

Layne Jackson Hubbard

Curriculum Vitae

University of California Irvine
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Irvine, California
U.S.A.

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<https://laynes.world>
<https://mindscribe.org>
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Research Interest

I am an NSF-funded Computing Innovation Fellow at the University of California Irvine where I work on tools to support young children in creativity, reflection, and play. Through collaborative partnerships with early childhood media groups, I design inquisitive conversational agents for books, toys, and TV shows.

The goal of my research is to deepen everyday play, by engaging young children in reflecting on their creative play experiences through Q&A with a conversational agent. And through these interactions, **I am exploring ways that reflection might strengthen cognition, social-emotional skills, and trauma resilience** in the developing brain.

keywords: child-robot interaction, conversational agents, metacognitive reflection, creativity, early childhood development, trauma resilience

Education

08/2015 – **Triple Ph.D. in Computer Science, Cognitive Science, and Neuroscience**

08/2021 University of Colorado Boulder, Department of Computer Science & Institute of Cognitive Science

1. **Computer Science**, *Child-Robot Interaction*

Advisor: Tom Yeh, Co-Director of the Center for the Brain, AI, and Children

2. **Cognitive Science**, *Metacognitive Reflection*

Advisor: Clayton Lewis, Co-Director at the Coleman Institute for Cognitive Disabilities

3. **Neuroscience**, *Trauma Resilience*

Advisor: Eliana Colunga, Director of the CU Boulder Language Project

05/2020 **Master of Science in Computer Science**

University of Colorado Boulder, Department of Computer Science

01/2012 – **Bachelor of Arts in Computer Science, Class Rank #1**

12/2015 University of Colorado Boulder, Department of Computer Science

08/2009 – **Early Childhood Educator Certification**

06/2011 Front Range Community College

Experience

- 09/2021 – **University of California Irvine**
Computing Innovation Fellow
Mentor: Dr. Mark Warschauer
- 02/2016 – **MindScribe.org**
Founder & Director
Boulder, Colorado
- 08/2015 – **Department of Computer Science**
07/2021 Graduate Researcher at the University of Colorado Boulder
Committee: Drs. Tom Yeh, Clayton Lewis, Mike Eisenberg, and Mark Gross
- 08/2014 – **Graphic, Inc. (acquired by Amazon for Alexa)**
07/2015 Data Engineer
Santa Barbara, California
- 06/2014 – **Graphic, Inc.**
07/2014 Product Management Intern
Santa Barbara, California
- 10/2013 – **Sikuli Lab**
05/2014 Research Assistant at the University of Colorado Boulder
with Dr. Tom Yeh
- 08/2012 – **Center for Health and Addiction: Neuroscience, Genes, & the Environment**
08/2013 Research Assistant at the University of Colorado Boulder
with Dr. Kent Hutchison
- 01/2012 – **Cognitive Development Center**
12/2013 Research Assistant at the University of Colorado Boulder
with Dr. Yuko Munakata
- 01/2012 – **Jones Lab for Human Learning**
05/2012 Research Assistant at the University of Colorado Boulder
with Dr. Matt Jones
- 08/2007 – **Children's House Preschool**
05/2011 Preschool Teacher
Boulder, Colorado

Publications

Layne Jackson Hubbard, Yifan Chen, Eliana Colunga, Pilyoung Kim, Tom Yeh. (2021, June). **Child-Robot Interaction to Integrate Reflective Storytelling Into Creative Play.** *In Proceedings of the 2021 ACM Conference on Creativity and Cognition.*

Layne Jackson Hubbard, Shanli Ding, Vananh Le, Pilyoung Kim, Tom Yeh. (2021, July). **Voice Design to Support Young Children's Agency in Child-Agent Interaction.** *In Proceedings of 2021 ACM Conference on Conversational User Interfaces.*

Layne Jackson Hubbard, Boskin Erkocevic, Dylan Cassady, Chen Hao Cheng, Andrea Chamorro, Tom Yeh. (2018, March). **MindScribe: Toward Intelligently Augmented Interactions in Highly Variable Early Childhood Environments.** *In Proceedings of the 23rd International Conference on Intelligent User Interfaces Companion* (pp. 1-2).

Layne Jackson Hubbard, Chen Hao Cheng, Boskin Erkocevic, Dylan Cassady, Andrea Chamorro. (2018, March). **MindScribe: Reflective Inquiry through Scaffolded Storytelling for Low-Income and Multilingual Early Childhood Communities.** *In Companion of the 2018 ACM/IEEE International Conference on Human-Robot Interaction* (pp. 345-346).

Fellowships

- 2021–2023 **Computing Innovation Fellowship, CRA/CCC & NSF-funded.** (2 year postdoctoral research salary).
- 2017–2020 **Graduate Research Fellowship, National Science Foundation.** Building a System to Guide Reflective Interaction for Early Childhood Empowerment. (3 years tuition & stipend)
- 2015–2017 **Chancellor’s Fellowship, University of Colorado Boulder.** (2 years tuition & stipend)

Awards

- 2021 **Institute of Cognitive Science, University of Colorado Boulder Research Award**
- 2019 **LEGO® Idea Conference Selected Cohort**
- 2018 **OpenIDEO Early Childhood Innovation Prize for MindScribe (\$80,000)**
- 2018 **BizWest ‘Innovation Quotient’ IQ Award in Education for MindScribe**
- 2018 **Catalyze CU Venture Accelerator Selected Cohort for MindScribe**
- 2018 **DEF CON Hacking Conference, Women in Security and Privacy Selected Cohort**
- 2018 **Outstanding PhD Poster in Computer Science, University of Colorado Boulder 1st Prize**
- 2018 **Student Design Competition, ACM Conference on Human Robot Interaction 2nd Prize**
- 2017 **Alexa Skills Hackathon, CapitalOne DevExchange at GlueCon 2nd Prize**
- 2014 **Mobile App Track, New Venture Challenge Best Minimum Viable Product**
- 2014 **University of Colorado Boulder Graduation with Distinction**
- 2014 **Phi Beta Kappa Honors Society**

Selected Scholarships

2013-2014 **Guardian Scholar Program for Former Foster Youth**

2013 **Dean's Merit Scholars Award**

2013 **Bennett Family Foster Youth Scholarship**

2013 **Jacob Van Ek Scholars Award**

2013 **Individual Research Grant, Undergraduate Research Opportunities Program**

2013 **Multicultural & Low-Income Scholarship, Community Action Development Award**

2013 **Shirley Maxine Stroh Scholarship**

2012 **Women in STEM Scholarship, Colorado Business Women's Association**

In the News

05/2021 **Press.** *First year's robotics work will help kids tell their stories*

10/2018 **Press.** *BizWest names winners for IQ Awards honoring innovation*

10/2018 **Press.** *BizWest is honored to name over 100 finalists for this year's Boulder Valley IQ Awards*

09/2018 **Interview.** *My faculty mentors understood my nontraditional experiences and were committed to supporting my vision*

08/2018 **Press.** *Seven Inspiring Startups from the CU Ecosystem*

06/2018 **Press.** *Computer science startup earns early childhood innovation prize*

05/2018 **Press.** *A million dollars, 570 hopefuls, and 15 winners: How a new competition aims to boost babies and toddlers*

05/2018 **Press Release.** *MindScribe wins an OpenIDEO Early Childhood Innovation Prize*

05/2018 **Press.** *Boulder Startup Week: Bottom line not always measured in dollars*

11/2017 **Interview.** *The Neural Network: Interview with Layne Hubbard*

09/2017 **Interview.** *NSF winner designs voice interactions to empower early childhood development*

10/2016 **Podcast.** *Still Myself: A Neuroscience Story*

05/2014 **Interview.** *Graduating student to use computer science to help solve community issues*

03/2014 **Authored.** *How to be an activist in the classroom*

10/2014 **Authored.** *Get to know the staff: Layne's world*

Invited Talks & Demos

- 05/2021 **Invited Talk on “Child-Agent Interaction to Integrate Reflective Storytelling Into Creative Play”**
Digital Learning Lab, University of California Irvine
- 02/2020 **Keynote speaker for the Early Childhood Innovation & AI Ethics Hackathon**
T9 Hacks, University of Colorado Boulder (sponsored by the National Head Start Association)
- 01/2020 **Keynote speaker for the 7th Annual Celebration of Scholarships Luncheon**
University of Colorado Boulder (hosted by the Chancellor) — [Watch Video](#)
- 11/2019 **Keynote speaker for the Guardian Scholars 10-Year Anniversary Celebration**
University of Colorado Boulder (hosted by the Chancellor) — [Watch Video](#)
- 07/2019 **Panelist on AI Ethics in Early Childhood**
Headstarter Conference (hosted by the National Head Start Association)
- 05/2019 **Panelist on Entrepreneurship & Innovation in Early Childhood**
Boulder Startup Week
- 11/2018 **Invited Pitch on MindScribe, NSF Center on Pervasive Personalized Intelligence**
University of Colorado Boulder (hosted by Evan Chang and Danny Dig)
- 11/2018 **Invited Pitch on MindScribe, Inaugural San Francisco Alumni Event**
Plug and Play Tech Center, Sunnyvale, CA (hosted by CU Boulder Engineering)
- 05/2018 **Panelist on Emerging Technologies for Social & Environmental Impact**
Boulder Startup Week — [Read Article](#)
- 05/2017 **Invited Demo on MindScribe, ACM CHI Conference Host Party**
Department of Information Science, University of Colorado Boulder (hosted by Ricarose Roque)
- 09/2017 **Talk on “Young Children as Intellectual and Creative Partners in Discovery”**
ATLAS Institute Research Seminar (hosted by Laura Devendorf) — [Watch Video](#)
- 07/2017 **Podcast on Neuroscience, Stories about Science Podcast**
E-Town Boulder (hosted by the Story Collider) — [Listen to Podcast](#)

Teaching

Guest Lectures

- Fall 2021* **CSCI 436/536: Human Robot Interaction**
Instructor: Prof. Tom Williams
Departments of Computer Science and Mechanical Engineering, Colorado School of Mines
- Spring 2020* **CSCI 7000: Advances in AI and Neuroscience**
Instructor: Prof. Tom Yeh
Department of Computer Science, University of Colorado Boulder

- Fall 2018* **CSCI 3002: Fundamentals of Human Computer Interaction**
Instructor: Profs. Ellen Do & Shaun Kane
ATLAS Institute, University of Colorado Boulder
- Fall 2018* **CSCI 7000: Technology & the Young**
Instructor: Prof. Mike Eisenberg
Department of Computer Science, University of Colorado Boulder
- Fall 2017* **CSCI 3002: Fundamentals of Human Computer Interaction**
Instructor: Prof. Tom Yeh
Department of Computer Science, University of Colorado Boulder
- Fall 2017* **CSCI 7000: Technology & the Young**
Instructor: Prof. Mike Eisenberg
Department of Computer Science, University of Colorado Boulder
- Fall 2015* **CSCI 4817/5817: Database Systems (Watch: Finding a Bug in MySQL)**
Instructor: Prof. Richard Osborne
Department of Computer Science, University of Colorado Boulder

Guest Judge

- Spring 2018* **ATLS 4519/5519: Machine Learning for HCI (Project Feedback)**
Instructor: Prof. Ben Shapiro
ATLAS Institute, University of Colorado Boulder
- Spring 2016* **CSCI 4830/5830: Rapid Prototyping (Project Judge)**
Instructor: Prof. Tom Yeh
Department of Computer Science, University of Colorado Boulder
- Fall 2015* **CSCI 4830/5830: Big Data (Hackathon Judge)**
Instructor: Prof. Tom Yeh
Department of Computer Science, University of Colorado Boulder

Teaching Panels

- Fall 2020* **CSCI 1000: Computer Science as a Field of Work and Study**
Instructor: Prof. Clayton Lewis
Department of Computer Science, University of Colorado Boulder
- Fall 2018* **INFO 7000: Introduction to Doctoral Studies in Information Science**
Instructor: Prof. Leysia Palen
Department of Information Science, University of Colorado Boulder
- Fall 2017* **CSCI 1000: Computer Science as a Field of Work and Study**
Instructor: Prof. Clayton Lewis
Department of Computer Science, University of Colorado Boulder
- Fall 2016* **CSCI 4348: Startup Essentials (Watch: Entrepreneurial Computing Projects)**
Instructors: Zach Nies & Prof. Rick Han
Department of Computer Science, University of Colorado Boulder

Teacher Training

Fall 2020 **Center for Teaching and Learning, University of Colorado Boulder**
How to be Anti-Racist in the Classroom
Disability Access: What You Need to Know as an Instructor
Student Support and Case Management Counseling and Psychiatric Services
Transitioning Roles: What to Expect as a First-Time Teaching Assistant
Keeping Your Options Open: Strategies and Resources for Non-Academic Careers
Finding Your Fit and Knowing Your Role as a Graduate Student
Getting Started with Contemplative Pedagogy
Using Humor in the Classroom
The University Lecture

Mentoring

Since 2017, I have mentored 24 high school, undergraduate, and graduate students spanning several disciplines across engineering and linguistics. For all college students, I developed recruiting materials, interviewed, hired, onboarded, and supervised our fantastic interns.

- 2020-2021* **Arva Syed**
Undergraduate student in Creative Technology & Design
University of Colorado Boulder
Project: *Prototyping multimodal systems for multilingual child-robot interaction*
- 2021* **Jasey Chanders**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Prototyping tactile systems to support children's agency in multilingual child-robot interaction*
- 2021* **Alexander Ayala**
Undergraduate student in Mechanical Engineering
University of Colorado Boulder
Project: *Prototyping accessible tactile systems for children who are blind and visual impaired*
- 2021* **Emma King**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Prototyping multimodal systems for multilingual child-robot interaction*
- 2020* **Aarjav Chauhan**
Graduate student in Creative Technology & Design
University of Colorado Boulder
Project: *Analyzing children's creative stories for linguistic indicators of reflection*
- 2020* **Shanli Ding**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Researching text-to-speech systems for synthesizing playful voices in child-robot interaction*

- 2020 **Vananh Le**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Researching text-to-speech systems for synthesizing playful voices in child-robot interaction*
- 2020 **Yifan Chen**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Analyzing children's cHRI storytelling data for measures of usability & engagement*
- 2020 **Kayla Kohake**
Master's graduate in Linguistics
University of Colorado Boulder
Project: *Analyzing children's stories for indicators of metacognitive reflection*
- 2018-2020 **Chloe Brown**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Developing mobile and tactile applications for child-robot interaction*
- 2018-2020 **Samuel Nesmith**
Undergraduate student in Mechanical Engineering
University of Colorado Boulder
Project: *Prototyping multimodal & tactile interactions for child-robot reflective storytelling*
- 2018 **Elsa Velazquez**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Integrating musical elements into child-robot voice interaction*
- 2018 **Bharat Narayanasamy**
High School Student
Science Discovery, STEM Research Experience Program
Project: *Analyzing teacher interviews to inform developmentally appropriate practice*
- 2018 **Sloan Woodberry**
High School Student
Science Discovery, STEM Research Experience Program
Project: *Designing tactile interactions in child-robot reflective storytelling*
- 2018 **Andrea Chamorro Quillupangui**
Undergraduate student in Computer Science
University of Colorado Boulder
Project: *Developing a multilingual voice platform for child-robot interaction*
- 2018 **Mel Plett**
Graduate student in Creative Technology & Design
University of Colorado Boulder
Project: *Designing stuffed animal embodiments for child-robot interaction*

2018 **Vi Nguyen**

Undergraduate student in Business Administration

University of Colorado Boulder

Project: *Designing stuffed animal embodiments for multilingual child-robot interaction*

2017-2018 **Boskin Erkocevic**

Undergraduate student in Electrical Engineering

University of Colorado Boulder

Project: *Developing a mobile application for dynamic listening in multilingual child-robot interaction*

2017-2018 **Chen Hao Cheng**

Undergraduate student in Computer Science

University of Colorado Boulder

Project: *Prototyping a mobile web application for multilingual child-robot interaction*

2017-2018 **Dylan Cassady**

Undergraduate student in Mechanical Engineering

University of Colorado Boulder

Project: *Analyzing children's stories for linguistic indicators of engagement and complexity*

2017 **Christopher Zhu**

High School Student

Science Discovery, STEM Research Experience Program

Project: *Transcribing and translating children's oral stories for linguistic analysis*

2017 **Jamie Schreiber**

High School Student

Science Discovery, STEM Research Experience Program

Project: *Transcribing and translating children's oral stories for linguistic analysis*

2017 **Elise Carter**

Undergraduate student in Computer Science

University of Colorado Boulder

Project: *Transcribing and translating children's oral stories into physical artifacts*

2017 **Joia Reeder**

Undergraduate student in Technology, Arts, & Media

University of Colorado Boulder

Project: *Transcribing and translating children's oral stories into physical artifacts*

Service

2019 – present **AI Ethics in Early Childhood, Working Group**

National Head Start Association

2017 – present **Volunteer Substitute Preschool Teacher**

Children's House Preschool

2013 – present **Guardian Scholar Mentor for Former Foster Youth**

University of Colorado Boulder

- 2019 – 2020 **Innovation Mentor**
Futurebound Colorado, Early Childhood Innovation Ecosystem
- 2018 **Innovation Mentor**
OpenIDEO, Early Childhood Innovation Network
- 2016 – 2017 **Childcare Volunteer**
Boulder SURJ, Showing Up for Racial Justice
- 2014 – 2017 **Entrepreneurial Student Board Member**
New Venture Challenge, University of Colorado Boulder

Conferences

- 2018 – 2021 **Reviewer**
2021 Human Factors in Computing Systems (CHI)
2020 FabLearn
2018 Designing Interactive Systems (DIS)
- 2017 **Student Volunteer**
CHI 2017

Graduate

- 2020 – present **Faculty Search Committee**
College of Engineering and Applied Science
- 2020 – present **Antiracism & Inclusion Committee**
Department of Computer Science
- 2020 – present **Student Funding Awards Committee**
Institute of Cognitive Science
- 2019 – present **Executive Committee**
Department of Computer Science
- 2016 **Student Volunteer, Faculty Search Committee**
Department of Computer Science

Undergraduate

- 2013 – 2014 **Director of Academic Affairs**
CU Boulder Student Government
- 2013 – 2014 **AMA "Ask Me Anything" Fellow**
Department of Computer Science
- 2013 – 2014 **Chair of the Undergraduate Advisory Committee**
Department of Computer Science
- 2012 – 2013 **Finance Board Member**
CU Boulder Student Government

2012 – 2013 **Health Center Board Member**
CU Boulder Student Government

2012 – 2013 **Vice President**
Neuroscience Club
Presented to the Board of Regent to create a new Bachelor's degree in Neuroscience

References

- **Clayton Lewis**
Professor
Department of Computer Science, University of Colorado Boulder
clayton.lewis@colorado.edu
- **Tom Yeh**
Associate Professor
Department of Computer Science, University of Colorado Boulder
tom.yeh@colorado.edu
- **Eliana Colunga**
Associate Professor
Department of Psychology and Neuroscience, University of Colorado Boulder
eliana.colunga@colorado.edu
- **Ken Anderson**
Chair
Department of Computer Science, University of Colorado Boulder
kena@colorado.edu
- **f6s.com**
Read recommendations from 20+ professionals, including Drs. Sriram Sankaranarayanan, Tomasz Miaskiewicz, Gabe Johnson, Richard Han, Nikolaus Correll, Ken Anderson, and Clayton Lewis.