

# Chih-Pin Hsiao, Ph.D.

Human Computer Interaction Researcher, Lead Software Engineer

Nemetschek Vectorworks

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## Professional Experience

**Lead Software Engineer in R&D User Interaction / *Nemetschek Vectorworks*** **Sep 2017 ~ Current**

- Lead a team of software engineers designing and implementing the interactive software solution that renders 2D and 3D graphics from the same model/data in different views simultaneously.
- Implement high-performance parallel computing algorithms that render 2D and 3D graphics efficiently
- Research and prototype in WASM with WebGL that will be used in the future releases of the software

**R&D Software Engineer in Interaction / *Nemetschek Vectorworks*** **Dec 2015 ~ Sep 2017**

- Research, Design and Implement 2D/3D interaction technologies for one of the industrial leaders in creative and design software industry

**HCI Research Associate / *HP Labs*** **May 2014 ~ Aug. 2014**

- Conceptualized, designed, and implemented innovative gestural interactions for multi-display and VR devices
- Adopted agile and rapid prototyping methods in multi-discipline environment with a panel of senior research scientists that led to four pending patents related to gesture interactions and recognitions.

**HCI Research Intern / *GE Global Research Software Center*** **May 2013 ~ Dec. 2013**

- Designed and implemented visualization algorithms and libraries (mainly in d3.js with Node.js) critical for systems used to demonstrate innovative GE technology to customers and the media
- Led the front-end development of a multi-screen multi-touch input visualization technology resulting in a patent application.

**Graduate Research Assistant / *Georgia Tech*** **Sep 2010 ~ Fall. 2015**

- Designed 7 studies with more than 100 participants on wearable technologies and natural user interfaces resulting in more than 30 publications with more than 10 research collaborators
- Managed and supervised 16 students on multiple projects in Health System Institute exploring novel input methods and interaction designs for medical usages leading to publications in wearable computing, gestural interactions, multi-touch inputs, and multi-screen inputs.
- Appeared on [Communications of ACM](#), [NPR News Atlanta](#), and [Georgia Tech News](#)

**Senior Software Engineer / *Digital Alchemy*** **Sep 2008 ~ May 2013**

- Worked with the Lawrence Berkeley National Laboratory developing commercial 3D modeling and simulation software called [Simergy](#) for improving the design of energy efficient buildings
- Researched user experience workflows, designed user personas, and developed low- and high-fidelity wireframes and information architecture for various software projects, e.g. [Simergy](#)

## Education

- 2010 ~ 2015 Ph.D. in Design Computing / HCI Georgia Institute of Technology (GPA 4.0/4.0)  
Committee: Prof. Ellen Y. Do (Advisor), Chuck M. Eastman, Mark D. Gross, James Foley, Baabak Ashuri
- 2007 ~ 2009 Master of Science in Design Computing / HCI, University of Washington (GPA 3.9/4.0)
- 2000 ~ 2004 B.S. in Architecture, Department of Architecture, National Cheng Kung University

## Technical & HCI Skills

### Main Computer Programming Languages

C++, C#, JavaScript, JAVA, HTML5, Python, CSS, PHP, Visual Basic, C

### Selected Frameworks, Libraries, and Tools

OpenGL, Parasolid, d3.js, Unity3D, Node.js, WASM, Weka Machine Learning, TensorFlow, OpenCV, Kinect SDK, OpenNI, Adobe Creative Suite, 3Ds Max, Rhinoceros 3D, V-Ray, AutoCAD, Revit, Vectorworks

### HCI Research Methods

Experimental Design, User Studies, Semi-Structured Interviews, Qualitative Data Analysis (Grounded Theory, Thematic Analysis), Quantitative Data Analysis (Statistical Analysis, Machine Learning, Visual Analytics)

## Peer Review Publications

- Davis, N., **Hsiao, C.-P.**, Kunwar, Y. S., Lin, B., Magerko, B., Creative Sense-Making: Quantifying Interaction Dynamics in Co-Creation. *In the Proc. ACM Creativity and Cognition 2017* (Singapore), 356-366 (**Best Paper Award**)
- Kunwar, Y. S., Davis, N., **Hsiao, C.-P.**, Magerko, B., Unified Classification and Generation Networks for Co-Creative Systems. *In the Proc. ICCV 2017* (Atlanta, GA)
- Kunwar, Y. S., Davis, N., **Hsiao, C.-P.**, Magerko, B., Recognizing Actions in Motion Trajectories Using Deep Neural Networks. *In the Proc. AAAI AIIDE 2016* (San Francisco, CA), 211-217
- Davis, N., **Hsiao, C.-P.**, Kunwar, Y. S., Magerko, B., Co-Creative Drawing Agent with Object Recognition. *In the Proc. AAAI AIIDE 2016* (San Francisco, CA), 9-15
- Davis, N., **Hsiao, C.-P.**, Kunwar, Y. S., Li, L., Magerko, B., Empirically Studying Participatory Sense-Making in Abstract Drawing with a Co-Creative Cognitive Agent. *In the Proc. ACM IUI 2016* (Sonoma, CA), 196-207
- Li, R., Wang, Y. **Hsiao, C.-P.**, Davis, N., Hallam, J., and Do, E. Y.-L., Tactile Teacher: Enhancing Traditional Piano Lessons with Tactile Instructions. *In the Proc. ACM CSCW 2016* (San Francisco, CA), 329-332
- Hsiao, C.-P.**, SolidSketch – Toward Enactive Interactions for Semantic Model Creation. *In the Proc. ACM Creativity and Cognition 2015* (Glasgow, Scotland), 329-330
- Davis, N., Comerford, M., Jacob, M., **Hsiao, C.-P.**, Magerko, B., An Enactive Characterization of Pretend Play. *In the Proc. ACM Creativity and Cognition 2015* (Glasgow, Scotland), 275-284
- Davis, N., **Hsiao, C.-P.**, Singh, K.Y., Li, L., Moningi, S., Magerko, B., Drawing Apprentice – An Enactive Co-Creative Agent for Artistic Collaboration. *In the Proc. ACM Creativity and Cognition 2015* (Glasgow, Scotland), 185-186
- Hsiao, C.-P.**, Li, R., Yan, X., and Do, E. Y.-L., Tactile Teacher – Sensing of Fingering in Piano Playing. *In the Proc. Tangible Embedded and Embodied Interactions 2015* (Stanford, California), 257-260

Davis, N., Popova, Y., Sysoev, I., **Hsiao, C.-P.**, Zhang, D., & Magerko, B. Building Artistic Computer Colleagues with an Enactive Model of Creativity, *In the Proc. ICCO 2014*. (Ljubljana, Slovenia), 38-45

Wu, Andy C.-S **Hsiao, C.-P** Waqas, J. Cheng, N. Lin, J., Interactive Visual Data Exploration Solutions for Industrial Systems, *In the Proc. of IEEE Vis 2013* (Atlanta).

**Hsiao, C.-P.** Davis, N. Chen, S. Sun, B. Chen, R. and Do, Ellen Y.-L., Sketch Master – A Sketch Game for Collecting Exploratory Data, *In the Proc. of Creativity and Cognition 13'* (Sydney), 320-323

Zhao, C. **Hsiao, C.-P.** and Do, Ellen Y.-L., Tangible Games for Stroke Rehabilitation with Digital Box and Blocks Test, *In the Proc. of CHI EA 13'* (Paris, France), 523-528.

**Hsiao, C.-P.**, Zhao, C. Do, and Ellen Y.-L., The Digital Block and Box Test – Automating Traditional Post-Stroke Rehabilitation Assessment, *In the Proc. of IEEE PerCom 13'* (San Diego, CA), 360-363.

**Hsiao, C.-P.**, Davis, N. and Do, Ellen Y.-L., Dancing on the Desktop - Gesture Modeling System to Augment Design Cognition, *In the Proc. of ACADIA 12'* (San Francisco, CA), CuminCAD. 419-428.

**Hsiao, C.-P.** Gesture modeling: improving spatial recognition in architectural design process, *In the Proc. of Creativity and cognition 2011'* (Atlanta, GA), 457-458.

**Hsiao, C.-P.** Johnson, B. R. TiMBA -- Tangible User Interface for Model Building and Analysis. Human-Computer Interaction in Lecture Notes in Computer Science (2011), 6762, 43-52.

**Hsiao, C.-P.** Johnson, B. R. Combine Digital & Physical with Vision-Based Tangible User Interfaces. *In the Proceedings of CAAD Futures 2011'* (Liege, Belgium). 785-800.

Fritz, R. **Hsiao, C.-P.**, and Johnson, R. B. Gizmo & WiiView. *In the Proc. of ACADIA 2009 reForm* (Chicago). pp. 278-280.

## Book Chapter, Journal Papers, and Dissertation

Davis, N., **Hsiao, C.-P.**, Kunwar, Y. S., Magerko, B., (2017) Quantifying Collaboration with a Co-Creative Drawing Agent, *ACM Transactions on Interactive Intelligent Systems (TiIS) 7* (4), 19.

**Hsiao, C.-P.** *Toward Semantic Model Generation from Sketch and Multi-touch Interactions*. Ph.D. Dissertation. Georgia Institute of Technology 2016.

Davis, N. **Hsiao, C.-P.** (2015) An Enactive Model of Creativity for Computational Collaboration and Co-creation. *In Creativity in the Digital Age*, Springer. pp. 109-133.

Kim, H. **Hsiao, C.-P.** and Do, Ellen Y.-L. (2012) Home-based Computerized Cognitive Assessment Tool for Dementia Screening, *The Journal of Ambient Intelligence and Smart Environments*. pp. 429 - 442.

**Hsiao, Chih-Pin.** *Vision-based Tangible User Interfaces for Architecture*. Master Thesis. University of Washington, 2009.

## Patents

**Hsiao, C.P.**, Cook, G.W., Wei, J., Vankipuram, M., Chang, N. L., Hewlett-Packard Development Co LP 2017, *3D NAVIGATION MODE*. US Patent US 10275113 B2

Cook, G.W., **Hsiao, C.P.**, Wei, J., Vankipuram, M., Chang, N. L., Hewlett-Packard Development Co LP 2017, *COLLABORATION WITH 3D DATA VISUALIZATIONS*. US Patent US 10359905 B2

Cook, G.W., **Hsiao, C.P.**, Wei, J., Vankipuram, M., Chang, N. L., Hewlett-Packard Development Co LP 2017, *GESTURE LIBRARY*. US Patent WO2016099561A1

**Hsiao, C.P.**, Cook, G.W., Wei, J., Vankipuram, M., Chang, N. L., Hewlett-Packard Development Co LP 2017, *3D VISUALIZATIONS*. US Patent WO2016099556A1

Wu, C.S., **Hsiao, C.P.**, Lin, J.W., Cheng, N. and Javed, W., GENERAL ELECTRIC COMPANY, 2016. *INTELLIGENT QUERY FOR GRAPHIC PATTERNS*. U.S. Patent 20,160,063,108.

## Activities

- IEEE Student Member
- ACM Student Member
- Served as Organizing Committee for Co-Creative workshop at ICCV 17'
- Served as Program Committee for BodySenseUX workshop at UbiComp 15'
- Serve as Workshop Organizer for NUS – GA Tech wearable computing workshops (14', 15')
- Served as Student Volunteer for ACM TEI 15'
- Served as reviewer for Design Scripting with Revit/Dynamo and Python class in Fall 2014
- Served as reviewer for Interactive and Wearable Product Design class in Fall 2014
- Served as reviewer for Chinese CHI 2015', 2014'
- Served as reviewer for ACM TEI 2015'
- Served as reviewer for ACM CHI 2020', 2015' and 2013'
- Served as reviewer for ACM DIS 2014'
- Participate the Graduate Consortium session in ACM C&C 11'
- Served as reviewer for ACM C&C 11'

## Students Mentored

David Park	M.S. in Human Computer Interactions, class of 2011
Binjie Sun	Master in Industrial Design, class of 2012
Richard Li	B.S. in Computer Science, class of 2012
Samantha Wang	M.S. in Electrical Engineering, class of 2013
Xinyan Yan	PhD in Computer Science, class of 2015
Zhao Chen	Visiting student (currently attending PhD at University of Washington)
Takahiro Ito	Visiting student

## Honor, Awards, Scholarships

- 2017 ACM C&C Best Paper Award
- 2013 Selected as IEEE PerCom conference student scholarships
- 2012 Selected as ACADIA conference student scholarships
- 2010 Awarded by Google Device Seeding Program for Top Android Market Developers
- 2003 Selected as NCKU Chinese Outstanding College Youths of 2003
- 2003 Awarded as First Class Honor when leading NCKU Winds Orchestra in National Music Competition