Jean SALAC

PhD Student | Computer Science Education

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My research focuses on program comprehension at the K-12 level. Contributions include the investigation of factors critical to program comprehension for young learners, code comprehension strategies for struggling learners, and *Personalized Assessment Worksheets* for Scratch (PAWS) tool, a custom assessment generator software for Scratch projects. I was motivated to pursue this doctoral research due to my passion for making computer science instruction accessible and effective to people from under-served communities. Through this work, I hope to make computing accessible for everyone and to close the digital divide in today's increasingly technological world.

Education

2017-Present	Doctor of Philosophy | Computer Science | University of Chicago
2020	Master of Science | Computer Science | University of Chicago
2017	Bachelor of Science | Computer Science | University of Virginia | High Distinction

Peer-Reviewed Publications

Accepted

2020 **Jean Salac** and Diana Franklin. "If They Build It, Will They Understand It?: Exploring the Relationship between Student Code and Performance." Research Paper in the *25th Annual Conference on Innovation and Technology in Computer Science Education*, 2020.

2020 **Jean Salac**, Cathy Thomas, Bryan Twarek, William Marsland, and Diana Franklin. "Comprehending Code : Understanding the Relationship between Reading and Math Proficiency, and 4th-Grade CS Learning Outcomes." Research Paper in the *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, 2020.

2020 **Jean Salac**, Cathy Thomas, Chloe Butler, Ashley Sanchez, and Diana Franklin. "TIPP&SEE : A Learning Strategy to Guide Students through Use–>Modify Scratch Activities." Research Paper in the *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, 2020.

2020 **Jean Salac**, Qi Jin, Zipporah Klain, Saranya Turimella, Max White, and Diana Franklin. "Patterns in Elementary-Age Student Responses to Personalized & Generic Code Comprehension Questions." Research Paper in the *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, 2020.

2020 Diana Franklin, **Jean Salac**, Cathy Thomas, Zené Sekou and Sue Krause. "Eliciting Student Scratch Script Understandings via Scratch Charades." Experience Report in the *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, 2020.

2019 **Jean Salac**, Max White, Ashley Wang, and Diana Franklin. "An Analysis through an Equity Lens of the Implementation of Computer Science in K-8 Classrooms in a Large, Urban School District." Research Paper in the *Proceedings of the 50th ACM Technical Symposium on Computer Science Education*, 2019.

2018 David Weintrop, Afsoon Afzal, **Jean Salac**, Patrick Francis, Boyang Li, David C. Shepherd, and Diana Franklin. "Evaluating CoBlox : A comparative study of robotics programming environments for adult novices." In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 2018. **Best Paper Honorable Mention**

2017 Daniel S. Katz, Kyle E. Niemeyer, Sandra Gesing, Lorraine Hwang, Wolfgang Bangerth, Simon Hettrick, Ray Idaszak, **Jean Salac**, Neil Chue Hong, Santiago Nunez-Corrales, Alice Allen, R. Stuart Geiger, Jonah Miller, Emily Chen, Anshu Dubey, and Patricia Lago. "Fourth workshop on sustainable software for science : practice and experiences (WSSSPE4)." *Journal of Open Research Software* 6, no. 1 (2018).

In Submission

2020 **Jean Salac** and Diana Franklin. "Why Access isn't Enough : An Analysis of Elementary-Age Students' Computational Thinking Performance through an Equity Lens." Research Paper in the *Journal of Computer Science Education*, 2019.

2020 **Jean Salac**, Rider Foley, and Araba Dennis. "Thinking inside the Box : Problematic Demographic Categories for Immigrants and refugees" *Journal of Engineering Studies*, 2019.

Research Experience

Present – July 2017 | **Research Assistant, University of Chicago, PI : Prof. Diana Franklin (CANON Lab)**

- Research barriers to learning programming and develop strategies to overcome them
- Develop *Personalized Assessment Worksheets for Scratch (PAWS)* tool, a written assessment generator that uses code from student Scratch projects
- Analyzed data for *Robot Turtles* study, a programming board game that aims to teach basic computational thinking concepts
- Analyzed data for *CoBlox* study, an industrial programming language for robots

Python | R | Quantitative Analysis : ANOVA, Regression | Qualitative Analysis : Content Analysis

May 2017 – Jan 2016 | **Research Assistant, University of Virginia, PIs : Prof. Luther Tychonievich, Prof. Rider Foley**

- Researched the evolution of immigrant and refugee education in the US through analyzing landmark court cases and legislation
- Researched the impact of informal computer science education on low-income minority girls through interviews and ethnography

Clinical Interviews | Survey Design | Ethnography | Document Analysis | Actor-Network Theory

Honors and Awards

2019 Graduate Research Fellowship, National Science Foundation
2019 Bridge Builder Leadership Award, University of Chicago
2019 Computer Science Department Teaching Award, University of Chicago
2019 Physical Science Division Teaching Award Nomination, University of Chicago
2018 Graduate Student Leadership Award, University of Chicago
2017 Rader Award for Undergraduate Research, University of Virginia
2016 AAPI Young Leader, White House Initiative for Asian-Americans and Pacific Islanders (WHIAAPI)

Grants

Research Grants

2019 Graduate Research Fellowship, National Science Foundation ($138,000)
2016 The Jefferson Trust, University of Virginia ($10,320)
2016 Parents Fund Internship Grant, University of Virginia ($4000)

Travel Grants

2019 Tapia Celebration of Diversity in Computing, Two Sigma ($500)
2019 International Computing Education Research (ICER) Conference Doctoral Consortium, Association for Computing Machinery ($600)
2019 CRA-URMD Grad Cohort, Computing Research Association ($1500)
2018 CRA-W Grad Cohort, Computing Research Association ($1000)
2017 Grace Hopper Celebration of Women in Computing, University of Chicago ($1000)
2016 Workshop for Sustainable Software for Science : Practices & Experiences ($1500)
2016 Grace Hopper Celebration of Women in Computing, University of Virginia ($1000)
2016 SIGCSE Travel Grant, University of Virginia ($500)

Presentations

2020 **Jean Salac**, Diana Franklin, Cathy Thomas. "TIPP&SEE : A Previewing & Navigating Strategy for Use/Modify Scratch Activities", Presentation at the 2020 Conference of the *American Educational Research Association*

2020 Diana Franklin, **Jean Salac**, Cathy Newman Thomas, Jennifer L. Palmer, Merijke Coenraad, Melissa Cobian, Kris Beck, Andy Rasmussen, David Weintrop. "TIPP&SEE - Supporting Struggling Learners in Elementary CS Instruction", Presentation at the 2020 Conference of the *American Educational Research Association*

2020 Diana Franklin, Jennifer Palmer, Jasmine Marckwordt, Randall Landsberg, Alexandria Muller, Kartik Singhal, **Jean Salac** and Danielle Harlow. "Initial Learning Trajectories for K-12 Quantum Computing", Presentation at the *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, 2020.

2019 Cathy Thomas, Diana Franklin, & **Jean Salac**. "Teacher Perspectives of Year-Long Professional Development in Inclusive Elementary Computer Science.", Poster at annual meeting of the *Teacher Education Division of the Council for Exceptional Children.*

2019 **Jean Salac**, Cathy Thomas, Diana Franklin. "Comprehending Code : Understanding the Relationship between Reading and Math Proficiency, and 4th-Grade CS Learning Outcomes.", Poster at *Tapia Celebration of Diversity in Computing*

2019 **Jean Salac**. "Personalized Assessment Worksheets for Scratch (PAWS) : Exploring a Bridge between Interviews, Written Assessments, and Artifact Analysis", Doctoral Consortium Presentation at International Computing Education Research (ICER) Conference

2019 **Jean Salac**. "Comprehending Code : Developing Computer Science learning strategies to advance Equity", Presentation at *Soapbox Science Chicago*

2019 **Jean Salac**. "Comprehending Code", Poster at *CRA-URMD Grad Cohort*

2017 **Jean Salac**. "The Invisibility of Immigrant & Refugee Students in Computer Science Education", Poster at *Science and Technology Global Conference*

2017 **Jean Salac**. "A Study of the Impact of Informal Computer Science Education on Low-Income Minority Girls", Lightning Talk at *ACM Capital Region Celebration of Women in Computing*

Teaching Experience

Dec 2018 – Sept 2017
Teaching Assistant, Computers for Learning, University of Chicago
- Designed programming assignments for the development of a 2D game engine
- Instructed students and led lab sessions

Java | IntelliJ

May 2017 – Jan 2017
Teaching Assistant, Human-Computer Interaction, University of Virginia
- Aided in the development and evaluation of student assignments
- Mentored students on their independent projects
- Instructed students at office hours

User-Centered Design

May 2017 – Aug 2016
Teaching Assistant, Computer Architecture, University of Virginia
- Aided in the development and evaluation of student assignments
- Instructed students at office hours and led lab sessions
- Learned basic pedagogical techniques in a companion course

C/C++ | Assembly

Service

Present – May 2020
Graduate Fellow, CRA Education, Computing Research Association
- CRA-E promotes the health of the computing research pipeline by promoting undergraduate research, providing resources to faculty to prepare talented students for research, and encouraging undergraduates to pursue graduate education and research careers in computing fields
- Help with research spotlights and initiatives to promote undergraduate research

Present
Aug 2018

CS Representative, Graduate Recruitment Initiative Team (GRIT), University of Chicago
- GRIT is a grassroots student organization that is committed to enhancing diversity, inclusion, and equity in UChicago STEM graduate programs
- Act as a liaison to integrate GRIT's recruitment and retention practices in my department

Present
Jan 2019

Co-organizer, Women in STEM Symposium, University of Chicago
- Organize panel discussions
- Research and invite speakers
- Apply for grants to support the annual Women in STEM symposium

Present
Feb 2019

CS Representative, Committee on Equity, Diversity, & Inclusion, University of Chicago
- Develop institutional policy for equity, diversity and inclusion for the Physical Sciences Division, which encompasses CS
- Advocate for graduate students who are from under-represented groups in computing
- Disseminate diversity-related resources in my department
- Organize activities that aim to recruit and retain diverse students

Present
2019

Program Committee Member, SIGCSE Technical Symposium, Association for Computing Machinery (ACM)
- Peer-reviewed papers submitted to the ACM SIGCSE Technical Symposium on K-12 CS education

March 2020

Online Organizing Committee Member, RESPECT Conference for Equity and Sustained Participation, Institute of Electrical and Electronics Engineers (IEEE)
- Helped facilitate the transition of the RESPECT conference from in-person to online amidst the COVID-19 pandemic
- Helped coordinate online paper and poster presentations and discussions

2019
2017

Student Volunteer, SIGCSE Technical Symposium, Association for Computing Machinery (ACM)
- Taught programming at the conference's kids camp
- Helped with conference setup and registration

Dec 2019
Jan 2018

Co-Chair & Founder, Graduate Women in CS (GWiCS), University of Chicago
- Advocated for female-identifying graduate students in our department
- Organized monthly activities to build a community of support
- Established and maintain connections with companies, i.e. Google, Microsoft

May 2018
Jan 2018

Co-organizer, Transcending Boundaries Research Symposium, University of Chicago
- The Transcending Boundaries research Symposium is an inaugural student-led and organized research symposium designed to highlight the work of under-represented minority graduate and post-doctoral scholars at the University of Chicago
- Reviewed research submissions
- Organized and facilitated panel discussions

Work Experience

Aug 2016
May 2016

Computer Science Education Intern, National Science Foundation, Alexandria, VA
- Analyzed prior NSF CS education and broadening participation initiatives
- Researched social innovation best practices to help shape President Obama's CS for All initiative

June 2017 – May 2013

Onsite Educator, National Air & Space Museum, Washington, DC

- Performed demonstrations to visitors to illustrate the science and history behind flight and space
- Attended professional training classes on public speaking, pedagogical methods, astronomy, and physics

Aug 2015 – May 2015

STEM Intern, Systemic Solutions, McLean, VA

- Redesigned the VEX Robotics programming curriculum used in Systemic Solutions summer camps
- Instructed elementary age students in the mechanical design and programming of VEX robots