017
- Tim Oesterreich, Project Seminar (1 semester), 2016
- Tobias Zagorni, Project Seminar (1 semester), 2016
- Felix Leupold, Master Thesis (6 months full time), 2014
- Max Salminen, Master Project (1 semester), 2014
- Hannes Rantzsch, Master Project (1 semester), 2013
- Patrick Schmidt, Master Project (1 semester), 2013

## TEACHING

- Teaching Assistant, Building Interactive Devices (undergraduate-level), taught by Prof. Patrick Baudisch at Hasso Plattner Institute, 2014-2017
  - o Lectured "Introduction to Programming for Virtual Reality & Games" (3h, in class programming, bachelor-level)

## REVIEWING

- CHI 2014, 2015, 2016, 2017, 2018
- UIST 2014, 2015, 2016, 2017, 2018
- TEI 2018
- VRST 2017
- World Haptics 2016
- Mobile HCI 2013
- SIGGRAPH Asia 2013

## PROFICIENCY

- Programming languages: C/C++, C#, Objective-C, Python, Javascript, PHP SQL
- Unity 3D apps and plugins (Windows, OSX, iOS) development
- Hardware prototyping (Arduino, Processing, PCB design, soldering, laser cutting)
- Tracking system (Vive, OptiTrack and IMU data processing)
- iOS app, tweak (jailbroken app) and external device communication