

# Srinjita BHADURI

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INSTITUTE OF COGNITIVE SCIENCE, BOULDER CO, 80309

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## RESEARCH INTERESTS

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Human Computer Interaction (HCI), Learning Sciences, STEM Education, Educational Technology, 3D Printing and Modeling, and Augmented Reality

## PROFESSIONAL EXPERIENCE

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| Aug 2021<br>PRESENT   | Research Associate - Institute of Cognitive Science<br>University of Colorado Boulder<br>Researching and developing resources to support in school and out of school programs to integrate Computational Thinking and exploring ways to integrate mentoring by local STEM professionals to support explicit connections with local STEM careers and career pathways. |
| 2017<br>PRESENT       | Lab Manager, Sumner Lab<br>Responsible for organizing weekly lab meetings, getting new lab personnel set up, organizing research retreats, mentoring Masters and undergraduate students, and handling purchases for the Sumner Lab.  |
| Dec 2013<br>June 2014 | Programmer Analyst Trainee<br>Cognizant Technology Solutions, Levi's Strauss project<br>Developed automation tool in VB script for day-to-day activities performed by Support team.  |

## EDUCATION

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| 2021 | Dual PhD in Computer Science and Cognitive Science<br>University of Colorado Boulder<br>THESIS TOPIC: Teach3D: A Toolkit for Effective Teaching of 3D Modeling and Spatial Thinking Skills in Middle School<br>COMMITTEE: <a href="#">Tamara Sumner</a> (chair), Shaun Kane, Ellen Do, Tom Yeh, William Penuel |
| 2016 | M.S., Computer Science<br>University of Colorado Boulder<br>ADVISOR: <a href="#">Tom Yeh</a>   |
| 2013 | Bachelor of Technology, Computer Science and Engineering<br>West Bengal University of Technology, India  |

## RESEARCH EXPERIENCE

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- Jan 2020 | Graduate Research Assistant supervised by Dr. Tamara Sumner, CU, Boulder  
July 2021 | **Collaborative Research: STEM Career Connections: A Model for Preparing Economically-Disadvantaged Rural Youth for the Future Workforce**  
Researching ways to create rich learning experiences for middle school students in rural mountain school district in Colorado, i.e., Eagle County Schools (ECS) with 3D modeling and printing technologies to prepare economically-disadvantaged rural youth for the future workforce. Responsible for all aspects of developing tools, designing research instruments for data collection, and research data analysis. These activities also extend to recruiting participants, writing IRB documents, and collaborating with partners to provide formative feedback based on students, teachers, and other stakeholders.  
3 peer-reviewed first-author articles, 1 demo
- Jan 2016 | Graduate Research Assistant supervised by Dr. Tamara Sumner, CU, Boulder  
Aug 2019 | **Engineering experiences: Research on student competency, motivation and persistence in STEM for underserved youth**  
Worked on creating out-of-school time learning experiences for youth in middle and high school using Unmanned Aerial Vehicles (UAVs) and 3D modeling and printing technologies to introduce and engage underserved youth in engineering during out-of-school time and foster long-term interest and pathways into the field. Responsible for all aspects of developing tools, designing research instruments for data collection, and research data analysis. These activities also extend to recruiting participants, writing IRB documents, and collaborating with partners to provide formative feedback based on participant behavior.  
4 peer-reviewed first-author articles, 1 co-authored book chapter, 3 posters

## PUBLICATIONS

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### PEER REVIEWED CONFERENCE PAPERS

- [p.13] Q. Bidy, S. Bhaduri, J. Bush, C. H. Elliot, M. Recker, and T. Sumner. (2022) Co-designing Opportunities for Rural Middle School Youth to Engage with STEM Careers and Career Pathways. Paper accepted for presentation at *American Educational Research Association (AERA)*
- [p.12] S. Bhaduri, Q. Bidy, J. Bush, A. Suresh, and T. Sumner. 2021. 3DnST: A Framework Towards Understanding Children's Interaction with Tinkercad and Enhancing Spatial Thinking Skills. In *Interaction Design and Children, IDC* (pp. 257-267). [PDF](#)
- [p.11] S. Bhaduri, Q. Bidy, M. Rummel, J. Bush, J. Jacobs, M. Recker, J. Ristvey, and T. Sumner. 2021. Integrating Professional Mentorship with a 3D Printing Curriculum to Help Rural Youth Forge STEM Career Connections. Accepted for *2021 ASEE Annual Conference Exposition*. ASEE Conferences, Long Beach, California. [PDF](#)
- [p.10] S. Bhaduri, P. Gyory, and T. Sumner. 2020. 3DARVisualizer: Debugging 3D models using Augmented Reality. Demo presented at the *FabLearn Flagship conference*, NYC 2020 (organized virtually).
- [p.9] S. Bhaduri\*, H. Hedayati\*, T. Sumner, D. Szafir, and M. D. Gross. 2019. HugBot: A soft robot designed to give human-like hugs. In *Proceedings of the 18th ACM Conference on Interaction Design and Children (IDC '19)*. [PDF](#)  
\*Both authors contributed equally
- [p.8] S. Bhaduri, K. V. Horne, and T. Sumner. Designing an Informal Learning Curriculum to Develop 3D Modeling Knowledge and Improve Spatial Thinking Skills. 2019. In *Proceedings of the 2019 CHI Conference Extended Abstracts on Human Factors in Computing Systems (ACM)*. [PDF](#)

- [p.7] P. Chilana, N. Hudson, **S. Bhaduri**, P. Shashikumar, and S. K. Kane. (2018). Supporting Remote Real-time Expert Help: Opportunities and Challenges for Novice 3D Modelers. In *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '18)*. [PDF](#)
- [p.6] **S. Bhaduri**, K. V. Horne, J. Ristvey, R. Russell, and T. Sumner. (2018). Learning Engineering Practices Through Drones: Iterative design of an informal learning curriculum. In *Proceedings of the 13th International Conference of the Learning Sciences (ICLS)*. [PDF](#)
- [p.5] **S. Bhaduri**, K. V. Horne, J. Ristvey, R. Russell, and T. Sumner (2018). From toys to tools: UAVs in middle-school engineering education (RTP). In *2018 ASEE Annual Conference Exposition, Salt Lake City, Utah*. [PDF](#)
- [p.4] **S. Bhaduri**, P. Gyory, and T. Sumner. (2018). "Enhancing 3D Modeling with Augmented Reality in an after-school engineering program". In *2018 ASEE Annual Conference Exposition, Salt Lake City, Utah*. [PDF](#)
- [p.3] M. Skirpan, N. Beard, **S. Bhaduri**, C. Fiesler, and T. Yeh (2018). Ethics Education in Context: A Case Study of Novel Ethics Activities for the CS Classroom. In *Proceedings of the SIGCSE technical symposium on Computer science education (SIGCSE'18), Third Best Paper in the Track: Experience Reports and Tools*. [PDF](#)
- [p.2] **S. Bhaduri**, J. G. O. Tovar, and S. K. Kane. (2017). Fabrication Games: Using 3D Printers to Explore New Interactions for Tabletop Games. In *Proceedings of the 2017 ACM SIGCHI Conference on Creativity and Cognition*. Singapore. [PDF](#)
- [p.1] **S. Bhaduri**. (2017). Using 3D Modeling and Prediction as a Lens into Student Design Processes. In *Proceedings of the 2017 ACM SIGCHI Conference on Creativity and Cognition*. Singapore. [PDF](#)

#### BOOK CHAPTERS

- [b.1] **S. Bhaduri**, A. Gendreau, V. S. Koushik, T. Sumner, J. Ristvey, and R. Russell. (2018). Promoting Middle School Students' Motivation and Persistence in an After-School Engineering Program (J. Barnes-Johnson and J. M. Johnson, Eds.). In *STEM21: Equity in teaching and learning to meet global challenges of standards, engagement and transformation*. [DOI](#)

#### POSTERS PRESENTED

- [a.3] **S. Bhaduri** (2019). Supporting Spatial Thinking Skills in Novice 3D Modelers Through 3D Modeling and Augmented Reality. Poster presented at *Computing Research Association for Women, CRA-W, Chicago*.
- [a.2] **S. Bhaduri**, K. V. Horne, P. Gyory, H. N. Ngo, and T. Sumner. (2018) Enhancing 3D Modeling with Augmented Reality in an after-school engineering program. Poster presented at *ASEE Zone IV Conference 2018*.
- [a.1] **S. Bhaduri**, J. Ristvey, R. Russell, and T. Sumner. (2017). Promoting Middle School Students Motivation, Persistence, and Career Awareness in an After-school Program. Poster presented at the *annual STELAR ITEST PI and Evaluator Summit, Washington D.C.*

#### INVITED TALKS

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2020	Supporting Spatial Thinking Skills in Youth through 3DARVisualizer thriveWISE, DevPulseCon 2020   Hosted virtually on October 6
2019	Supporting Spatial Thinking Skills in Novice 3D Modelers through 3D Modeling and Augmented Reality University of Colorado Boulder, ATLAS Institute   March 12
2018	User Centered Design (CSCI 5839)   Guest Speaker Discussed different approaches to Hardware and Rapid Prototyping University of Colorado Boulder   October 2018
2014	Designing Tactile Pictures with Craft Materials for 3D Printing Co-presented talk at Teen's Science Cafe Denver, CO   March 14

## SERVICE

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Board Member	<b>EcosySTEM ARTS</b>   2020 - Present Mentor engineering team creating designs for children in hospitals
Student Rep	Graduate Student Advisory Board   2017-2019 College of Engineering and Applied Science (CEAS) University of Colorado Boulder
Core Member	TA Recruitment   2019 Department of Computer Science University of Colorado Boulder
Participant	CS Graduate Student Association (CSGSA)   2017-2019 University of Colorado Boulder
Reviewer	Selected for the CRA-W(omen) Grad Cohort   2019
Volunteer	CHI (2019-2022), ICRA (2020), SIGCSE (2020-2022), ASEE (2018-2021), Human Computer Interaction Journal (2018), IDC (2019-2021)
Volunteer	IDC 2020, CHI 2019, C&C 2017

## TEACHING EXPERIENCE

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DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF COLORADO BOULDER

Teaching Assistant	<b>Software Methods and Tools</b> Fall 2019, Summer 2016, Fall 2015, Summer 2015, Fall 2014 25-30 students, 1-2 sections <b>Intro to Programming - Level II</b> Spring 2015 30 students, 2 sections
Grader	<b>Human Centered Computing and Development</b> Summer 2017 <b>Intro to Programming</b> Fall 2014, Summer 2020

CU SCIENCE DISCOVERY

Summer Camp Facilitator	3D Printing & Wearable Electronics Academy with high-school students   2018 3D Printing summer camp with elementary-school students   2015
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## OUTREACH ACTIVITIES

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2018 | CU Science Ambassador, University of Colorado Boulder

## MENTORING EXPERIENCE

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Spring 2020	<b>Ketan Kamat</b> Undergraduate in Aerospace Engineering University of Colorado Boulder Modification of <i>3DARVisualizer</i> app for debugging 3D models
Fall 2019 Spring 2021	<b>Ayush Shekhar, Julietta Rozin</b> High-school students from Peak-to-Peak Charter School Supporting 3D modeling experiences with Augmented Reality (Secured first place in Science Research Symposium in Boulder district for the Computer Science and Math category)
Spring 2019	<b>Kellen Kennedy</b> Undergraduate in Biological and Chemical Engineering University of Colorado Boulder Approaches to design 3D modeling user studies
Fall 2017 Spring 2018	<b>Peter Gyory</b> PhD student in ATLAS Institute Designing Augmented Reality debugging app to support 3D modeling <b>Hannie Ngo</b> , Discovery Learning Apprentice Undergraduate in Computer Science University of Colorado Boulder Interaction Design & data mining in engineering education
Fall 2016 Spring 2017	<b>Jesus Ortiz Tovar</b> , Discovery Learning Apprentice Undergraduate in Computer Science, University of Colorado Boulder Using 3D Printers to Explore New Interactions for Tabletop Games
Summer 2015	<b>Lindsey Welch, Chantelle Humphries</b> 3D Printed braille <b>Dinah Bowman, Nueka Lo</b> , Post-processing Techniques to Enhance Tactile Textures Summer Research Mentor Program (REM) for high school students through CU Science Discovery. (Results were invited and presented at the White House)

## AWARDS AND HONORS

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2021	<b>Graduate Research Excellence – Outstanding Research Assistant</b> University of Colorado Boulder <b>Nominated for Outstanding Dissertation Award (Computer Science)</b> College of Engineering and Applied Sciences, University of Colorado Boulder
2018	<b>Outstanding Service Award</b> Department of Computer Science, University of Colorado Boulder
2016	<b>Early Career Professional Development Award</b> Department of Computer Science, University of Colorado Boulder
2015	<b>Outstanding Teaching Assistant Award</b> Department of Computer Science, University of Colorado Boulder <b>Best User Interaction</b> HackCU organized by University of Colorado Boulder

## GRANTS

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### UNIVERSITY OF COLORADO BOULDER

2021	CARTSS Graduate Student Award, CU, Boulder   \$1500
2020	Beverly Sears Graduate Student Grant   \$1000 Department of Computer Science Travel Grant   \$400
2019	Department of Computer Science Travel Grant   \$1000 Institute of Cognitive Science (ICS) Travel Grant   \$700
2018	Institute of Cognitive Science (ICS) Travel Grant   \$500

## SKILLS

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Programming	Python, C/C++, Java, JavaScript, HTML5/CSS, C#, R, three.js, Node.js
Fabrication	3D Modeling (TinkerCAD, SketchUp, Open(J)SCAD), 3D Printing, Sketching/Wireframing (Sketch), Laser Cutting, Unity game design
Research Techniques	User studies, Qualitative and Quantitative research, Survey design (Qualtrics)
Other	Microsoft Office tools including PowerPoint, Excel, Keynote, G-suite