

Donghao Ren

Ph.D. Candidate

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RESEARCH INTERESTS

My research interests are in information visualization, machine learning, and virtual / augmented reality. Specifically, I have been working on visualization tools and libraries, as well as visualizations in immersive environments. I'm also very interested in machine learning and have worked on interactive performance visualizations for diagnosing machine learning models.

EDUCATION

University of California, Santa Barbara

Fall 2013 – present

- Ph.D. Candidate in Computer Science
- Committee: Prof. Tobias Höllerer (Chair), Prof. Matthew Turk, Prof. George Legrady, and Dr. Bongshin Lee

Peking University

Fall 2009 – Spring 2013

- Bachelor of Science in Intelligence Science and Technology
- Advisor: Prof. Xiaoru Yuan

RESEARCH EXPERIENCE

Four Eyes Lab, Research Assistant

Fall 2013 – present

- University of California, Santa Barbara, United States
- Advisor: Prof. Tobias Höllerer

Microsoft Research, Research Intern

Summer 2015, 2016, 2017

- Microsoft Corporation, United States
- Mentor: Saleema Amershi (2015), Bongshin Lee (2016, 2017)

Visualization and Visual Analytics Group, Undergraduate Research Assistant

Spring 2012 – Summer 2013

- Peking University, Beijing, China
- Advisor: Prof. Xiaoru Yuan

PUBLICATIONS

- **Donghao Ren**, Bongshin Lee, and Matthew Brehmer, "Charticulator: Interactive construction of bespoke chart layouts," *IEEE Transactions on Visualization and Computer Graphics (InfoVis '18)*, vol. 25, no. 1, 2019
Best Paper Honorable Mention Award
- **Donghao Ren**, Bongshin Lee, Matthew Brehmer, and Nathalie Henry Riche, "Reflecting on the evaluation of visualization authoring systems," in *Workshop Proceedings of BELIV 2018: Evaluation and Beyond – Methodological Approaches for Visualization*, 2018
- **Donghao Ren**, Bongshin Lee, and Tobias Höllerer, "Stardust: Accessible and transparent GPU support for information visualization rendering," *Computer Graphics Forum (EuroVis '17)*, vol. 36, no. 3, pp. 179–188, 2017
- **Donghao Ren**, Matthew Brehmer, Bongshin Lee, Tobias Höllerer, and Eun Kyoung Choe, "ChartAccent: Annotation for data-driven storytelling," in *Proceedings of the IEEE Pacific Visualization Symposium*, 2017
- Jieliang Luo, **Donghao Ren**, and George Legrady, "Anamorphic fluid: Exploring spatial organization and movements of images in a simulated fluid environment," in *Proceedings of the 10th International Symposium on Visual Information Communication and Interaction*, ser. VINCI '17. New York, NY, USA: ACM, 2017, pp. 63–64
- **Donghao Ren**, Saleema Amershi, Bongshin Lee, Jina Suh, and Jason D. Williams, "Squares: Supporting interactive performance analysis for multiclass classifiers," *IEEE Transactions on Visualization and Computer Graphics (VAST '16)*, vol. 23, no. 1, 2017
- **Donghao Ren**, Tibor Goldschwendt, YunSuk Chang, and Tobias Höllerer, "Evaluating wide-field-of-view augmented reality with mixed reality simulation," in *Proceedings of the IEEE VR Conference*, 2016

- **Donghao Ren**, Tobias Höllerer, and Xiaoru Yuan, “iVisDesigner: Expressive interactive design of information visualizations,” *IEEE Transactions on Visualization and Computer Graphics (InfoVis '14)*, vol. 20, no. 12, 2014
- Xiaoru Yuan, Zuchao Wang, Zipeng Liu, Cong Guo, Hongwei Ai, and **Donghao Ren**, “Visualization of social media flows with interactively identified key players,” in *Proceedings the IEEE Conference on Visual Analytics Science and Technology (VAST '14)*, 2014
- **Donghao Ren**, Xin Zhang, Zhenhuang Wang, Jing Li, and Xiaoru Yuan, “WeiboEvents: A crowd sourcing weibo visual analytic system,” in *Proceedings of the IEEE Pacific Visualization Symposium (Notes)*, 2014, pp. 330–334
- Xiaoru Yuan, **Donghao Ren**, Zuchao Wang, and Cong Guo, “Dimension Projection Matrix / Tree: Interactive subspace visual exploration and analysis of high dimensional data,” *IEEE Transactions on Visualization and Computer Graphics (InfoVis '13)*, vol. 19, no. 12, 2013

RESEARCH PROJECTS

Charticulator

Summer 2017 – present

- A web-based tool that supports interactive design of custom and expressive visualizations without programming
- <https://charticulator.com/>
- **Best Paper Honorable Mention Award at InfoVis 2018**

Stardust

Summer 2016 – present

- A JavaScript library for GPU-accelerated rendering of information visualization
- <https://stardustjs.github.io/>

ChartAccent

Summer 2015 – Summer 2016

- A tool for creating data-driven annotations for visualizations
- <https://chartaccent.github.io/>

Squares: Interactive Performance Visualization for Multiclass Classifiers

Summer 2015

- A new visualization to help understanding multiclass classifier performance

Wide-Field-of-View Augmented Reality

Summer 2015

- A mixed-reality simulation framework for the UCSB AlloSphere
- Conducted a controlled user study with mixed-reality simulation to understand user performance on different field of views and tracking artifacts

iVisDesigner

Spring 2013 – Fall 2014

- A web-based system to enable expressive and interactive design of information visualizations
- <https://donghaoren.org/ivisdesigner/>

WeiboEvents: Visual Analytic System for Microblog Events

Spring 2012 – Summer 2018

- An online visual analytic system for public users to analyze retweeting cascades in Sina Weibo
- 5,254 users crawled and analyzed 35,053 cascades between Oct. 2013 and Oct. 2014
- Exhibited in the “GeoCity Smart City” International Information Design Exhibition
- <http://vis.pku.edu.cn/weibova/weiboevents/> (Chinese)

Dimension Projection-Matrix/Tree

Spring 2013

- An interactive subspace visual exploration system for analyzing high dimensional data

Visualization Assembly Line

Summer 2012

- A web-based collaborative multidimensional data visualization system
- **Best Poster Award at PacificVis 2013**

PERSONAL / COURSE PROJECTS

AlloVolume

Fall 2014 – Winter 2015

- A CUDA-based volume renderer for the UCSB AlloSphere, a full-surround multi-projector display environment

Predicting Retweet Count in Sina Weibo (Course: Advanced Data Mining)

Spring 2014

- Designed and evaluated features for predicting the number of retweets, using datasets from WeiboEvents

Multi-GPU Fluid Simulation With SPH (Course: Applied Parallel Computing)

Winter 2014

- A multi-GPU fluid simulation program that runs on Triton or Lonestar machines

Rendering 3D Paintings (Course: Computer Graphics)

Spring 2012

- A distributed mixed-order composition algorithm to render 3D paintings

KinectFusion Implementation

Fall 2011

- A 3D reconstruction program using depth images captured by the Kinect camera as inputs, using OpenCL GPU programming framework

XNAnalysis

Fall 2011

- An extension for the Google Chrome web browser to visualize egocentric social networks
- Published on renren.com (“Facebook in China”) and received 17,016 visits and 5,958 shares

PROFESSIONAL ACTIVITIES

Journal Paper External Reviewer

- IEEE Transactions on Visualization and Computer Graphics
- Journal of Visualization
- Computers & Graphics

Conference Paper External Reviewer

- InfoVis 2015, 2018
- VAST 2017, 2018
- EuroVis 2015, 2016
- PacificVis 2016 (2 papers)
- VRST 2016

Student Volunteer at IEEE VIS 2016

Fall 2016

TEACHING EXPERIENCE

Teaching Assistant

- UCSB CS8 – Introduction to Computer Science Fall 2013
- UCSB CS184 – Introduction to Mobile Application Development (using Android) Fall 2017

EXHIBITION

Anamorphic Fluid, in collaboration with George Legrady and Rodger Luo

2015

- Currents New Media Festival, Santa Fe, NM, 2017
- Dongdaemun Design Plaza Museum, Seoul, Korea, 2016
- Fellows of Contemporary Art, Los Angeles CA, 2016
- Edward Cella Art & Architecture, Los Angeles CA, 2015

SKILLS & INTERESTS

- Programming: C/C++, JavaScript/TypeScript/CSS/HTML/D3/React/WebGL, Python, R, TensorFlow, CUDA, OpenCL, OpenGL, Java, C#/VB.NET, PHP.
- Personal Interests: Landscape Photography (Gallery: <https://donghaoren.org/gallery/>), Piano, Classical Music, Electronics Design.