Yen-Chia Hsu

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Biography

I am a PhD candidate in the CREATE Lab in the Robotics Institute at Carnegie Mellon University. My recent research focuses on the design, implementation, and evaluation of civic technologies (information technology for public good). I develop interactive systems and applications which integrate artificial intelligence, crowdsourcing, and data visualization techniques to support citizen empowerment.

Research Interests

Civic Technology / Citizen Science	Interactive Data Visualization and Storytelling
Human Computation and Crowdsourcing	Machine Learning / Computer Vision

Education

Carnegie Mellon University, Pittsburgh, USA　　　　　　2014/09 - 2018/05 (expected)
Ph.D. in Robotics
Advisor: Illah R. Nourbakhsh
Thesis: Design Data Visualization and Crowdsourcing Systems in Community-Based Citizen Science

Carnegie Mellon University, Pittsburgh, USA　　　　　　2011/09 - 2012/12
Master of Tangible Interaction Design (GPA: 3.72/4.0 overall)

National Cheng Kung University, Tainan, Taiwan　　　　　　2005/09 - 2010/06
Dual B.S. in Architecture, and in Computer Science (GPA: 87.89/100 overall)

Experiences

CREATE Lab, Robotics Institute, School of Computer Science, Carnegie Mellon University, USA
Ph.D. Student Researcher　　　　　　2014/09 - 2018/05 (expected)
Web Designer/Developer　　　　　　2013/10 - 2014/06
Research Associate　　　　　　2013/01 - 2013/06

Smell PGH: A Mobile Application to Crowdsource and Visualize Pollution Odors　　2017
I worked in a team to develop Smell Pittsburgh, a mobile application for citizens to report and track pollution odors. Smell reports are sent to the local health department as they are submitted. A map visualizes and animates the reports with air quality data and wind directions. (http://smellpgh.org)

Community-Empowered Air Quality Monitoring System [1][2]　　2015 - 2016
I worked with a local community in Pittsburgh to develop an air quality monitoring system, which integrated various data over a large spatial and temporal scale. The system afforded scientific evidence by using animated images, air quality data, and smell reports. (Top 5% Award in ACM CHI 2017)
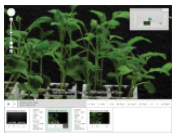
A Web-based Large-scale Timelapse Editor for Interactive Storytelling [3]　　2014
Based on the timelapse viewer, I developed a storytelling tool that operates along multiple dimensions: geolocation, time, and scale. Users can use it to create interactive slideshows or guided tours, and then embed or share them on social media for telling interactive stories. (IEEE VIS Poster)

Earth Timelaspe Viewer Visualizing Landsat Satellite Imagery　　2013
I worked in a team to develop a timelapse viewer over spacetime with billions of pixels. We released an Earth timelapse viewer consisting of 33 cloud-free mosaics of the planet from 1984 to 2016 Landsat data with Google and TIME. (http://world.time.com/timelapse, Webby People's Voice Award 2014)
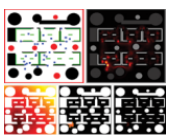
Code Lab, School of Architecture, College of Fine Arts, Carnegie Mellon University, USA
Master Student　　　　　　2011/09 - 2012/12
Lab Assistant　　　　　　2011/09 - 2012/05

**SimArch: A Multi-Agent System for Human Path Simulation**　　2012
SimArch uses Markov Decision Process to build a behavior model. The model simulates simple mental states, target range detection, and collision prediction when agents behave in a museum. SimArch outputs the prediction of how likely a person will occur in a location after simulation.
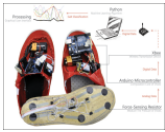
SENSEable Shoes: Hands-Free and Eyes-Free Mobile Interaction   2012

SENSEable Shoes is a platform for interaction designers to create applications. It recognizes low-level activities by measuring the weight distribution over the feet with sensors embedded in the shoe pad. A Support Vector Machine classifier identifies mobile activities and foot gestures.
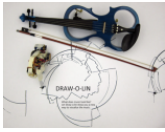
Draw-o-lin: A Music Visualizer for Violin   2011

What does music look like? Draw-o-lin is an interactive mobile robot visualizing music by drawing graphs on a paper according to various sound properties. Violin performers control Draw-o-lin robot by playing higher or lower pitches, alternating the volume, and changing the tempo of the music.

IA Lab, Department of Architecture, National Cheng Kung University, Taiwan

Research Assistant   2010/09 - 2011/06
Digital Fabrication Factory Administrator   2008/09 - 2011/06

SynTag: A Web-based Platform for Labeling Real-time Video [4][5]   2010

Users can label Good, Question, and Disagree tags in real or non-real time with visualization of time-stamp video previews on an interactive timeline. SynTag creates thumbnails by using real-time tags for presenters to receive instant feedback and for others to retrieve videos. (ACM CSCW 2012)

Publications

[1] **Yen-Chia Hsu**, Paul Dille, Jennifer Cross, Beatrice Dias, Randy Sargent, and Illah Nourbakhsh. 2017. Community-Empowered Air Quality Monitoring System. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI 2017). ACM. [Top 5% Honorable Mention Award]

[2] **Yen-Chia Hsu**, Paul Dille, Randy Sargent, and Illah Nourbakhsh. 2016. Industrial Smoke Detection and Visualization. tech. report CMU-RI-TR-16-55, Robotics Institute, Carnegie Mellon University, September, 2016.

[3] **Yen-Chia Hsu**, Paul Dille, Randy Sargent, Christopher Bartley, and Illah Nourbakhsh. 2015. A Web-based Large-scale Timelapse Editor for Creating and Sharing Guided Video Tours and Interactive Slideshows. IEEE Information Visualization Posters, 2015.

[4] **Yen-Chia Hsu**, Tay-Sheng Jeng, Yang-Ting Shen, and Po-Chun Chen. 2012. SynTag: A Web-based Platform for Labeling Real-time Video. In Proceedings of the ACM 2012 Conference on Computer Supported Cooperative Work (CSCW 2012). ACM.

[5] Yang-Ting Shen, Tay-Sheng Jeng, **Yen-Chia Hsu**. 2011. A "Live" Interactive Tagging Interface for Collaborative Learning. In: Luo Y. (eds) Cooperative Design, Visualization, and Engineering. CDVE 2011. Lecture Notes in Computer Science, vol 6874. Springer, Berlin, Heidelberg

Skills

Programming languages: MATLAB, Python, HTML, CSS, JavaScript
Design tools: Adobe Photoshop/Illustrator/Premiere, AutoCAD, 3DsMax, Arduino

Professional Activities

Program Committee: TAICHI 2017
Reviewer: IEEE Robotics and Automation Magazine 2015
Conference Presenter: ACM CHI 2017, A&WMA 2017, ACM CSCW 2012
Invited Speaker: Google Earth Engine User Summit 2015, Bloomberg Philanthropies 2017

Honors & Awards

Top 5% Honorable Mention Paper Award, ACM CHI, USA   2017
Webby People's Voice Award, USA   2014
Best New Artist, The National Golden Award for Architecture, Taiwan   2009
Third Prize, National Country House Design Competition, Ministry of the Interior, Taiwan   2008
Outstanding Student Academic Achievement, National Cheng Kung University   2005, 2006, 2007

Leadership

Department of Architecture, National Cheng Kung University, Taiwan

General Coordinator, Graduation Design Preparation Committee   2009
Director of General Affairs, Student Committee   2008
Class Representative   2007

Teaching

Robotics Institute, School of Computer Science, Carnegie Mellon University, USA

Teaching Assistant of 16-811 Math Fundamentals for Robotics   2015