Yan Chen

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Contact Information

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Short Bio.

Yan Chen is a Postdoctoral Fellow in the Department of Computer Science at the University of Toronto, where he is hosted by Professor Tovi Grossman. He received his Ph.D. from the University of Michigan School of Information in 2020, where he was advised by Steve Oney. Prior to Ph.D., Yan received both his M.S. and B.S. from the University of Colorado at Boulder, where he completed his master thesis with Professor Harvey Segur in the Applied Mathematics Department and worked as an undergraduate research assistant with Professor Tom Yeh in the Computer Science Department. Yan also worked as an undergraduate research assistant with Professor Katharina Reinecke and Professor Krzysztof Gajos at Harvard University.

Research Interests

My research in HCI studies challenges that computer programmers at all levels of expertise face when using existing tools and methods to seek support. It combines human and machine computation to create programming support systems that can effectively and scalably assist programmers when needed. The systems I create address challenges including providing within-IDE help in nearly real time, providing feedback to learners at scale, synthesizing code snippets reliably, and testing an interface with high coverage, which neither computers nor humans can effectively solve alone. To make these systems possible, my research explores how to design workflows and interfaces that can effectively coordinate and scale the collective effort of experts, non-experts, and machines.

Keywords: Programminig collaboration, developer support tools, end-user programming, CS education tools, crowdsourcing.

Education

University of Michigan, Ann Arbor, MI, US

Ph.D. in Information Science (2014 - 2020)

- Dissertation: On-demand Collaboration in Programming
- Advisor: Steve Oney
- Committee: Mark Ackerman, Mark Guzdial, Philip Guo

University of Colorado, Boulder, CO, US

M.S in Applied Mathematics (2014)

- Master Thesis: Asymptotic Series Solutions To One-Dimensional Helmholtz Equation
- Thesis Advisor: Harvey Segur

B.S. in Applied Mathematics and B.S. in Electrical and Computer Engineering (2014)

Professional Experience

University of Toronto, Toronto, Canada

- Postdoctoral Fellow, (Jan. 2021 - present)
- Host: Prof. Tovi Grossman

Google, Mountain View, CA, US

- UX Research Intern, (May. 2019 - Aug. 2019)
- Host: Dr. Tao Dong
  Supporting programming learning via live streaming [8]

Snap Inc., Seattle, WA, US

- Research Intern, (Jan. 2018 - Apr. 2018)
- Hosts: Dr. Andrés Monroy-Hernández and Dr. Rajan Vaish
  Interviewed with staffed Snap Story curators on their curation tools experience. Drew design implications. Developed a hybrid-machine workflow and system for rapid video curation. Conducted a large-scale (30k+ video) study to explore the effectiveness of the approach [4].

Harvard University, Cambridge, MA, US

- Undergraduate Research Intern, (Jun. 2013 - Aug. 2013)
- Advisors: Professor Katharina Reinecke, Professor Krzysztof Gajos
  Developed a web application that quantifies websites' aesthetics and predicts visual preference of people with different cultural background.

University of Colorado, Boulder, CO, US

- Research Assistant, (Sep. 2012 - May 2014)
- Advisor: Professor Tom Yeh
  Developed and conducted in-lab experiments for the active authentication project on personal computer and smart phone. Applied image and video processing techniques for pattern recognition [1].

University of Colorado, Boulder, CO, US

- Research Assistant, (Sep. 2012 - May 2014)
- Advisor: Professor Harvey Segur
  Generalized hyperasymptotic series mechanism to approximate other functions. Discovered unavoidable oscillation in hyperasymptotic series mechanism.

Conference Papers and Journals

Approx. Acceptance Rates: CHI: 23%, UIST: 22%, CSCW: 25%, VL/HCC: 30%, PLDI: 20%, IMX: 26%

15. Kevin Pu, Rainey Fu, Rui Dong, Xinyu Wang, **Yan Chen**, Tovi Grossman. SemanticOn: Specifying Content-Based Semantic Conditions for Web Automation Programs.*ACM Symposium on User Interface Software and Technology (UIST), 2022.* (conditionally accepted)

14. Karthik Mahadevan, **Yan Chen**, Maya Cakmak, Anthony Tang, Tovi Grossman. Mimic: In-Situ Recording and Re-Use of Demonstrations to Support Robot Teleoperation. *ACM Symposium on User Interface Software and Technology (UIST), 2022.* (conditionally accepted)

13. Rui Dong, Zhicheng Huang, Ian Iong Lam, **Yan Chen**, Xinyu Wang. WebRobot: Web Robotic Process Automation using Interactive Programming-by-Demonstration. In *Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2022).*

12. Jiannan Li, Mauricio Sousa, Chu Li, Jessie Liu, **Yan Chen**, Ravin Balakrishnan, Tovi Grossman. ASTEROIDS: Exploring Swarms of Mini-Telepresence Robots for Physical Skill Demonstration.In *Proceedings of the International ACM Conference on Human Factors in Computing Systems (CHI 2022).*

11. **Yan Chen**, Tovi Grossman. Umitation: Retargeting UI Behavior Examples for Website Design. *ACM Symposium on User Interface Software and Technology (UIST), 2021.*

10. April Yi Wang*, **Yan Chen***, John Joon Young Chung, Christopher Brooks, and Steve Oney. PuzzleMe: Leveraging Peer Assessment for In-Class Programming Exercises. In *Proceedings of the International ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2021).*

9. **Yan Chen**, Sang Won Lee, and Steve Oney. CoCapture: Effectively Communicating UI Behaviors on Existing Websites by Demonstrating and Remixing. In *Proceedings of the International ACM Conference on Human Factors in Computing Systems (CHI 2021)*, Virtual, USA.

8. **Yan Chen**, Walter S. Lasecki, and Tao Dong. Towards Supporting Programming Education at Scale via Live Streaming. In *Proceedings of the International ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2020).*

7. **Yan Chen**, Jaylin Herskovitz, Walter S. Lasecki, and Steve Oney. A Hybrid Crowd-Machine Workflow for Program Synthesis. IEEE Symposium on Visual Languages and Human-Centric Computing *VL/HCC '20.*

6. **Yan Chen**, Jaylin Herskovitz, Gabriel Matute, April Wang, Sang Won Lee, Walter S. Lasecki, and Steve Oney. EdCode: Towards Personalized Support at Scale for Remote Assistance in CS Education. IEEE Symposium on Visual Languages and Human-Centric Computing *VL/HCC '20* (**Best Short Paper**).

5. **Yan Chen**, Maulishree Pandey, Jean Y. Song, Walter S. Lasecki, and Steve Oney. Improving Crowd-Supported GUI Testing with Structural Guidance. In *Proceedings of the International ACM Conference on Human Factors in Computing Systems (CHI 2020)*, Hawaii, USA.

4. **Yan Chen**, Andres Monroy-Hernandez, Ian Wehrman, Steve Oney, Walter S. Lasecki, Rajan Vaish. Sifter: A Hybrid Workflow for Theme-based Video Curation at Scale. In *Proceedings of the International ACM Conference on Interactive Media Experiences (IMX 2020)*, Barcelona, Spain.

3. **Yan Chen**, Sang Won Lee, Yin Xie, Yiwei Yang, Walter S. Lasecki, Steve Oney. Codeon: On-Demand Software Development Assistance. In *Proceedings of the International ACM Conference on Human Factors in Computing Systems (CHI 2017)*, Denver, USA.

2. **Yan Chen**, Steve Oney, Walter S. Lasecki. Towards Providing On-Demand Expert Support for Software Developers. In *Proceedings of the International ACM Conference on Human Factors in Computing Systems (CHI 2016)*, San Jose, USA.

1. Vishal Patel, Tom Yeh, M Salem, Yangmuzi Zhang, **Yan Chen**, Rama Chellappa, Larry Davis. Screen Fingerprints: a Novel Modality for Active Authentication. *IT Professional* 15, no. 4 (2013):38-42.

Other Publications

9. **Yan Chen**, Yaxing Yao, Jasmine Jones. WireOn: Supporting Remote Collaboration for Embedded System Development. Demo at *The International ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2020).*

8. **Yan Chen**, Jasmine Jones, Steve Oney. On-demand Programming Assistance. New Future of Work Symposium at Microsoft Research.

7. Yan Chen. Mocking-up Desired UI Behaviors from UI Element-Based Recording. Graduate Consortium at *IEEE Symposium on Visual Languages & Human-Centric Computing (VLHCC'19).*

6. **Yan Chen**, Steve Oney, and Walter S. Lasecki. Enhancing Context and Guidance for Asynchronous Collaboration. Poster at *Human Computer Interaction Consortium (HCIC'18).*

5. Sang Won Lee, **Yan Chen**, and Walter S. Lasecki. Speech-To-Tasks: Real-Time Crowd Generation of Task Lists from Speech. Demo at *The AAAI Conference on Human Computation (HCOMP '17).*

4. Sang Won Lee, **Yan Chen**, Noah Klugman, Sai R. Gouravajhala, Angela Chen, and Walter S. Lasecki. Exploring Coordination Models for Ad Hoc Programming Teams. Late-Breaking-Work

at *International ACM Conference on Human Factors in Computing Systems (CHI 2017)*, Denver, USA.

3. **Yan Chen**, Steve Oney, Walter S. Lasecki. Expert Crowd Support Systems for Software Developers. Collective Intelligence 2016, New York, USA. (Oral presentation)

2. **Yan Chen**, Steve Oney, Walter S. Lasecki. Automatically Capturing Context to Create Microtasks for Software Development. Workshop at *International ACM Conference on Human Factors in Computing Systems (CHI 2016)*, San Jose, USA.

1. Esther Vasiete, **Yan Chen**, Ian Char, Tom Yeh, Vishal Patel, Larry Davis, Rama Chellappa. Toward a non-intrusive, physio-behavioral biometric for smartphones. In *Proceedings of the 16th international conference on Human-computer interaction with mobile devices & services. (MobileHCI 2014)*, pp. 501-506. Toronto, Canada.

Teaching Experience

University of Michigan, Ann Arbor, MI, US

- Introduction to Programming (with Anthony Whyte), (Fall 2019)
- User Interface Development (with Walter Lasecki), (Winter 2019)
- User Interface Development (with Mark Guzdial), (Fall 2018)
- User Interface Development (with Mark Ackerman), (Fall 2017)
- Introduction to Programming (with Steve Oney and Paul Resnick), (Fall 2016)
- Data Visualization (with Eytan Adar), (Fall 2015)

Students (Co)Advised

Feel free to contact these students, espeically co-authors, for experience of working with me.

University of Toronto

- **Blaine Lewis** (2021-), ongoing PhD student at U of T.
  Working on understanding and mitigating the within-the-bar bias
- **Bryan Wang** (2021-), ongoing PhD student at U of T.
  Designing tools to contextually align chord suggestions for interactive music co-composition
- **Jiannan Li** (2021-), ongoing PhD student at U of T.
  Designing tools to support remote learning and collaboration on physical tasks
- **Karthik Mahadevan** (2021-), ongoing PhD student at U of T.
  Designing tools to help people create reusable robot behaviors in teleoperation interface
- **Majeed Kazemitabaar** (2021-), ongoing PhD student at U of T.
  Designing tools to help people transition from block-based to text-based programming
- **Carlos McGregor** (2021-), ongoing Master student at U of T.
  Examinating pupil dilation as a measure of cognitive load in CS1 students
- **Kevin Pu** (2021-), ongoing Master student at U of T.
  Designing tools to help users to specify logic reasoning for conditional web automation tasks
- **Stephen Brade** (2021-), ongoing Undergrad student at U of T.
  Designing tools to contextually align chord suggestions for interactive music co-composition
- **Rainey Fu** (2022-), ongoing Undergrad student at U of T.
  Designing tools to help users to specify logic reasoning for conditional web automation tasks
- **Jim Yang** (2022-), ongoing Undergrad student at U of T.
  Designing AI systems to learn UI automation with dynamic semantic conditions

- **Muhammad Ahsan Kaleem** (2022-), ongoing Undergrad student at U of T.
  Designing AI systems to learn UI automation with dynamic semantic conditions
- **Angel Yuan** (2022-), ongoing Undergrad student at U of T.
  Reusing Human-AI working memory for rapid UI prototyping.
- **Leshi Yang** (2022-), ongoing Undergrad student at U of T.
  Reusing Human-AI working memory for rapid UI prototyping.

University of Michigan

- **Muhan Zhao** (Summer 2020), now grad student at CMU.
- **Yunjie Guo** (Summer 2020), now SWE at Meituan.
- **Ruidong Liu** (Fall 2019), now PhD student at Cornell.
- **Jessica Wu** (Winter 2019), now SWE at Amazon.
- **Yiwei Yang** (2015 - 2016), now PhD student at U. Washington.
- **Gabriel Matute** (2016 - 2017), now PhD student at UC Berkely.
- **Jaylin Herskovitz** (2016 - 2017), now PhD student at UMich.
- **Yin Xie** (Summer 2016), now interaction designer at Internet Brands.

University of Colorado at Boulder

- **Ian Char** (Fall 2013 - Spring 2014), now PhD student at CMU.

Invited Talks

T5. *Hybrid Intelligence for Programming Support*

- Peking University, EECS (October 2021)
- Microsoft PROSE Research Team (September 2021)

T4. *On-demand Collaboration in Programming*

- University of Toronto (June 2020)

T3. *Support Programming Learning via Livestream*

- Google Flutter Team (August 2019)

T2. *Improving Crowd-Supported GUI Testing with Structural Guidance*

- Snapchat Research Team (April 2018)

T1. *CodeOn: On-demand Expert Support for Software Development*

- Tsinghua University (June 2015)

Service

S3. Paper reviewing

- PC: CHI'23, UIST'22, VLHCC'21
- Reviewer: CHI '16-'22, UIST '16-'21, CSCW '17-'20

S2. Led "POSSE Workshop: Introduction to Web Programming" (Workshop) @ POSSE Foundation, 2018, Ann Arbor, MI, United States

S1. Michigan Interactive and Social Computing Research Group (MISC) student coordinator ('19)

Honors & Grants & Awards

H6. University of Michigan Rackham Graduate School Research Grant ('19)

H5. Best short paper award, VL/HCC'20.

H4. Special Recognition Received for Excellent Review CHI'19.

H3. Selected as a HCIC-Funded Student in University of Michigan to participate in Human Computer Interaction Consortium(HCIC) 2018 "AI & HCI".

H2. University of Michigan Rackham Graduate School Student Travel Grant ('16, '17, '20)

H1. University of Michigan School of Information Student Travel Grant ('16, '17, '20)

PRESS

P3. Best practice guidance for live streaming programming, Google (2019)
(youtube: https://bit.ly/36W0Pkg)

P2. Best practices for hosting a live streaming coding session, Google (2019)
(medium: https://bit.ly/2SfEavb)

P1. Codeon is the intelligent assistant for software developers, UMich CSE News (2017)
(web article: https://bit.ly/3bMGd2l)