

# Michael Xieyang Liu

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## RESEARCH FOCUS

My research is at the intersection of Human-computer Interaction (HCI), programming tools, sensemaking, end-user programming, and intelligent user interfaces, where I design and build systems that accelerate online sensemaking for developers and facilitate human-AI interactions for end-users.

## EDUCATION

- Ph.D. in Human-Computer Interaction** (*in progress*) 2017 - present  
Carnegie Mellon University, Pittsburgh, PA, USA  
**Thesis:** Scaffolding Knowledge Capturing, Structuring, and Reuse during Online Sensemaking  
**Advisors:** Brad A. Myers, Aniket Kittur  
**Committee:** Kenneth Holstein (CMU HCII), Daniel M. Russell (Google, Inc.)
- M.S. in Human-Computer Interaction** 2017 - 2021  
Carnegie Mellon University, Pittsburgh, PA, USA
- B.S. in Computer Science** 2013 - 2017  
University of Michigan, Ann Arbor, MI, USA
- B.S.E. in Electrical and Computer Engineering** 2013 - 2017  
University of Michigan–Shanghai Jiao Tong University Joint Institute, Shanghai, China

## PUBLICATIONS

### Peer-reviewed Conference Papers

- C.10 **Michael Xieyang Liu**, Advait Sarkar, Carina Negreanu, Ben Zorn, Jack Williams, Neil Toronto, Andrew D. Gordon. **"What It Wants Me To Say": Bridging the Abstraction Gap Between End-User Programmers and Code-Generating Large Language Models** [Under Review] at *ACM Conference on Human Factors in Computing Systems (CHI 2023)*.
- C.9 **Michael Xieyang Liu**, Andrew Kuznetsov, Yongsung Kim, Joseph Chee Chang, Aniket Kittur, Brad A. Myers. **Wigglite: Low-cost Information Collection and Triage**. *Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology (UIST 2022)*.
- C.8 Franklin Mingzhe Li, **Michael Xieyang Liu**, Yang Zhang, Patrick Carrington. **Freedom to Choose: Understanding Input Modality Preferences of People with Upper-body Motor Impairments for Activities of Daily Living**. *Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2022)*.

- C.7 **Michael Xieyang Liu**, Aniket Kittur, Brad A. Myers. **Crystalline: Lowering the Cost for Developers to Collect and Organize Information for Decision Making**. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2022)*.
- C.6 Amber Horvath, **Michael Xieyang Liu**, River Hendriksen, Connor Shannon, Emma Paterson, Kazi Jawad, Andrew Macvean, Brad A. Myers. **Understanding How Programmers Can Use Annotations on Documentation**. *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2022)*.
- C.5 **Michael Xieyang Liu**, Aniket Kittur, Brad A. Myers. **To Reuse or Not To Reuse? A Framework and System for Evaluating Summarized Knowledge**. *Proceedings of the ACM on Human-Computer Interaction*, 5, CSCW1, Article 166 (April 2021) (CSCW 2021).  
 **Best Paper Award** and CMU SCS News Coverage
- C.4 Joseph Chee Chang, Yongsung Kim, Victor Miller, **Michael Xieyang Liu**, Brad A. Myers, Aniket Kittur. **Tabs.do: Task-Centric Browser Tab Management**. *Proceedings of the 34th Annual ACM Symposium on User Interface Software and Technology (UIST 2021)*.
- C.3 **Michael Xieyang Liu**, Jane Hsieh, Nathan Hahn, Angelina Zhou, Emily Deng, Shaun Burley, Cynthia Taylor, Aniket Kittur, Brad A. Myers. **Unakite: Scaffolding Developers' Decision-Making Using the Web**. *Proceedings of the 32nd Annual ACM Symposium on User Interface Software and Technology (UIST 2019)*.  
 **Best Paper Honorable Mention Award**
- C.2 Jean Y. Song, Stephan J. Lemmer, **Michael Xieyang Liu**, Shiyan Yan, Juho Kim, Jason J. Corso, Walter S. Lasecki. **Popup: Reconstructing 3D Video Using Particle Filtering to Aggregate Crowd Responses**. *Proceedings of the 24th Annual ACM International Conference on Intelligent UserInterfaces (IUI 2019)*.
- C.1 Yu-Wei Chao, Yunfan Liu, **Xieyang Liu**, Huayi Zeng, Jia Deng. **Learning to Detect Human-Object Interactions**. *2018 IEEE Winter Conference on Applications of Computer Vision (WACV 2018)*.

## Workshop Papers & Posters

- W.3 Jane Hsieh, **Michael Xieyang Liu**, Brad A. Myers, Aniket Kittur. **An Exploratory Study of Web Foraging to Understand and Support Programming Decisions**. *IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*.
- W.2 **Michael Xieyang Liu**, Nathan Hahn, Angelina Zhou, Shaun Burley, Emily Deng, Aniket Kittur, Brad A. Myers. **UNAKITE: Support Developers for Capturing and Persisting Design Rationales When Solving Problems Using Web Resources**. *DTSHPS'18 Workshop on Designing Technologies to Support Human Problem Solving, IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2018)*.
- W.1 **Michael Xieyang Liu**, Shaun Burley, Emily Deng, Angelina Zhou, Aniket Kittur, Brad A. Myers. **Supporting Knowledge Acceleration for Programming from a Sensemaking Perspective**. *Sensemaking Workshop @ CHI Conference on Human Factors in Computing Systems (CHI 2018)*.

## Patent

- PT.2 Ben Zorn, Carina Negreanu, Advait Sarkar, Andrew Gordon, Jack Williams, **Michael Xieyang Liu**, Neil Toronto, Sruti Srinivasa Ragavan. **Generation of Interactive Utterances of Code Tasks**. *US Patent (submitted), 2022*
- PT.1 Aniket Kittur, Brad A. Myers, **Michael Xieyang Liu**. **Multidirectional Gesturing for OnDisplay Item Identification and/or Further Action Control**. *US Patent PCT/US2022/043604 (submitted), 2022*

## PROFESSIONAL EXPERIENCE

- Microsoft Research**, Research Intern May - Aug. 2022  
*with Advait Sarkar, Carina Negreanu, Jack Williams, Andy Gordon, Ben Zorn*  
Designed, built, and evaluated natural language interactions for end-user programmers.
- Google**, Research Intern May - Aug. 2020  
*with Dustin Smith, Todd Kulesza, and Sarah D'Angelo*  
Conducted qualitative research on Go developers' refactoring practices and engagement with refactoring tools.
- Bosch Research**, Research Intern May - Aug. 2019  
*with Lisa Yu, Wan-Yi Lin, and Alessandro Oltramari*  
Worked on crowd & AI-powered projects that aim to improve the safety and performance of autonomous vehicles.

## RESEARCH EXPERIENCE

- Graduate Research Assistant** (advised by Brad A. Myers & Aniket Kittur) 2017 - present  
*Human-Computer Interaction Institute, Carnegie Mellon University*  
Working on prototype systems that scaffold developers in making decisions using information from various web sources and enable subsequent developers to learn, understand, and reuse those decisions and rationales.
- Research Assistant** (with Jodi Forlizzi, Roni Rosenfeld & Ryan Tibshirani) 2020 - 2021  
*Delphi Research Group, Carnegie Mellon University*  
Working on the visualization team of the **COVIDcast system**, which displays indicators related to COVID-19 activity level across the U.S. These indicators are derived from a variety of anonymized, aggregated data sources made available by multiple partners, including Facebook, Google, and Quidel. [\[Press coverage\]](#)
- Undergraduate Researcher** 2016 - 2017  
*Crowds and Machines Lab, University of Michigan, Ann Arbor*  
Worked on crowd & AI-powered interdisciplinary projects that address novel and promising research questions.
- Research Assistant** (advised by Jia Deng) 2015 - 2016  
*Vision & Learning Lab, University of Michigan, Ann Arbor*  
Worked on a computer vision based toolkit that boosts performance on human-object interaction detection by exploiting human-object spatial relations.

## SELECTED HONORS, GRANTS, AWARDS & COVERAGE

- Special Recognitions for Outstanding Reviews**, ACM CHI Conference on Human Factors in Computing Systems (CHI 2023) Nov. 2022
- CMU SCS News Coverage on our CSCW 2021 Best Paper**: "CMU Researchers Develop Tool To Help Determine When To Reuse Content" Nov. 2021
- Best Paper Award**, 24th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2021) Oct. 2021
- Special Recognitions for Outstanding Reviews**, 34th Annual ACM Symposium on User Interface Software and Technology (UIST 2021) June 2021
- CMU News Coverage on COVIDcast**: "Carnegie Mellon Unveils Five Interactive COVID-19 Maps" April 2020
- Best Paper Honorable Mention Award**, 32nd Annual ACM Symposium on User Interface Software and Technology (UIST 2019) Oct. 2019

<b>SHF: Small: Knowledge Acceleration for Programming (\$500,000 over 3 years)</b> , NSF	June 2018
<b>James B. Angell Scholar</b> , 94th Annual Honors Convocation, University of Michigan	March 2017
<b>EECS Scholar Award</b> , 2017 EECS Honors & Awards Reception, University of Michigan	March 2017
<b>Summer Undergraduate Research Experience (SURE) program</b> , University of Michigan	May 2016
<b>Tang-Junyuan Fellowship (Top 2/250, \$50,000)</b> , UM-SJTU Joint Institute	July 2015, July 2016
<b>Dean's List</b> , University of Michigan	Dec. 2015, April 2016
<b>Basic Teaching Assistant Certificate</b> , Center for Learning and Teaching, UM-SJTU Joint Institute	Aug. 2015
<b>Dean's List</b> , UM-SJTU Joint Institute	Dec. 2013, Aug. 2014, Dec. 2014, Aug. 2015
<b>Fellowship for Outstanding Academic Performance</b> , Shanghai Jiao Tong University	June 2015
<b>Meritorious Winner (Acceptance: 9%)</b> , COMAP Mathematical Contest in Modeling	April 2015

## MENTORING

<b>Jane Hsieh</b> <i>Oberlin College Student (Currently a CMU S3D PhD. Candidate)</i> Studied programmers' web-foraging behaviors. Contributed to the development of the Unakite system.	2018 - 2019
<b>Emily Deng</b> <i>CMU Master's Student</i> Designed and carried out interview studies with programmers that probe their programming behaviors and needs.	2017 - 2018
<b>Shaun Burley</b> <i>CMU Master's Student</i> Designed and carried out interview studies with programmers that probe their programming behaviors and needs.	2017 - 2018

## TEACHING EXPERIENCE

<b>Teaching Assistant – 05-410/05-610 User-Centered Research &amp; Evaluation</b> Human-Computer Interaction Institute, Carnegie Mellon University	Fall 2020
<b>Teaching Assistant – 05-431/05-631 Software Structures for User Interfaces</b> Human-Computer Interaction Institute, Carnegie Mellon University	Fall 2020
<b>Teaching Assistant – 05-430/05-630 Programming Usable Interfaces</b> Human-Computer Interaction Institute, Carnegie Mellon University	Fall 2019
<b>Instructional Aide – EECS484 Database Management Systems</b> University of Michigan, Ann Arbor	Winter 2017
<b>Instructional Aide – EECS484 Database Management Systems</b> University of Michigan, Ann Arbor	Fall 2016
<b>Teaching Assistant – Vv255 Multivariate Calculus</b> University of Michigan – Shanghai Jiao Tong University Joint Institute	Summer 2015

## SERVICE

Academic Service

**Associate Chair** ACM CHI 2020 Late Breaking Work Track  
**Conferences:** CHI (2019, 2020, 2021, 2022, 2023), CSCW (2019, 2020, 2021, 2022), UIST (2019, 2020, 2021, 2022), IUI (2020), VAST (2020)  
**Paper Reviewing** **Journal:** TOCHI (2022)  
🏆 *Special Recognitions for Outstanding Reviews: UIST (2021), CHI (2023)*

## Departmental & Community Service

**Committee Member** REU (Research Experience for Undergraduate) Admissions Committee (2021-2022)  
**Committee Member** CMU HCII Faculty Lunch Organization Committee (2019-2020)  
**Committee Member** CMU HCII Ph.D. Student Lounge Committee (2019-2020)

## LANGUAGES, TECHNICAL SKILLS & COURSES

**Languages** English, Chinese (Mandarin) - Native or bilingual proficiency,  
German - Limited working proficiency  
**Programming** HTML/Javascript/CSS, Python, SQL, C/C++, Swift, Java, LaTeX, etc.  
**Web & App Development** React.js, Angular, Redux, Bootstrap, Node.js, PHP, Ionic Framework, etc.  
**Deep Learning & AI** PyTorch, Tensorflow, ml5.js  
**Courses** Machine Learning, Deep Learning, Advanced User Interfaces, Database Management Systems, Information Security, Web Development

## REFERENCES

**Brad A. Myers** (*doctoral advisor*)  
Professor & HCII Interim Director  
Human Computer Interaction Institute, School of Computer Science, Carnegie Mellon University  
bam@cs.cmu.edu

**Aniket (Niki) Kittur** (*doctoral advisor*)  
Professor  
Human Computer Interaction Institute, School of Computer Science, Carnegie Mellon University  
nkittur@cs.cmu.edu

**Ben Zorn**  
Partner Researcher & Former Co-manager of the Research in Software Engineering (RiSE)  
Microsoft Research, Redmond, US  
ben.zorn@microsoft.com

**Advait Sarkar**  
Senior Researcher  
Microsoft Research, Cambridge, UK  
advait@microsoft.com

**Andy Gordon**  
Senior Principal Research Manager  
Microsoft Research, Cambridge, UK  
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**Carina Negreanu**  
Senior Researcher  
Microsoft Research, Cambridge, UK  
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