Srinjita Bhaduri, Ph.D.

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Research Interests

Human-Centered Computing (HCC), Learning Sciences, STEM Education for underserved children, Educational Technology, Maker Technology, 3D Printing and Modeling, Spatial Thinking, and Augmented Reality

Education

2021	Dual Ph.D. in Computer Science and Cognitive Science University of Colorado Boulder Dissertation topic - Teach3D: A Toolkit for Effective Teaching of 3D Modeling and Spatial Thinking Skills in Middle School Committee: Tamara Sumner (chair), Shaun Kane, Ellen Do, Tom Yeh, William Penuel
2016	M.S., Computer Science University of Colorado Boulder
2013	Bachelor of Technology, Computer Science and Engineering West Bengal University of Technology, India

Professional and Research Experience

July 2023 Present	Research Scientist II - Institute of Cognitive Science University of Colorado Boulder
2017 Present	Lab Manager, Sumner Lab University of Colorado Boulder
Aug 2021 June, 2023	Research Scientist I - Institute of Cognitive Science University of Colorado Boulder
Jan 2020 July 2021	Graduate Research Assistant supervised by Dr. Tamara Sumner, CU, Boulder **Collaborative Research: STEM Career Connections: A Model for Preparing Economically-Disadvantaged Rural Youth for the Future Workforce**
Jan 2016 Aug 2019	Graduate Research Assistant supervised by Dr. Tamara Sumner, CU, Boulder **Engineering experiences: Research on student competency, motivation and persistence in STEM for underserved youth**
Dec 2013 June 2014	Software Engineer Cognizant Technology Solutions, Levi Strauss project

Publications

Peer Reviewed Journal Articles

[j.1] **S. Bhaduri**, Q. Biddy, C. H. Elliott, J. Jacobs, M. Rummel, J. Ristvey, T. Sumner, and M. Recker. (2022). Co-designing a rural research practice partnership to design and support STEM pathways for rural youth. *Theory Practice in Rural Education*, 12(2), 45-70. PDF

Peer Reviewed Conference Papers

[p.18] **S. Bhaduri**, and Q. Biddy (2024). STEMentor: A Mentorship Typology for Supporting Effective

Youth-Mentor Interactions in Rural Communities. Paper accepted for the *American Educational Research Association* (AERA).

[p.17] M. Schneider, J. Nixon, **S. Bhaduri**, and C. H. Elliott (2024). Navigating Tensions within the Co-design Process to Generate Debugging Resources for Middle School STEM Classrooms. Paper submitted to the *American Educational Research Association* (AERA).

[p.16] Q. Biddy, J. Nixon, **S. Bhaduri**, J. Jacobs, M. Recker, and J. Bush (2023) From codesign to co-adaptation: The evolution of professional learning across a long-term research practice partnership. Paper submitted to the special issue of Science Education on teacher learning and practice within organizational contexts.

[p.15] J. Nixon, C. H. Elliott, M. Schneider, J. Bush, **S. Bhaduri**, and M. Recker (2023) Teachers' Learning to Support Students During Science Inquiry: Managing Student Uncertainty in a Debugging Context. Paper presented at Annual meeting of the *International Society of the Learning Sciences* (ISLS).

[p.14] **S. Bhaduri**, C. H. Elliot, and Q. Biddy. (2023) Local Mentors' Role in Rural STEM Pathways: Precarities and Possibilities. Paper presentated at *American Educational Research Association* (AERA). PDF

[p.13] Q. Biddy, **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 presented at *American Educational Research Association* (AERA). PDF

[p.12] **S. Bhaduri**, Q. Biddy, 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. Biddy, 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). PDF

[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.5] G. Benedis-Grab, Q. Biddy, **S. Bhaduri**, J. Jacobs, A. Gendreau, J. Bush, T. Sumner. (accepted). Supporting Computationally-Rich Science Instruction: Conceptual Models for CT-Integrated Science Curriculum and Professional Learning. Roundtable to be presented at the *2024 National Association for Research in Science Teaching (NARST) annual meeting*. Denver, CO.

[a.4] Q. Biddy, J. Nixon, **S. Bhaduri**, J. Jacobs, M. Recker, J. Bush (accepted). From co-design to co-adaptation: The evolution of professional learning across a long-term research practice partnership. Poster to be presented at the 2024 *National Association for Research in Science Teaching (NARST) annual meeting*. Denver, CO.

[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*.

Teaching Experience

Department of Computer Science, University of Colorado Boulder

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

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

Mentoring Experience

Spring 2020	**Ketan Kamat** Undergraduate in Aerospace Engineering University of Colorado Boulder Modification of *3DARVisualizer* app for debugging 3D models
Fall 2019 Spring 2021	**Ayush Shekhar, Julietta Rozin** 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	**Kellen Kennedy** Undergraduate in Biological and Chemical Engineering University of Colorado Boulder Approaches to design 3D modeling user studies
Fall 2017 Spring 2018	**Peter Gyory** PhD student in ATLAS Institute Designing Augmented Reality debugging app to support 3D modeling **Hannie Ngo**, Discovery Learning Apprentice Undergraduate in Computer Science University of Colorado Boulder Interaction Design & data mining in engineering education
Fall 2016 Spring 2017	**Jesus Ortiz Tovar**, Discovery Learning Apprentice Undergraduate in Computer Science, University of Colorado Boulder Using 3D Printers to Explore New Interactions for Tabletop Games
Summer 2015	**Lindsey Welch, Chantelle Humphries** 3D Printed braille **Dinah Bowman, Nueka Lo**, 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)

Outreach Activities

2018	CU Science Ambassador, University of Colorado Boulder

Awards and Honors

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

Service

Board Member	EcosySTEM ARTS | 2020 - Present Mentor engineering teams to bring STEM education to children in hospitals
Organizing Committee	IDC 2023
Invited	NSF Panel Reviewer
Invited Reviewer	For over 75 manuscripts for ACM Computer Human Interaction (2019-Present), IEEE International Conference on Robotics and Automation (ICRA) (2020), ACM Special Interest Group on Computer Science Education (SIGCSE) (2020-Present), American Society for Engineering Education (ASEE) (2018-Present), Human-Computer Interaction Journal (2018), ACM Interaction Design for Children (2019-Present), International Journal for Child-Computer Interaction (2022-Present), Journal for Theory and Practice in Rural Education (2022-Present)
Student Rep	Graduate Student Advisory Board | 2017-2019 College of Engineering and Applied Science (CEAS) University of Colorado Boulder
	TA Recruitment | 2019 Department of Computer Science University of Colorado Boulder
Founding Member	CS Graduate Student Association (CSGSA) | 2017-2019 University of Colorado Boulder
Participant	Selected for the Computing Research Association CRA-W(omen) Grad Cohort | 2019
Volunteer	IDC 2020, 2023, CHI 2019, C&C 2017

Grants

External Grants

Under Review	Co-PI, NSF AISL - Pertenecemos en STEM: A Transformative STEM Partnership Centering Latinx Families Full grant amount: $1,999,810
Under Review	Co-PI, NSF Innovative Technology Experiences for Students and Teachers (ITEST) - Collaborative Research: SEI: Scaling, Expanding, and Iterating the STEM Career Connections Model to Prepare Economically-disadvantaged Rural Youth for the Future Workforce Full grant amount: $3,500,000

Internal Grants, University of Colorado Boulder

2023	ACM Gary Marsden Travel Award | $2200
2022	NSF National AI Institute for Student-AI teaming, Trainee Grant | $2500 with Layne Jackson Hubbard and Santiago Ojeda Ramirez (University of California, Irvine)
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

Invited Talks

2022	Teach3D: Toolkit for Effective Teaching of 3D Modeling and Spatial Thinking Skills in Middle School, Digital Learning Lab, University of California, Irvine | February 18
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

Skills

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