

# Xiaoyu Zhang

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## Education

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**Ph.D. Candidate:** Computer Science, University of California, Davis, USA    Sep. 2018 - present

- Research interests: Visual Analytics, Information Visualization, Human-Computer Interaction
- Advisor: Prof. Kwan-Liu Ma

**Master Degree:** Computer Science, Zhejiang University, Hangzhou, China    Sep. 2015 - Mar. 2018

- Research interests: Computer Graphics, Medical Image Processing
- Advisor: Prof. Kun Zhou, Prof. Zhong Ren

**Bachelor Degree:** Digital Media Art, Xiamen University, Xiamen, China    Sep. 2011 - Jun. 2015

- Major: Digital Media Art (GPA: 3.86 / 4.0)
- Minor: Advertising (GPA: 3.58 / 4.0)

## Research Interests

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- Visual Analytics, Information Visualization, Human-Computer Interaction

## Publications&Software Copyrights

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- 1 **Xiaoyu Zhang**, Jorge Henrique, Huan Song et al: *SliceTeller : A Data Slice-Driven Approach for Machine Learning Model Validation*, IEEE Transactions on Visualization and Computer Graphics  
🏆 Best Paper Honorable Mentioned Award on IEEE VIS 2022
- 2 **Xiaoyu Zhang**, Xiwei Xuan, Thurston Sexton et al: *LabelVizier: Interactive Validation and Relabeling for Technical Text Annotations from Weak Supervision*, submitted to PacificVis 2022.
- 3 Xiwei Xuan, **Xiaoyu Zhang**, Oh-Hyun Kwon, and Kwan-Liu Ma: *VAC-CNN: A Visual Analytics System for Comparative Studies of Deep Convolutional Neural Networks*, IEEE Transactions on Visualization and Computer Graphics 28, no. 6 (2022): 2326-2337.
- 4 **Xiaoyu Zhang**, Senthil Chandrasegaran, and Kwan-Liu Ma: *Conceptscope: Organizing and visualizing knowledge in documents based on domain ontology*, In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-13).
- 5 **Xiaoyu Zhang**, Takanori Fujiwara, Senthil Chandrasegaran et al. : *A Visual Analytics Approach for the Diagnosis of Heterogeneous and Multidimensional Machine Maintenance Data*, In 2021 IEEE 14th Pacific Visualization Symposium (PacificVis) (pp. 196-205).
- 6 Senthil Chandrasegaran, **Xiaoyu Zhang**, Michael P. Brundage et al. : *Using Text Visualization to Aid Analysis of Machine Maintenance Logs*, Model-Based Enterprise (MBE) Summit 2020.
- 7 Weiwei Cui, **Xiaoyu Zhang** et al. : *Text-to-Viz: Automatic Generation of Infographics from Proportion-Related Natural Language Statements*, IEEE Transactions on Visualization and Computer Graphics 26, no. 1 (2019): 906-916.
- 8 **Xiaoyu Zhang**, Yixiong Zheng, Bin Zheng: *Define Interior Structure for Better Liver Segmentation Based on CT Images*, In CCF Chinese Conference on Computer Vision, pp. 77-88. Springer, Singapore, 2017.
- 9 Yingying She, Qian Wang, **Xiaoyu Zhang** et al. : *The Approach of Micro-blog Explosive Events Detection and Analysis in Real-time*, International Conference on Computer Engineering and Information Systems. Atlantis Press, 2016.
- 10 Xiamen University. Micro-blog Explosive Events Detection and Analysis System V1.0. Registration No.: 2015SR218554.
- 11 Xiamen University. Micro-blog Explosive Events Detection and Analysis System (iOS Version) V1.0. Registration No.: 2015SR218546.

## Professional Experience

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- Research Data Scientist Intern in Infrastructure group, Meta    May 2022 - Present
- Research Intern in Visual Analytics & eXplainable AI group, Bosch Research    June 2021 - May 2022
- Research Intern in Visual Computing group, Microsoft Research Asia (MSRA)    May 2018 - Aug. 2018
- Intern of Senior Research & Development in Game Engine group, NetEase Games Corp.    Jan. 2017 - Mar. 2017
- Visiting Scholar in Surgical Simulation Research Lab, University of Alberta    Mar. 2016 - Sep. 2016
- Research Assistant in Department of Computer Science, Hong Kong University    July 2014 - Sep. 2014

## Service

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- Reviewer: ACM CHI 2023    Oct. 2022
- Reviewer: IEEE VIS 2022    May 2022
- Volunteer: [Bay Area Science Festival 2022](#)    April 2022

- President: ZJU Toastmasters Speech Club, [Toastmasters International](#) Jan. 2017 - June 2017
- Student Volunteer, [Siggraph Asia 2016](#) Dec. 2016

## Teaching

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- **Instructor:** ECS32B - Introduction to Data Structures (Undergraduate, Summer2022) Aug. 2022 - Sep. 2022
- **Guest Lecturer:** ECS289H - AI for Visualizing Data (graduate, Win2022) Jan. 2022 - Present
- **Teaching Assistant:** ECS32B - Introduction to Data Structures (Undergraduate, Fall2019) Sep. 2019 - Dec. 2019
- **Teaching Assistant:** ECS36C - Data Structures (Undergraduate, Spring2019) March. 2019 - June 2019
- **Teaching Assistant:** ECS32B - Introduction to Data Structures (Undergraduate, Win2019) Jan. 2019 - March 2019
- **Student Supervision and Mentoring:** Xiwei Xuan, Ph.D. Student, UC Davis June 2021 - Present

## Awards

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- Fall Graduate Studies Travel Award Sep. 2022
- 2022 GGCS Best Graduate Researcher Award (1 out of 320) June 2022
- Spring Graduate Studies Travel Award May 2022
- GGCS Graduate Program Fellowship 2020-21 Apr. 2021
- VMWare Excellent Student Fellowship Nov. 2017
- “Graduate of Merit/Triple A graduate” of Zhejiang University Nov. 2017
- “Award of Honor for Graduate” of Zhejiang University Nov. 2017
- Academic Scholarship of Zhejiang University Sep. 2015
- “Young Eagle Fellowship” of Xiamen University June 2015
- Second Prize of the Computer Software Design Contest of Fujian Province Dec. 2014
- Second Prize of the National College Artificial Intelligence Design Contest July 2014
- Meritorious Winner (First Prize) of American College Mathematical Contest in Modeling (MCM) 2014 Apr. 2014
- “Excellent Merit Student” of Xiamen University Dec. 2014
- “Jin Zhao fen & Cao Qianlong Fellowship” of Xiamen University Apr. 2013
- First Prize of the Outstanding Student Fellowship Oct. 2012

## Research Projects

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### A Visual Analytics Approach for Error Discovery, Explanation and Improvement of ML Training<sup>[1]</sup>

June 2021 - May 2021

*Research Work at Bosch Research* Pytorch, Pandas, Sklearn, Python, React, Flask, D3

- Introduced an explainable AI approach to find explainable and influential data slices for model validation in autonomous driving
- Optimized the robustness of the model in a slice-wise way following the idea of distributionally robust optimization (DRO)
- Developed a visual analytics system to present slice finding results and collect domain knowledge from domain expert

### Visual Analytics for Machine Maintenance Log<sup>[2][5]</sup>

Dec. 2019 - present

*Research Work at University of California, Davis* Sklearn, Python, Javascript, React, Flask, D3

- Introduced a visual analytics approach to analyze large, high-dimensional and heterogenous machine maintenance data with dimensionality reduction and clustering
- Worked out an algorithm—ccMCA—for contrastive component multiple correspondence analysis on the categorical data
- Developed a system to facilitate users to explore, identify and interpret the underlying pattern of the dataset

### Organizing and Visualizing Knowledge in Documents based on Domain Ontology<sup>[4]</sup>

*Research Work at University of California, Davis* Spacy, NLTK, DBPedia, Python, D3, Flask

- Introduced a text visualization technique to aid visual analysis of documents by referencing a domain ontology
- Developed a proof-of-concept system to visualize the hierarchical structure of the knowledge and support exploration
- Conducted a comparative user study with DocuBurst to explore the application scenario of both tools

**Automatic Generation of Infographics from Proportion-Related Natural Language Statement<sup>[7]</sup>** May 2018 - Aug. 2018

*Research Work at Microsoft Research Asia* C#

- Conducted an empirical study about the design space of infographics
- Built a proof-of-concept system that automatically converts statements about simple proportion related statistics to a set of infographics with pre-designed styles
- Participated in the Microsoft Garage hackathon to demonstrate the usability and usefulness of the system

**Unbiased Photon Gathering in Participating Media**

Apr. 2017 - Mar. 2018

*Research Work at Zhejiang University* C/C++

- Worked out an algorithm to extend the Siggraph paper *Unbiased Photon Gathering for Light Transport Simulation* to scenes with participating media and used the Woodcock Tracking method to achieve the unbiased sampling in volume
- Implemented the algorithm and integrated it into the rendering platform Mitsuba as a plugin

**Game Character Face Creation**

Jan. 2017 - Mar. 2017

*Internship at NetEase Games Corp.* Unity3D, Maya, XML

- Worked out a sound solution for customized character face creation in MMORPG games based on skeleton-driven animation
- Developed a stable tool to implement the skeleton-driven face creation method with Unity3D. This tool was already put into usage for character designers and integrated into the self-developed game engine of the company

**Liver Segmentation Based on CT Images<sup>[8]</sup>**

July 2015 - Sep. 2016

*Research Work at University of Alberta* C/C++, OpenGL

- Designed a probabilistic model for liver segmentation with abdominal CT images
- Developed a plugin for 3DMed to allow the interactive application of this algorithm

**Micro-blog Breaking Events Detection and Visualization<sup>[9][10][11]</sup>**

Apr. 2014 - Dec. 2014

*Competition Project* Java, Objective C

- Led a 4-people team to complete an 8-month research project about breaking event detection and tracking on Micro-blog
- Won the second prize of the National College Student Artificial Intelligence Design Contest 2014
- Developed the social network analysis pipeline and the visualization applications on both Window and IOS platform

**Procedural Texture Synthesis**

Mar. 2015 - June 2016

*Graduation Project of Bachelor's Degree* C/C++, OpenCV

- Implemented the texture synthesis algorithm in Siggraph Aisa paper *Local Random-Phase Noise for Procedural Texturing*
- Developed a toolkit to integrate the algorithm and interactively produce big texture according to the small sample provided by the user

**Supporting Structure for 3D Printed Objects**

July 2014 - Sep. 2014

*Internship at Hong Kong University* C/C++, OpenGL

- Implemented the algorithm proposed by the Siggraph paper *Bridging the Gap: Automated Steady Scaffoldings for 3D Printing*
- Conducted some practical printing experiments and optimized the algorithm