Forrest (Zifeng) Huang

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Education

2022 (Expected) **University of California, Berkeley** – Berkeley, CA
Ph.D. in Computer Science
Advisor: Professor John F. Canny. *GPA: 4.00/4.00.*
Committee Members: Professors Alexei A. Efros, Kosa Goucher-Lambert, Björn Hartmann.

2019 **University of California, Berkeley** – Berkeley, CA
M.S. in Computer Science
Advisor: Professor John F. Canny. *GPA: 4.00/4.00.*

2017 **University of Illinois at Urbana-Champaign** – Champaign, IL
B.S. in Computer Science with Highest Honors
Bachelor Thesis Advisor: Professor Ranjitha Kumar.
GPA: 3.97/4.00, Bronze Tablet Scholar: Top 3% of graduating class in College of Engineering.

Publications

Conference Proceedings

2021 **Multi-modal Search for Inspirational Examples in Design**
Elisa Kwon, **Forrest Huang**, and Kosa Goucher-Lambert.
In *Proceedings of the International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC '21).*

2021 **UMLAUT: Debugging Deep Learning Programs using Program Structure and Model Behavior**
Eldon Schoop, **Forrest Huang**, and Björn Hartmann. In *Proceedings of the 2021 ACM CHI Conference on Human Factors in Computing Systems (CHI '21).*

2020 **Scones: Towards Conversational Authoring of Sketches**
Forrest Huang, Eldon Schoop, David Ha, and John F. Canny. In *Proceedings (Long Paper) of the 25th ACM International Conference on Intelligent User Interfaces (IUI '20).*

2019 **Sketchforme: Composing Sketched Scenes from Text Descriptions for Interactive Applications**
Forrest Huang and John F. Canny. In *Proceedings of the 32nd ACM Symposium on User Interface Software and Technology (UIST '19).*

2019 **Swire: Sketch-based User Interface Retrieval**
Forrest Huang, John F. Canny, and Jeffrey Nichols. In *Proceedings of the 2019 ACM CHI Conference on Human Factors in Computing Systems (CHI '19).*

2018 **MakerLens: What Sign-In, Reservation and Training Data Can (and Cannot) Tell You About Your Makerspace**
Eldon Schoop, **Forrest Huang**, Nathan Khuu, and Björn Hartmann. In *Proceedings of the 2018 International Symposium on Academic Makerspaces (ISAM '18).*

2017 **ZIPT: Zero-Integration Performance Testing of Mobile App Design**
Biplab Deka, **Zifeng Huang**, Chad Franzen, Jeffrey Nichols, Yang Li, and Ranjitha Kumar. In *Proceedings of the 30th ACM Symposium on User Interface Software and Technology (UIST '17).*

2017 **Rico: A Mobile App Dataset for Building Data-Driven Design Applications**
Biplab Deka, **Zifeng Huang**, Chad Franzen, Joshua Hibschman, Daniel Afergan, Yang Li, Jeffrey Nichols, and Ranjitha Kumar. In *Proceedings of the 30th ACM Symposium on User Interface Software and Technology (UIST '17).*

2016 **ERICA: Interaction Mining Mobile Apps**
Biplab Deka, **Zifeng Huang**, and Ranjitha Kumar. In *Proceedings of the 29th ACM Symposium on User Interface Software and Technology (UIST '16).*

Preprints and Under Review

2022 **Generating Mobile User Interfaces from Text Descriptions with Transformers**
Forrest Huang, Gang Li, Xin Zhou, John F. Canny, David Ha, and Yang Li. *Under Review.*

2021 **Creating User Interface Mock-ups from High-Level Text Descriptions with Deep-Learning Models**
Forrest Huang, Gang Li, Xin Zhou, John F. Canny, and Yang Li. *arXiv 2110.07775, Link.*

Book Chapters

2021 **Sketch-based Creativity Support Tools using Deep Learning**
Forrest Huang, Eldon Schoop, David Ha, Jeffrey Nichols, and John Canny. In *Artificial Intelligence for Human Computer Interaction: A Modern Approach, Springer 2021.*

2021 **An Early Rico Retrospective: Three Years of Uses for a Mobile App Dataset**
Biplab Deka, Bardia Doosti, **Forrest Huang**, Chad Franzen, Joshua Hibschman, Daniel Afergan, Yang Li, Ranjitha Kumar, Tao Dong, and Jeffrey Nichols. In *Artificial Intelligence for Human Computer Interaction: A Modern Approach, Springer 2021.*

Journal Articles

2019 **GPU Accelerated t-Distributed Stochastic Neighbor Embedding**
David M. Chan*, Roshan Rao*, **Forrest Huang***, and John F. Canny. *(*equal contribution) Journal of Parallel and Distributed Computing (JPDC).*

Workshop Publications and Posters

2020 **SCRAM: Simple Checks for Realtime Analysis of Model Training for Non-Expert ML Programmers**
Eldon Schoop, **Forrest Huang**, and Björn Hartmann.
Late-Breaking Works of CHI '20 and *ICML 2020 Workshop on Human in the Loop Learning.*

2018 **t-SNE-CUDA: GPU-Accelerated t-SNE and its Applications to Modern Data**
David M. Chan*, Roshan Rao*, **Forrest Huang***, and John F. Canny.
In *Proceedings of the 2018 High Performance Machine Learning Workshop (HPML '18),* ***Outstanding Paper Award.***

2015 **Ranking Designs and Users in Online Social Networks**
Biplab Deka, Haizi Yu, Devin Ho, **Zifeng Huang**, Jerry O. Talton, and Ranjitha Kumar.
In *Proceedings of the 33rd ACM Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '15).*

Theses

2020 **Deep-learning-based Machine Understanding of Sketches: Recognizing and Generating Sketches with Deep Neural Networks**
Advisor: Professor John F. Canny.
Master's Thesis, UC Berkeley Technical Report No. UCB/EECS-2020-13.

2017 **Efficient Capturing of User-Interface Data on Android Apps**
Advisor: Professor Ranjitha Kumar. *Bachelor's Thesis, University of Illinois.*

Honors and Scholarships

2020 Adobe Research Fellowship Honorable Mention

2019–20 Google Cloud Platform Research Credits
granted for sketch generation research with David Ha, Research Scientist at Google Brain.

2018 Outstanding Paper Award, 2018 High Performance Machine Learning Workshop

2017 C.W. Gear Outstanding Undergraduate Researcher Award

2016–17 Maxine and Yunni Pao Memorial Scholarship

Research Experience

2017–22 **Graduate Student Researcher, Canny Lab, UC Berkeley** – Berkeley, CA
Developed multiple novel deep-learning systems that support creative activities with sketching and natural language. These systems explore multi-modal, conversational, and human-in-the-loop applications in a wide range of domains such as drawing, user interface design, and engineering design.

2021–22 **Research Intern and Student Researcher, Google** – Mountain View, CA
Mentors: Yang Li, Gang Li.
Developed the first deep-learning system that can generate and retrieve mobile user interface layouts from natural language descriptions. Submitted an academic publication and filed two patent applications from this body of research.

2018 **Software Engineering Intern and Student Researcher, Google** – Mountain View, CA
Mentor: Jeffrey Nichols.
Contributed the first large-scale dataset of paired user interface sketches and screenshots. Developed Swire, the first deep-learning system that directly retrieves relevant UI screenshots from sketches using this dataset. Published this dataset and system at CHI '19.

2015–17 **Research Assistant, Data-Driven Design Group, University of Illinois**
– Champaign, IL
Co-developed Rico, the largest publicly available dataset of mobile user interfaces that has supported a vast array of deep-learning research work including UI automation, UI generation, and design assistance.

Teaching Experience

2019–20 **Graduate Student Instructor, CS182/282A: Designing, Visualizing and Understanding Deep Neural Networks (UC Berkeley)**
Gave guest lectures on deep generative models. Led discussion sections and designed associated course materials. Mentored student-led projects investigating deep-learning architectures and/or tasks.

2019 **Graduate Student Instructor, CS160: User Interface Design and Development (UC Berkeley)**
Led discussion sections and provided feedback to student-developed UI prototypes.

2017 **Grader, CS446: Machine Learning (University of Illinois)**

2014–15 **Course Assistant, CS125: Introduction to Computer Science (University of Illinois)**

Other Industry Experience

2015 **Software Engineering Intern, The Climate Corporation** – San Francisco, CA
Developed an Android mobile application with a dashboard displaying weather events.

Mentorship and Service

2022 **Program Committee Member of 2022 CHI Workshop on Computational Approaches for Understanding, Generating, and Adapting User Interfaces**

2020 **Master's Thesis Mentor for Luming Chen (UC Berkeley)**
Mentored Luming's Master's thesis on TranSketch, a new dataset of natural language descriptions of modifications required to change one sketch to another. Published as *UC Berkeley Technical Report No. UCB/EECS-2020-92.*

2017–21 **Reviewer for CHI, UIST, MobileHCI, IMWUT, TWEB, IEEE TIP**

2015 **President, Promoting Undergraduate Research in Engineering Committee (University of Illinois)**

Technical Skills

Programming Languages/Libraries
Proficient in: Python, Tensorflow, jax, trax,
Familiar with: PyTorch, Flask, HTML/CSS, Javascript, Java, Android Development