John Chen

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SUMMARY

As a human-computer interaction and learning researcher, I study how to leverage advanced technologies, such as Generative AI (GAI) or Augmented Reality, for informal learning at scale. I have led the research, design, and development of Physics Lab AR and Turtle Universe, App Store-featured software, reaching 7 million online, out-of-school learners worldwide. To understand the resulting large-scale human datasets, I have developed novel computational approaches with GAI to conduct and evaluate inductive qualitative coding. Over the past decade, I have learned from and worked with hundreds of learners across diverse ages and backgrounds.

EDUCATION

2019-2025(expected)	**Northwestern University**	Evanston, IL
	PhD in Computer Science and Learning Sciences	
	Dissertation title: Constructionist Learning Design for Agent-based Modeling and Programming: Increasing Access, Building Scaffolds, and Cultivating Communities	
	Dissertation Advisor: Uri J. Wilensky	
2012-2016	**Beijing Normal University**	
	Bachelor of Arts in Chinese Language and Literature	Beijing, CN

PEER-REVIEWED PUBLICATIONS

Chen, **J.**, Lu, X., Du, Y., Rejtig, M., Bagley, R., Horn, M. S., & Wilensky, U. J. (2024). Learning Programming of Agent-based Modeling with LLM Companions: Experiences of Novices and Experts Using ChatGPT & NetLogo Chat. *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems.*

Chen, **J.**, Zhao, L., Li, Y., Xie, Z., Wilensky, U. J., & Horn, M. S. (2024). "Oh My God! It's Recreating Our Room!" Understanding Children's Experiences with A Room-Scale Augmented Reality Authoring Toolkit. *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems.*

Chen, **J.**, Horn, M. S., & Wilensky, U. J. (2023a). Interactive Constructionist Scaffolds for Agent-Based Modeling and Programming in NetLogo. *FabLearn / Constructionism 2023: Full and Short Research Papers.*

Chen, **J.**, Horn, M. S., & Wilensky, U. J. (2023b). Tortuga: Building Interactive Scaffolds for Agent-based Modeling and Programming in NetLogo. *Proceedings of ISLS Annual Meeting 2023.*

Chen, **J.**, Zhao, L., Horn, M. S., & Wilensky, U. J. (2023). The Pocketworld Playground: Engaging online, out-of-school learners with Agent-based Programming. *Proceedings of the ACM Interaction Design and Children (IDC) 2023.*

Chen, **J.**, Zhao, L., Xiao, F., Horn, M. S., & Wilensky, U. J. (2022). Self-Governed Collaborative Inquiry in Action: A Case Study of a Large-Scale Online Youth Community. *Proceedings of ISLS Annual Meeting 2022.*

Manuscripts in Process

Chen, **J.**, Lotsos, A., Wang, G., Zhao, L., Wilensky, U. J., Hullman, J., Sherin, B., & Horn, M. S. (In Review). Generating and Evaluating Inductive Qualitative Coding Results through Human-AI Collaboration. *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems.*

Chen, **J.**, Lotsos, A., Zhao, L., Wang, G., Wilensky, U. J., Sherin, B., & Horn, M. S. (In Review). Navigating Pathways for Automated Inductive Coding With Generative AI/Topic Modeling: An Exploratory Study. *AERA Annual Meeting 2025.*

Chen, **J.**, Zhao, L., Horn, M. S., & Wilensky, U. J. (In Preparation). Physics Lab: Designing Online Collaborative Learning Environment With and For Youth. *Proceedings of the ACM Interaction Design and Children (IDC) 2025.*

Zhao, L., Li, Y., **Chen**, **J.**, & Horn, M. S. (In Review). Balancing Facilitation and Exploration: Analyzing Visitor Interactions with a Medical Patient Simulator in a Science Museum. *AERA Annual Meeting 2025.*

Wilkinson, J. T., Kelter, J., **Chen**, **J.**, & Wilensky, U. (2024). A Network Simulation of OTC Markets with Multiple Agents. *arXiv preprint arXiv:2405.02480.*

Papers and Posters Presented

Chen, **J.**, Horn, M. S., & Wilensky, U. J. (2023). NetLogo AR: Bringing Room-Scale Real-World Environments Into Computational Modeling for Children. *Proceedings of the ACM Interaction Design and Children (IDC) 2023.*

Chen, **J.**, & Wilensky, U. J. (2023a). ChatLogo: A Large Language Model-Driven Hybrid Natural-Programming Language Interface for Agent-Based Modeling and Programming. *Proceedings of FabLearn/Constructionism 2023.*

Chen, **J.**, & Wilensky, U. J. (2023b). Measuring Young Learners' Open-ended Agent-based Programming Practices with Learning Analytics. *Paper Presented at AERA Annual Meeting 2023.*

Li, Y., & **Chen**, **J.** (2023). Creative Expression through Color and Sound: A NetLogo Model for the Sonification of Color and the Visualization of Sound. *Proceedings of FabLearn/Constructionism 2023.*

Mongkhonvanit, K., Hummer, T. M., & **Chen**, **J.** (2023). Velo: Exploring Animal Behavior Modeling through Hybrid Robotics-Simulation Learning Experience. *Proceedings of the ACM Interaction Design and Children (IDC) 2023.*

Chen, **J.**, & Wilensky, U. J. (2021). NetLogo Mobile: Introduction to A New Incarnation of NetLogo with embedded tools for Designing Interactive Scaffolds. *Presented at ISLS Annual Meeting 2021.*

Chen, **J.**, & Wilensky, U. (2020). NetLogo Mobile: An Agent-Based Modeling Platform and Community for Learners, Teachers, and Researchers. *Proceedings of International Conference of the Learning Sciences 2020.*

MAJOR PROJECTS

Human-AI Collaboration in Inductive Qualitative Analysis (2024-)

Project Lead, Proposal Co-writer

– Led the project's technical and research team with 4 undergraduate and graduate students.
– Proposed and developed novel computational approaches to generate and evaluate inductive coding results (in submission: AERA 2025, CHI 2025).
– Co-writing an NSF CISE:Core (IIS HCC) grant proposal to co-design interfaces for human-AI collaborative qualitative analysis with Prof. Uri Wilensky & Michael Horn.

Cultivating Modeling Literacy and Practice through a NetLogo OSE (2023-) NSF

Core Team Member, Proposal Co-writer

– Co-wrote the successful grant proposal (NSF's Pathways to Enable Open-Source Ecosystems, $1,449,990) with Prof. Uri Wilensky and Michael Horn.
– Participated in a 4-week NSF training and interviewed global stakeholders in academia and industry.
– Designed and cultivated NetLogo's official online forum to encourage open-source contributions.

Enhancing Infrastructure for Model-Based Inquiry in Learning (2022-2024) NU-SESP

Project Lead, Proposal Co-writer

– Co-wrote the successful grant proposal (Northwestern University School of Education and Social Policy (SESP)'s Venture Research Fund, $49,600) with Prof. Uri Wilensky.
– Recruited and supervised the project's team with 6 undergraduate and graduate students to design and develop authoring features for NetLogo Web.

NetLogo Chat (ChatLogo, 2023-)

Project Lead, Proposal Co-writer

– Led the project's technical and research team with 5 undergraduate and graduate students to design the first Generative AI-based interface for (learning of) scientific modeling.
– Conducted a global interview study with 30 academics, professionals, and graduate students to understand their perceptions, behaviors, and needs (CHI 2024).
– Co-writing an NSF RITEL grant proposal to co-design a new iteration of NetLogo Chat for a high-school learning audience with Prof. Uri Wilensky.

NetLogo AR (2023-) Link to Project

Project Lead

– Led a technical and research team with 4 undergraduate and graduate students to design the first room-scale AR authoring system integrated with computational thinking ideas.
– Facilitated an 8-week after-school co-design activity with a diverse cohort of elementary school students.
– Conducted video analysis to reveal children's spatial thinking engagement and provided design suggestions (CHI 2024).

Turtle Universe (NetLogo Mobile, 2019-) Link to Product

Founder, Project Lead

– Led a technical and research team with 16 undergraduate and graduate students to design and research the mobile-first incarnation of NetLogo.
– Engaged 104,539 worldwide users (mostly online, informal learners, as of Aug 2024) in constructing and sharing programming and scientific modeling projects.
– Conducted design-based mixed methods research to understand the design of interactive scaffolds for informal, online learners (AERA 2022, IDC 2023, Constructionism 2023, ISLS 2023).

Physics Lab AR (2017-)

Founder, Project Lead
- Repeatedly featured by Apple's App Store in Canada, Cambodia, China Mainland, Indonesia, Macao, Malaysia, Philippines, Singapore, Thailand, and Vietnam.
- Engaged 6,995,217 worldwide users (mostly online, informal learners, as of Aug 2024) with constructing or sharing physics simulations.
- Conducted mixed methods research to understand its success and large-scale online community, examining millions of log data, shared artifacts, and conversations (ISLS 2022; IDC 2025, in preparation).

CIVITAS (2013-2017)

Founder, Project Lead
- Led the massive online social simulation's design and development.
- Engaged around 60,000 youth and young adults in China.

Professional Services

Grant Proposal Panelist
National Science Foundation (2023, 2024)

Conference Organizer

ACM Interaction Design and Children (2023)	Virtual Conference Co-chair

Reviewer / Program Committee Member

ACM Interaction Design and Children (2022-2024)	Reviewer
ISLS Annual Meeting (2021-2023)	Program Committee Member
ACM Computer-Supported Collaborative Work (2022-2025)	Reviewer (Special Recognition)
ACM Conference on Human Factor in Computing Systems (2022-2024)	Reviewer (Special Recognition)
AERA Annual Meeting (2021-2025)	Reviewer, Session Chair
Constructionism Conference (2023)	Program Committee Member

Awards and Activities

University Fellowship, Northwestern University	2019-2020
Dissertation Fellowship, Northwestern University	2024-2025
Participant, NSF CAMEL - Shaping the Future of Mathematics Learning and Education: A Scoping Workshop	2024

Teaching Experience

Teaching Assistant @ Northwestern University	Spring 2022
Teaching Assistant @ Northwestern University	Spring 2024

CS372/472/LS451: Designing & Constructing Models With Multi-Agent Languages
- Co-developed syllabus, curriculum, assignments, and course sequences with Prof. Uri Wilensky.
- Taught dozens of technical, feedback, and QA sections throughout the class.
- Served as a substitute instructor, holding lectures and project workshops with students.
- Graded and supervised students' weekly and final projects.
- Co-authored a paper with an undergraduate student.

Teaching Assistant @ Northwestern University   Winter 2023

LS426/CS496: The Design of Technological Tools for Thinking and Learning
– Co-developed syllabus, curriculum, assignments, and course sequences with Prof. Uri Wilensky.
– Taught technical, feedback, and QA sections throughout the class.
– Graded and supervised students' weekly and final projects
– Co-authored two presentations (IDC 2023) with three graduate students.

Guest Instructor   Winter 2023

Introduction to Agent-based Modeling for Ukrainian Children @ Art of Inquiry
– Worked with organizers and young volunteers to co-design the online sessions.
– Designed and adapted the learning experience for children in the war zone or as refugees.

Supervised Students and Interns

Charles Cheng	Undergrad @ Northwestern University - Curricular Designer (2020-2021)
Siqi Chen	Master Student @ Northwestern University - Designer (2020)
Sixuan Li	Master Student @ University of Washington - Designer (2020)
Shimei Qiu	Master Student @ Northwestern University - Designer (2020-2021)
Zixuan Gu	Master Student @ Northwestern University - Designer (2020)
Chelsea Guzman	Undergrad @ Northwestern University - Translator (2021-2022)
Cassandra Lagunas	Undergrad @ Northwestern University - Translator (2021)
Feiwen Xiao	Master Student @ University of Pennsylvania - Research Assistant (2021-2022)
Hanwen Zhang	Undergrad @ Middlebury College - Research Assistant (2021-2022)
David Du	Master Student @ Northwestern University - Designer (2023-2024)
Sherry Xu	Master Student @ Northwestern University - Designer (2024)
Seungyeon Kim	Master Student @ Northwestern University - Designer (2024)
Ruth Bagley	Master Student @ Northwestern University - Developer & RA (2023-2024)
Haylie Wu	Undergrad @ Northwestern University - Developer (2023)
Acero Liang Li	Undergrad @ SUNY Buffalo - Developer (2023-2024)
Ethan Ji	Undergrad @ University of Wisconsin Madison - Developer (2023-2024)
Eugenia Cao	Undergrad @ Northwestern University - Research Assistant (2023)
Andre Chen	Undergrad @ Northwestern University - Developer (2023-2024)

Software and Models

Chen, **J.**, & Wilensky, U. (2023a). *NetLogo AR: Combining NetLogo with Room-scale Augmented Reality.* https://github.com/NetLogo-Mobile/NetLogo-AR/

Chen, **J.**, & Wilensky, U. (2023b). *NetLogo Chat: An LLM-based Modeling Assistant of NetLogo.* https://github.com/NetLogo-Mobile/TU-Editor/

Chen, **J.**, & Wilensky, U. (2021a). *NetLogo Model: Limited Order Book.* https://ccl.northwestern.edu/netlogo/models/LimitedOrderBook

Chen, **J.**, & Wilensky, U. (2021b). *NetLogo Model: The Pocketworld Playground.* https://www.turtlesim.com/products/turtle-universe/

Chen, **J.**, & Wilensky, U. (2021c). *NetLogo Model: Virus in a Community.* https://www.turtlesim.com/products/turtle-universe/

Chen, **J.**, & Wilensky, U. (2021d). *Tortuga: Building Interactive Scaffolds for NetLogo.* https://github.com/NetLogo-Mobile/Tutorial-Editor/

Chen, **J.**, & Wilensky, U. (2021e). *Turtle Universe.* https://www.turtlesim.com/products/turtle-universe/

Chen, **J.**, & Zhao, L. (2017). *Physics Lab.* https://www.turtlesim.com/products/physics-lab/

Skills

Programming Languages	C++, C#, Coffeescript, CSS, HTML, Kotlin, Java, Javascript, NetLogo, Objective-C, Python, Ruby, Typescript, Shellscript, VB.net, Swift, SQL
Other Technical Skills	Full-Stack Development, Product Management, Online Community Design, Data Visualization, UI/UX, AR/VR (Headsets/Handhelds), Prompt Engineering, LLM-driven Systems
Quantitative Toolkits	STATA, R, Tableau, & many Python and Javascript packages
Quantitative Methodologies	Cluster Analysis, Regression Analysis, Network Analysis, Survival Analysis, Time Series Analysis
Qualitative Methodologies	Clinical Interview, (Quantitative/Online) Ethnography, Grounded Theory Analysis, Thematic Analysis, Video Analysis

Invited Talks and Presentations

Chen, J., Zhao, L., & Lostos, A. (2024). When LLMs meet the Grounded Theory: Generate and Evaluate Open-Ended Qualitative Codes through Human-AI Collaboration. *Presented at Human-Computer Interaction Consortium 2024.*

Professional Experience

Co-founder, Turtle Sim LLC Aug 2020 - present

– Co-founded with Professor Uri J. Wilensky for running the two popular learning software, Physics Lab AR and Turtle Universe.

Founder, CIVITAS LLC Aug 2014 - Sep 2019

– Founded the CIVITAS LLC, an award-winning and solution provider in educational technology, Augmented Reality (AR), and Virtual Reality (VR). Designed and implemented Dental Medicine, Criminology, and Physics projects for several Asian universities.

Professional Affiliations

Association for Computing Machinery (2023-)	Membership
ACM SIGCHI (2024-)	Membership
American Educational Research Association (2021-)	Membership
International Society of Learning Sciences (2021-)	Membership

References

Prof. Uri J. Wilensky, Northwestern University
Lorraine H. Morton Professor of Learning Sciences, Computer Science and Complex Systems
uri@northwestern.edu

Prof. Michael S. Horn, Northwestern University
Professor of Computer Science and Learning Sciences
michael-horn@northwestern.edu

Prof. Bruce L. Sherin, Northwestern University
Professor of Learning Sciences
bsherin@northwestern.edu