

CURRICULUM VITAE

Pratim Sengupta

Research Chair in STEM Education
Professor, Learning Sciences
Director, Mind, Matter & Media Lab
University of Calgary, Alberta, CA
Email: Pratim.sengupta@ucalgary.ca
Phone: 5875780657

Google Scholar:
<https://scholar.google.ca/citations?user=CgqUp0AAAAJ&hl=en>
Website: <http://www.m3lab.org>
Twitter: www.twitter.com/pratim

AREAS OF INTEREST

Complex Systems; Critical Phenomenology; Social Justice; Science Education; STEM Education; Programming Languages; Public Education

EMPLOYMENT

Professor, Learning Sciences & STEM Education (July 2019 – ongoing)
Research Chair in STEM Education
University of Calgary – Werklund School of Education, Canada

Associate Professor & Research Chair in STEM Education (Until June, 2019)
Educational Studies in Learning Sciences
University of Calgary – Werklund School of Education, Canada

Assistant Professor (Aug. 2009 – Aug. 2015)
Chair, Learning Sciences Program (2014 – 2015)
Department of Teaching and Learning
Vanderbilt University – Peabody College, USA

ACADEMIC PREPARATION

2004 - 2009 Ph.D, Learning Sciences
Northwestern University, USA

Dissertation: Designing Across Ages: Learning Electricity with Multi-Agent Based Computational Models

Dissertation committee: Uri Wilensky (chair), Andrew Ortony, and Bruce Sherin

2000 – 2004 M.S, Physics (2002)

PhD Candidate (2002 - 2004)

Northwestern University, USA

Dissertation Research: NMR investigation of High-Tc Superconductors

1998 – 2000 Integrated M.Sc (4th and 5th Years), Solid State Physics

Indian Institute of Technology (IIT), Kharagpur, India

1995 – 1998 B.Sc (Honours), Physics

Minors: Math, Chemistry

Presidency College, Calcutta, India

HONORS

1. Fellow, International Society for Design and Development in Education (ISDDE), 2019
2. Paul D. Fleck Award, April - May 2019, Banff Center for Arts and Creativity, Canada
3. Visiting Professorship, Feb – Mar 2019, Homi Bhabha Center for Science Education, TIFR, Mumbai, India
4. Recognized as a “Trailblazer” Researcher in STEM Education by Ingenium - Innovation 150 (a Canada-wide partnership with the Perimeter Institute, Actua, the Canadian Association of Science Centers and the Institute for Quantum Computing), Oct 2017
<https://ingeniumcanada.org/innovation/collection/trailblazers>
5. Research Chair of STEM Education, University of Calgary, Sep 2015 - present
6. NSF Early CAREER Award, 2012 – 2017, US National Science Foundation
7. Best paper awards and selections in conferences
 - a. International Conference of STEM in Education (2016 – Best Paper)
 - b. International Conference of Computers in Education 2016 – Best Paper selection (Top two papers)
 - c. International Conference of Computers in Education 2013 – Best Student Paper award for PhD student Satabdi Basu
 - d. CSEDU 2014 – One of the papers selected for publication in a Springer Book Series titled “Best Papers of CSEDU 2014”
 - e. CSEDU 2016 – Best Paper Nomination
 - f. Interaction, Design and Children (IDC) 2013 – Selected as one of the best three papers
 - g. Northwestern Institute for Complex Systems (NICO) Best Poster Award, 2008.
8. Nominated by Vanderbilt University for Ralph E. Powe Junior Faculty Enhancement Awards, 2010.
9. Northwestern Institute for Complex Systems (NICO) Best Poster Award, 2008
10. Northwestern University Dissertation Year Fellowship, 2008-2009.
11. Center for the Curricular Materials in Sciences (CCMS) Fellowship, 2005 – 2008
12. Materials Research Center Fellowship, Northwestern University, 2001 – 2004
13. Graduate Travel Award, Northwestern University, 2008, 2007, 2006, 2005
14. Departmental Fellowship, Department of Physics, Northwestern University, 2000 – 2002
15. K.L. Chopra Award for “Best Final Year Research Project” (all Science departments), IIT Kharagpur, 2000.
16. Departmental proficiency Award, “Best Final Year Research Thesis” (Physics), IIT Kharagpur, 2000.

INVITED TALKS & KEYNOTES

1. Sengupta, P. (Sep, 2019). Computation & Complexity in Public Education: A Critical Phenomenology. Opening Keynote, Learning Sciences Graduate Students Conference, 2019, Northwestern University, USA.
2. Sengupta, P. (Feb, 2019). Knowing and Being with Computational Agents. ASET Colloquium, Tata Institute for Fundamental Research, Mumbai, India.

3. Sengupta, P. (Mar, 2019). Making Complexity Critical. Invited Colloquium, IIT Bombay, India.
4. Sengupta, P. (Mar, 2019). Centering Margins in Agent-Based Modeling. Invited Colloquium, Tata Institute for Social Sciences (TISS), Mumbai, India.
5. Sengupta, P. (Feb, 2019). Design-Based Research as Critical Phenomenology. Invited Colloquium, Homi Bhabha Center for Science Education (HBCSE) – Tata Institute for Fundamental Research, India.
6. Sengupta, P., & Hladik, S. (September, 2018). Making Complexity Public. Invited Public Lecture at Telus SPARK Science Center, Inspiration Stage, Adults Only Night, September 13, 2018.
7. Sengupta, P. (Feb – March, 2019 – Tentative dates). Invited Visiting Scholar Lecture Series on Epistemology, Technology and Public Education. Tata Institute of Fundamental Research, Homi Bhabha Center for Science Education, Mumbai, India.
8. Sengupta, P. (June, 2018). The Art of Making Science and Technology Public Experiences. Commencement Address: Bahcesehir University, STEM Education Program, Istanbul, Turkey. (postponed due to Turkish National Elections).
9. Sengupta, P. (June, 2018). Multi-Agent Simulations in the Social Studies Classrooms. Invited talk, Alberta Teachers' Association – Social Studies Council.
10. Sengupta, P. (May, 2018). Design Reflections on *The Integral* (Movie). Invited public talk, Design Talks (d.talks), Calgary Public Library.
11. Sengupta, P. (March, 2018). Toward a Phenomenology of Computing in STEM. Invited colloquium, Northwestern University, USA.
12. Sengupta, P. (February, 2018). Beyond Silence and Certainty: Computation as Experience. Invited colloquium, Concord Consortium, USA (San Francisco & Boston).
13. Sengupta, P. (April, 2017). Constructing with mathematics. Invited public lecture, Math Nights (Organized by Dr. Jo Towers and Dr. Brent Davis), University of Calgary, Werklund School of Education, Canada.
14. Sengupta, P., Shanahan, M.-C., & Kim, B. (September, 2017). Play, Code & Science. Invited public lecture, Alumni Weekend, University of Calgary, Canada.
15. Sengupta, P. (January, 2017). Public computation. Invited talk, Vanderbilt University – Peabody College, USA.
16. Sengupta, P. (September, 2016). Open source, open minds. Invited public lecture, University of Calgary, Canada, Alumni Weekend.
17. Sengupta, P. (February, 2015). Developing Computation as Practice in K12 Classrooms. Invited presentation. Metro Nashville School Board, Nashville TN.
18. Sengupta, P. (May, 2014). Agent-based models and learning complexity. Guest lecture via Skype at University of Colorado, Boulder, USA, Learning Sciences PhD program.
19. Sengupta, P. (May, 2014). Developing Computation as Practice in K12 Classrooms. Invited keynote. Cyberlearning Summit 2014, Madison, Wisconsin.
20. Sengupta, P. (September, 2014). Agent-based Computation and Children's Science. Invited Colloquium, Physics Department, University of Memphis, Tennessee.
21. Sengupta, P. & Hoyle, D. (Oct, 2014). Each and Every Thing: "Open Time", Character Composition and Development. Heyman Center for the Humanities. Columbia University, New York, USA.
22. Sengupta, P. (October, 2013). Computation in K16: Challenges & Opportunities. External reviewer & Keynote speaker for the annual review of the undergraduate program in Computation and Information Technologies, Miami University, Ohio, USA.
23. Sengupta, P., Winger-Bearskin, A., Brady, C. & Woolard, C. (June, 2013). The Exchange Archive: Curating Exchange-based Art Online. Museum of Modern Art (MoMA), NYC, New York, USA.
24. Sengupta, P., & Winger-Bearskin, A. (May, 2012). What is Data? Queens Museum of Art, Brooklyn, NYC, New York, USA.

LEADERSHIP IN THE FIELD

1. Executive Editor, *Cognition and Instruction*, June 2018 - ongoing.
2. Senior Editor (STEM Education), Oxford Research Encyclopedia of Education, Feb 2019 – ongoing.

3. Member, Advisory Board, Bahcesehir University, STEM Education Program, Istanbul, Turkey (Nov 2018 – ongoing)
4. Member, Editorial Board, *Educational Design Research Journal*, June 2016 – ongoing (University of Hamburg, Germany)
5. Conference Chair, *International Conference of Computers in Education – Subconference C2 - CACL and Learning Sciences (ICCE 2017 – C2)*, 2017, New Zealand
6. Conference Chair, *STEM as Critical Literacies*, The First Symposium of the International Society for STEM in Education, Sep 2017, Banff, Alberta, Canada
7. Conference Co-Chair, *International Conference of Computers in Education – Subconference C2 - CACL and Learning Sciences (ICCE 2016 – C2)*, 2016, Mumbai, India
8. Member, Executive Committee, *International Conference for STEM in Education*, 2018, QUT, Brisbane, Australia
9. Member, Executive Committee, *International Society for STEM in Education*
10. Tenure & Promotion Reviews
 - a. University of Washington, USA
 - b. Miami University, Department of Computer and Information Technology, USA
 - c. American University of Beirut, Lebanon
 - d. Tata Institute of Fundamental Research, India
 - e. Boston University, USA
11. External Examiner, PhD Examination, Homi Bhabha Center for Science Education (Tata Institute of Fundamental Research), Mumbai, India
12. External Examiner, PhD Examination, Indian Institute of Technology, Mumbai, India
13. External Reviewer: US National Science Foundation Panel, STEM + C Program, 2018; SSHRC Insight Panel, 2017; Israeli Science Foundation, 2018
14. Panelist, National Science Foundation (CAREER, OCI, REESE, FIRE, ITEST, Cyberlearning); Total: 8 adjudication panels (2010 – 2015)
15. Member, Planning committee, Annual Conference of Artificial Intelligence in Education, 2011, 2012
16. Journal Reviewer (2009 – current), *Journal of the Learning Sciences*, *Educational Researcher*, *Journal of Research in Science Teaching*, *Instructional Science*, *Cognition & Instruction*, *Science Education*, *Research in Science Education*, *IEEE Transactions in Learning Technologies*, *British Journal of Educational Technology*, *Systems Dynamics Review*, *Journal of Educational Technology and Society*
17. NSF Advisory Boards: Currently serving on the editorial boards for three funded NSF projects.

COMMISSIONED MUSEUM AND PUBLIC INSTALLATIONS

1. FLOCKING SOUNDS, 2019 (Permanent Installation at **Studio Bell, Canada's National Music Center**). This is a commissioned installation in which visitors can create and compose sounds and music to interact with and manipulate flocking algorithms and visualizations. This is a public exhibit designed to integrate computational literacy with music education. Co-Designed with John Craig, Dylan Paré, Marie-Claire Shanahan, and other members of the Mind, Matter & Media Lab. Funding from Paul D. Fleck Award (Banff Center for Arts and Creativity) is gratefully acknowledged.
2. "FLOCKING STORIES", 2019 (Open Studio Installation at the **Banff Center for Arts and Creativity**, Banff, Alberta, Canada; April 26, 2019). As part of my Paul D. Fleck residency, along with Dr. Marie-Claire Shanahan and Dylan Pare' and other members of my research lab (m3lab.org), we designed an immersive, open source simulation that integrates LGBTQ narratives, storytelling, live musical performance and coding as a public experience for interacting with computational science.
3. "HACK THE FLOCK", 2018 (Permanent Installation at **TELUS Spark Science Museum**, Calgary, Jan 2018 - current): TELUS Spark Science Center in Calgary commissioned me to design and develop a permanent installation for public engagement with creating and modifying scientific simulations of complex systems using open source programming languages. This is the first exhibit in any science museum that allows visitors to "hack" a scientific simulation using original source code used by the scientists to create the simulation. The exhibit involves both hacking using physical controls (e.g., steering wheels) and text-based coding.

4. “VOICE YOUR CELEBRATION”, 2018: Canada Day Installation at **Studio Bell, National Music Center of Canada**, Calgary. (July 1, 2018). This is an invited installation, where the Studio Bell / NMC authorities asked me to design an immersive exhibit based on Hack The Flock that would also incorporate sounds. Visitors can record their voices and compose music using a virtual synthesizer to create their own versions of *O’ Canada*. Each composition then becomes the “song” for a new Boid that is created by the visitor. The Boids play their songs on loop in a “silent disco” mode and react to the other Boids using the Reynold’s flocking algorithm as well as the pitch of its “song” to optimize parameters of the algorithm. Co-designed with Peter Mattingly, Jordan Kidney, Stephanie Hladik and Weston Sandberg.
5. “AVALANCHING SANDPILES”, 2018: Featured installation, September 13, Adults Only Night, at the **Telus SPARK Science Center**. This is an invited installation, where we showcased open source, open science simulations of sand dune formation (a classic problem in statistical physics) for public engagement with the code and the simulations. Design led by my PhD student Stephanie Hladik.
6. “COMPLEX WORLDS, OPEN MINDS”, 2018: **BeakerHead Campus Collisions** Installation at the University of Calgary, Sep 19 – 20, 2018. This is an immersive exhibit that includes open source simulations of complex systems, a Virtual Reality immersive experience of queer and trans narratives, and 3D Sculpting in Virtual Reality. Co-designed with my PhD students Dylan Pare’, Stephanie Hladik and Jordan Kidney.
7. “DIGIPLAY”, 2016 (https://www.youtube.com/watch?v=4VNoYr_OeEI): It is a public participatory space where anyone can play, modify and create complex simulations and visualizations. Total funding: 150K CAD, commissioned by and installed at the **University of Calgary – Werklund School of Education**. Funding from Imperial Oil Foundation is gratefully acknowledged.
8. “EXCHANGE ARCHIVE”, 2013 (www.theexchangearchive.com): The Exchange Archive is an online, crowdsourced, network visualization and research database for artists who work in the area of social practice, and for art projects about exchange. This project was commissioned by the **Museum of Modern Art (MoMA), NYC, New York**. It was installed at MoMA’s Cullman Research Center, as part of the exhibition “Artists Experiment: Exchange Studio”, which was open to the public from June 30 – July 30, 2014. This was a collaboration with artists and technologists (Caroline Woolard, Amelia Winger-Bearskin, Corey Brady and Mason Wright). My lab was in charge of developing and implementing the software.

OTHER CREATIVE PROJECTS

1. “**STEM Radio Hour**” **Podcast Series**, 2016 – Ongoing: Research based podcast series that examines the boundaries of STEM and STEM Education. Created and directed by Pratim Sengupta, Marie-Claire Shanahan and Beaumie Kim in collaboration with Molly Segal (Journalist, CBC Radio). Available on iTunes and Google Play (Keyword: “STEM Radio Hour”). Episodes co-produced by Werklund B.Ed and PhD students.

RESEARCH GRANTS

1. External (Awarded)

- a. *Disability, Augmentative and Alternative Communication (AAC) and Science Education*. Social Sciences and Humanities Research Council, Canada. Marie-Claire Shanahan (PI), **Pratim Sengupta (Co-PI)**. Duration: 2019 – 2021, **Award amount: \$57,790.00 (CAD)**
- b. *STEM + C + Society: A Research-Practitioner Partnership for Designing Inquiry Activities*. NSF STEM + C Program. Ayush Gupta (PI), Andy Elby (Co-PI), **Pratim Sengupta (Co-PI)**. Duration: 10/1/2018-7/31/2021. **UCalgary Sub-Award amount: \$ 242,000.00 (CAD)**
- c. *Enabling Modeling and Simulation-Based Science in the Classroom: Integrating agent-based models, real world sensing and collaborative networks*. NSF (Program: DRK12).

Duration: Jun 2010 – Jun 2014. Subcontract from Northwestern University. **Vanderbilt PI: Pratim Sengupta. Subcontract Amount: \$ 260K (USD)**; Total award amount: \$ 2.74M.

- d. *CTSiM: Fostering Computational Thinking in Middle Schools through Scientific Modeling & Simulation*. NSF Cyberlearning. Gautam Biswas (PI), **Pratim Sengupta (Co-PI)**, Douglas Clark (Co-PI). Duration: 2 years 8/1/2011-7/31/2013. **Amount: \$550K (USD)**
- e. *Enhancing Games with Assessment and Metacognitive Emphases (EGAME)*. Doug Clark (PI), **Pratim Sengupta (Co-PI)**, Gautam Biswas (Co-PI). NSF (Program: DRK12). **Amount: \$3.5M (USD)**
- f. *CoRe-Sci: Computational Reconstruction of K12 Curricular Science (NSF CAREER)*. **PI: Pratim Sengupta. Amount: \$754,000.00. (USD)** Office of Cyberinfrastructure / Office of the Director. 4/1/2012-3/31/2017.
- g. *Extending CTSiM: An Adaptive Computational Thinking Environment for Learning Science through Modeling and Simulation in Middle School Classrooms*. NSF Cyberlearning. Gautam Biswas (PI), **Pratim Sengupta (Co-PI)**, Douglas Clark (Co-PI). Duration: 2 years 8/1/2014-7/31/2017. **Amount: \$1.35M. (USD)**

2. External (In Preparation)

Title: Making STEM Public. SSHRC Insight Grant Proposal. Pratim Sengupta (PI), Marie-Claire Shanahan (Co-I), Amount: CAD 150K. Expected date of submission: Oct, 2019

3. Internal (UCalgary)

- a. *NIC-STEM: Narratives, Identity and Computing in STEM*. **PI: Pratim Sengupta**, Co-PIs: Marie-Claire Shanahan & Beaumie Kim. *Funding agency: Taylor Family Institute for Teaching, University of Calgary*. June 2016 – June 2018. **Amount: 40K (CAD)**
- b. Eyes High Doctoral Recruitment Award. **PI: Pratim Sengupta** Sep 2016 – Aug 2021. **Amount: 150K (CAD)**.

4. Internal (Vanderbilt)

- a. *NetsBlox: A visual programming environment for K-12 computer networking education*. Awarded Aug 2015. **Pratim Sengupta (Co-PI)**, Akos Ledeksi (PI). **Amount: 100K**.
- b. *Developing An Online Models Repository*. Instructional Development Grant (Peabody small grant). Awarded Nov 2010. **PI: Pratim Sengupta. Amount: \$7K**.
- c. *Participatory Simulations in Physics*. Peabody Small Grant (Awarded: Nov, 2009). Duration: Dec 2009 – Dec 2010. **PI: Pratim Sengupta. Amount: \$10K**.

REFEREED PUBLICATIONS

NOTE 1: Authors marked with ** indicate graduate students and post-docs.

NOTE 2: Authors marked with ^^ indicate equal co-authors

NOTE 3: Authors marked with #C indicate author for correspondence

[A] Books and Edited Volumes

Books

1. Sengupta, P., Dicks, A.**, & Farris, A. V.** (In Press by Oct 2019). *Voicing Code in the STEM Classroom*. MIT Press: Cambridge, MA.

Edited Volumes

2. Sengupta, P., Shanahan, M.-C., & Kim, B. (In Press). *Critical, Transdisciplinary and Embodied Approaches for STEM Education*. Springer: New York, NY.

[B] Journal Articles (Published / In Press / Accepted)

1. Farris, A.V.**, Dickes, A.C.**, & Sengupta, P. (2019). Learning to Interpret Measurement and Motion in Fourth Grade Computational Modeling. *Science & Education*. <https://doi.org/10.1007/s11191-019-00069-7>
2. Dickes, A.**, Farris, A.**, & Sengupta, P. (In Press). Sociomathematical Norms for Integrating Programming and Computational Modeling with Elementary Science. *Journal of Science, Education and Technology*.
3. Krinks, K. D.**, Sengupta, P., & Clark, D. B. (2019). Modeling Games in the K-12 Science Classroom. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS)*, 11(1), 31-50. doi:10.4018/IJGCMS.2019010103
4. Clark, D.^, & Sengupta, P.^ (2019). Reconceptualizing Games for Integrating Computational Thinking and Science as Practice: Collaborative Agent-Based Disciplinarily-Integrated Games. *Interactive Learning Environments*. *[Equal co-authors]*
5. Van Eaton, G.**, Clark, D., & Sengupta, P. (2018). Revoicing, Bridging, and Stuttering Across Formal, Physical, and Virtual Spaces. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS)*, 10(2), 21-46.
6. Hostetler, A.^, Sengupta, P.^, & Hollett, T. (2018). Unsilencing Critical Conversations in Social-Studies Teacher Education using Agent-based Modeling. *Cognition & Instruction*, 36(2), 139 – 170. *[Hostetler and Sengupta are equal co-authors, and are listed alphabetically]*
7. Sengupta, P., Brown, B., Rushton, K., Shanahan, M. C. (2018). Reframing coding as “Mathematization” in the K-12 classroom: Views from teacher professional learning. *Alberta Science Education Journal*, 45(2), 28 - 36.
8. Virk, S. S.**, Clark, D. B., & Sengupta, P. (2017). The Design of Disciplinarily-Integrated Games as Multi-representational Systems. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS)*, 9(3), 67-95.
9. Sengupta, P. & Shanahan, M.-C. (2017). Boundary Play and Pivots in Public Computation: New Directions in Integrated STEM Education. *International Journal of Engineering Education*, 33 (3), pp. 1124–1134.
10. Kinnebrew, J. S.**, Killingsworth, S. S.**, Clark, D. B., Biswas, G., Sengupta, P., Minstrell, J., & Krinks, K. (2017). Contextual Markup and Mining in Digital Games for Science Learning: Connecting Player Behaviors to Learning Goals. *IEEE Transactions on Learning Technologies*, 10(1), 93-103.
11. Basu, S.**, Biswas, G., Sengupta, P., Dickes, A.**, Kinnebrew, J. S.**, & Clark, D. (2016). Identifying middle school students’ challenges in computational thinking-based science learning. *Research and Practice in Technology Enhanced Learning*, 11(1), 1-35.
12. Dickes, A.**, Sengupta, P. #C, Farris, A.V.**, & Basu, S.** (2016). Development of Mechanistic Reasoning and Multi-level Explanations in 3rd Grade Biology Using Multi-Agent Based Models. *Science Education*, 100(4), 734–776.
13. Sengupta, P. #C, Krinks, K.**, & Clark, D. B. (2015). Learning to Deflect: Conceptual Change in Physics through Use of Digital Games. *Journal of the Learning Sciences*, 24 (2), 638 – 674.
14. Virk, S.**, Clark, D., & Sengupta, P. (2015). Digital Games as Multirepresentational Environments for Science Learning: Implications for Theory, Research, and Design. *Educational Psychologist*, 50 (4), 284 – 312.
15. Sengupta, P. #C, Dickes, A.C.**, Farris, A.V.**, Karan, A.**, & Martin, D.** (2015). Programming in K12 classrooms. *Communications of the ACM*, 58(11), 33-35.
16. Sengupta, P. #C, Krishnan, G.**, Wright, M.**, & Ghassoul, C. (2015). Mathematical Machines & Integrated STEM: An Intersubjective Constructionist Approach. *Communications in Computer and Information Science*, Vol. 510, 272-288.
17. Farris, A.V.**, & Sengupta, P. #C (2016). Democratizing Children’s Computation: Learning Computational Science as Aesthetic Experience. *Educational Theory*, 66 (1-2), 279–296.
18. Clark, D. B., Virk, S.**, Sengupta, P., Brady, C., Martinez-Garza, M.**, Krinks, K.**, Killingsworth, S.**, Kinnebrew, J.**, Biswas, G., Barnes, J.**, Minstrell, J., Nelson, B., Slack, K.**, & D’Angelo,

- C**. (2016). SURGE's evolution deeper into formal representations: The siren's call of popular game-play mechanics. *International Journal of Designs for Learning*, 7(1), 107-146.
19. Sengupta, P. #C, & Clark, D. B. (2016). Playing Modeling Games in the Science Classroom: The Case for Disciplinary Integration. *Educational Technology*, 56 (3), 16 – 22.
 20. Clark, D. B.,^ Sengupta, P.,^ Brady, C., Martinez-Garza, M., & Killingsworth, S. (2015). Disciplinary Integration in Digital Games for Science Learning. *International Journal of STEM Education*, 3(2), 1 – 21.
 21. Wright, M.,** & Sengupta, P. #C (2015). Modeling Oligarchs' Campaign Donations and Ideological Preferences with Simulated Agent-Based Spatial Elections. *Journal of Artificial Societies and Social Simulations*, 18(2), 3.
 22. Basu, S.**, Sengupta, P., & Biswas, G. (2015). A scaffolding framework to support learning of emergent phenomena using multi-agent based simulation environments. *Research in Science Education*, Volume 45 (2), 293-324.
 23. Sengupta, P. #C, Kinnebrew, J.**, Basu, S.**, Biswas, G., and Clark, D. (2013). Integrating Computational Thinking with K12 Science Education Using Agent-Based Computation: A Theoretical Framework. *Education & Information Technologies*, 18(2), 351-380.
 24. Dickes, A.**, & Sengupta, P. #C (2013). Learning Natural Selection in 4th Grade With Agent-Based Models. *Research in Science Education*. 43(3), 921-953.
 25. Sengupta, P. #C, Voss Farris, A.**, & Wright, M**. (2012). From Agents to Aggregation via Aesthetics: Learning Mechanics with Visual Agent-based Computational Modeling. *Technology, Knowledge & Learning* Vol. 17 (1-2), pp. 23 – 42.
 26. Sengupta, P. #C, & Wilensky, U. (2009). Learning electricity with NIELS: Thinking with electrons and thinking in levels. *International Journal of Computers for Mathematical Learning*, 14(1), 21-50.
 27. Chen, B., Sengupta, P., Halperin, W. P., Sigmund, E. E., Mitrović, V. F., Lee, M. H., & Cho, B. K. (2006). Anisotropy and penetration depth of MgB2 from 11B NMR. *New Journal of Physics*, 8(11), 274.
 28. Sen, D., Mazumder, S., Sengupta, P., Ghosh, A., & Ramachandhran, V. (2000). Small-Angle X-Ray Scattering Study of Porous Polysulfone and Poly (Vinyl Pyrrolidone) / Polysulfone Blend Membranes. *Journal of Macromolecular Science, Part B: Physics*. Vol. 39 (2), pp 235-243.

[C] Book Chapters (Published / Accepted)

1. Davis, B., & Sengupta, P. (2018). Complexity in Mathematics Education. In: Lerman, S. (Ed), *Encyclopedia of Mathematics Education (2nd Edition)*. Springer: New York.
2. Sengupta, P., Dickes, A., & Farris, A.V. (2018). Toward a Phenomenology of Computational Thinking in STEM. In: Khine, M.S. (Ed.): *Computational Thinking in STEM: Research Highlights.*, pp 49 – 72. Springer: New York.
3. Sengupta, P., Shanahan, M.-C., & Kim, B. (Accepted). Transdisciplinarity, Embodiment and Critical Perspectives: A Framework for Critical STEM Literacies. In: Sengupta, P., Shanahan, M.-C., & Kim, B. (Eds.) *Critical, Transdisciplinary and Embodied Approaches for STEM Education*. Springer: New York, NY.
4. Clark, D. B., Sengupta, P., & Virk, S.** (2016). Disciplinarily-Integrated Games: Generalizing Across Domains and Model Types. In: *Russell, D., & Laffey, J. (Eds). Handbook of research on gaming trends in P-12 education*. Hershey, PA: IGI Global. DOI: 10.4018/978-1-4666-9629-7.
5. Clark, D. B., & Sengupta, P. (2013). Argumentation and modeling: Integrating the products and practices of science to improve science education. In M. Khine & I. Saleh (Eds.), *Approaches and Strategies in Next Generation Science Learning* (pp. 85-105). Hershey, PA: IGI Global/Information Science References. DOI:10.4018/978-1-4666-2809-0.ch005.
6. Rapp, D.N., & Sengupta, P. (2012). Models and modeling in science learning. *Encyclopedia of the Sciences of Learning*. 2320-2322. Springer, New York, NY.
7. Sengupta, P., & Wilensky, U. (2011). Lowering the Learning Threshold: Multi-Agent-Based Models and Learning Electricity. To appear in Khine, M.S., & Saleh, I.M (Eds.). *Dynamic Modeling: Cognitive Tool for Scientific Inquiry*. Springer, New York, NY.

[D] Commissioned Papers

1. Sengupta, P., & Shanahan, M.C. (2017). *Open Science, Public Engagement and the University*. Paper commissioned by the NSF-NIH conference on Imagining Tomorrow's Universities, Chicago, IL. DOI: [arXiv:1702.04855](https://arxiv.org/abs/1702.04855)
2. Clark, D. B., Nelson, B., Sengupta, P., D'Angelo, C. M. (2009). *Rethinking Science Learning Through Digital Games and Simulations: Genres, Examples, and Evidence*. Invited Topic Paper in the Proceedings of The National Academies Board on Science Education Workshop on Learning Science: Computer Games, Simulations, and Education. Washington, D.C.

[E] Published Conference Proceedings in STEM Education, Computer Science & Learning Sciences Conferences [Full Papers]

1. Paré, D., & Sengupta, P. (2018). *Queering Virtual Reality*. In: Proceedings of the Fifth International Conference of STEM in Education, Brisbane, Australia.
2. Lam-Herrera, M., Xenacoje Community & Sengupta, P. (2018). *Decolonizing Complexity Education: Preliminary Perspectives*. In: Proceedings of the Fifth International Conference of STEM in Education, Brisbane, Australia.
3. Hladik, S., Kidney, J. & Sengupta, P. (2018). *Pivots, Professional Vision, and Reflective Design in Public Computing*. In: Proceedings of the Fifth International Conference of STEM in Education, Brisbane, Australia.
4. Sengupta, P., & Shanahan, M.-C. (2016). STEM as Public Computation and Boundary Play. In: *Proceedings of the STEM 2016 Conference*, Beijing, China.
5. Sengupta, P., & Wilensky, U. (2016). Understanding Electric Current Using Agent-Based Models: Connecting the Micro-level with Flow Rate. In: *Proceedings of the 8th International Conference on Computer Supported Education (CSEDU 2016)*, pp 216-227.
6. Farris, A.V., Dickes, A.C., & Sengupta, P. (2016). Development of Disciplined Interpretation Using Computational Modeling in the Elementary Science Classroom. In: *Proceedings of the 12th International Conference of the Learning Sciences (ICLS 2016)*, pp 282 – 289.
7. Dickes, A.C., Farris, A.V., & Sengupta, P. (2016). Integrating Agent-based Programming with Elementary Science: The Role of Socio-Mathematical Norms. In: *Proceedings of the 12th International Conference of Computers in Education (ICCE 2016)*. [Selected as one of two candidates for Best Paper Award].
8. Sengupta, P., Krishnan, G., & Wright, M. (2014). *Integrated STEM in Elementary Grades Using Distributed Agent-based Computation*. In Proceedings of the 6th International Conference on Computer Supported Education (pp. 67 - 78). [Acceptance rate: 12%; This paper was selected as one of the best papers of the conference, and a revised version was invited for publication in Communications of Computing and Information Sciences]
9. Basu, S.**, Dickes, A.**, Kinnebrew, J.S.**, Sengupta, P., & Biswas, G. (2013). *CTSiM: A Computational Thinking Environment for Learning Science through Simulation and Modeling*. In Proceedings of the 5th International Conference on Computer Supported Education (pp. 369-378).
10. Clark, D. B., Killingsworth, S.**, Martinez-Garza, M.**, Van Eaton, G.**, Biswas, G., Kinnebrew, J., Sengupta, P., Krinks, K.**, Adams, D.** Zhang, H., & Hughes, J.** (2013). Digital Games and Science Learning: Design Principles and Processes to Augment Commercial Game Design Conventions. Full Workshop Paper for the 16th International Conference on *Artificial Intelligence in Education (AIED 2013)*. Memphis, TN.
11. Sengupta, P., & Farris, A.V.** (2012). *Learning Kinematics in Elementary Grades Using Agent-based Computational Modeling: A Visual Programming Based Approach*. In: Proceedings of the 11th International Conference on Interaction Design & Children, pp 78 – 87. ACM. [Acceptance rate: 28%] [This paper was selected as one of the best papers of the conference, and a revised version was invited for publication in International Journal of Child Computer Interaction. I declined the invitation upon advice of senior colleagues at Vanderbilt.]
12. Basu, S., Kinnebrew, J., Dickes, A., Farris, A.V., Sengupta, P., Winger, J., & Biswas, G. (2012). A Science Learning Environment using a Computational Thinking Approach. In *Proceedings of the 20th International Conference on Computers in Education* (pp. 722-729). Singapore. [This paper

won the Best Student Paper Award]

13. Sengupta, P., Kinnebrew, J., Biswas, G., and Clark, D. (2012). Integrating Computational Thinking with K12 Science Education: A Theoretical Framework. In: Proceedings of the 4th International Conference on Computer Supported Education, *Proceedings of the 4th International Conference on Computer Supported Education*, Vol 2, pp 40 - 49. [Acceptance rate: 13%] [This paper was selected as one of the best papers of the conference, and a revised version was invited for publication in journal Education and Information Technologies]
14. Sengupta, P., & Wilensky, U. (2005). *N.I.E.L.S: An emergent multi-agent based modeling environment for learning physics*. Paper presented at the 4th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 2005), Utrecht, Netherlands.

[F] Published Conference Proceedings in Computer Science & Learning Sciences Conferences [Short Papers, 3- 5 pages]

1. Basu, S., Dukeman, A., Kinnebrew, J., Biswas, G., & Sengupta, P. (2014). Investigating student generated computational models of science. In: *Proceedings of the 11th International Conference of the Learning Sciences (pp. 1097-1101)*. Boulder, CO, USA.
2. Farris, A.V., & Sengupta, P. (2014). Perspectival Computational Thinking for Learning Physics: A Case Study of Collaborative Agent-based Modeling. *Proceedings of the 12th International Conference of the Learning Sciences*. (ICLS 2014), pp 1102 - 1107.
3. Farris, A.V., & Sengupta, P. (2013). On the aesthetics of children's computational modeling for learning science. *ACM Proceedings of the 12th International Conference on Interaction Design and Children (IDC 2013)*, pp 479 – 482.
4. Basu, S., Biswas, G., & Sengupta, P. (2011). Scaffolding to Support Learning of Ecology in Simulation Environments. In: Biswas, G., & Bull, S. (Eds.). *Lecture Notes in Computer Science*, AIED 2011 (Vol. 6738/2011, pp. 417-419).

[G] Published Conference Proceedings in Computer Science & Learning Sciences Conferences [Shorter Papers ~ 2 pages]

1. Krishnan, G. & Sengupta, P. (2014). Tangible Agent-based Computation for Learning Physics. *Proceedings of International conference of the Learning Sciences 2014*, pp 1547 - 1549.
2. Sengupta, P. (2011). Design Principles for a Visual Programming Language to Integrate Agent-based modeling in K-12 Science. In: *Proceedings of the Eighth International Conference of Complex Systems (ICCS 2011)*, pp 1636 - 1637.
3. Wilkerson, M., Sengupta, P., Wilensky, U. (2008). *Perceptual Supports for Sensemaking: A Case Study Using Multi Agent Based Computational Learning Environments*. *Proceedings of the Eighth International Conference for the Learning Sciences (ICLS 2008)*, Vol. 3, pp 151 – 153.
4. Sengupta, P., & Wilensky, U. (2008). On Learning Electricity in 7th Grade with Multi-agent Based Computational Models (NIELS). *Proceedings of the Eighth International Conference for the Learning Sciences (ICLS 2008)*, Vol. 3, pp 123 – 125. The Netherlands: ISLS.

[H] Published Conference Proceedings in Computer Science & Learning Sciences Conferences [Symposium presentations]

1. Sengupta, P., Shanahan, M.-C., Hladik, S., & Pare', D. (2018). Public Coding as Boundary Work. In: O'Connor, K., & Rahm, J. (Organizers). Unpacking 'signs of learning' in complex social environments: Desettling neoliberal market-driven educational methodologies, epistemologies and recognitions of learning. In: *Proceedings of the Thirteenth International Conference for the Learning Sciences (ICLS 2018)*, London, UK.
2. Sengupta, P. (2010). Intuitive Mechanisms, Agent-Based Models and Learning Physics. *Proceedings of the Ninth International Conference for the Learning Sciences (ICLS 2010)*.
3. Sengupta, P., & Wilensky, U. (2008). Learning Activities As Tools For Formative Assessment - Case Study Of A Computational Multi-Agent Based Electricity Curriculum (NIELS: NetLogo Investigations In Electromagnetism). In B. Zhang (Chair) and J. Gobert (Discussant), "Designing and Assessing Modeling and Visualization Technologies (MVT) Enhanced Learning". *Proceedings of the Eighth International Conference for the Learning Sciences (ICLS 2008)*, Vol. 3, pp 383 – 391. The Netherlands: ISLS.

4. Sengupta, P., & Wilensky, U. (2008). On The Learnability of Electricity As A Complex System. In M. Jacobson (Chair) and R. Noss (Discussant), "Complex Systems & Learning: Empirical Research, Issues & "Seeing" Scientific Knowledge With New Eyes." *Proceedings of the Eighth International Conference for the Learning Sciences (ICLS 2008)*, Vol. 3, pp 258 – 264. The Netherlands: ISLS.

[I] Papers, Symposia, Presentations and Workshops in Education Conferences (without proceedings)

1. Sengupta, P., Shanahan, M.-C. & Kim, B. (2018). Play, Code, Science and Radio: Rethinking STEM Teacher Education. Paper presented at Annual Conference of the Canadian Society for the Study of Education (CSEE 2018). University of Regina, Regina.
2. Sengupta, P., Shanahan, M.-C. & Kim, B. (2017). Rethinking STEM Teacher Education. *Paper presented at the First Symposium of the International Society for STEM in Education*, Banff, Canada.
3. Sengupta, P., Shanahan, M.-C., Beaulieu, D., & Sandberg, W. (2017). *Beyond Instrumental Clichés: Conceptual Art and the Aesthetics of Computing in Public*. Paper presented at Annual Conference of the Canadian Society for the Study of Education (CSEE 2017). Ryerson University, Toronto.
4. Sengupta, P. (2016). Aesthetic Development in Children's Long-Term Modelling. Paper presented at the Annual Conference of American Educational Research Association (AERA 2016). Washington, D.C.
5. Farris, A. V. & Sengupta, P. (2016). *Progressive symbolization and the long-term development of computational modelling in Fourth Grade Science*. Paper presented at the Annual Conference of American Educational Research Association (AERA 2015). Washington, D.C.
6. Farris, A. V. & Sengupta, P. (2015). *Children's computational manipulation of found images as a generative context for mathematics and computer science learning*. Poster presented at the Annual Conference of American Educational Research Association (AERA 2015). Chicago, IL.
7. Dickes, A. C.; Farris, A. V., Sengupta, P., Brutcher, E., & Ghassoul, C. (2015). Programming motion and ecology as mathematizing: A year-long developmental study. Paper presented the Annual Meeting of American Educational Research Association (AERA 2015). Chicago, IL.
8. Dickes, A.,** Sengupta, P., Krishnan, G.,** Farris, A.V.** (2014) Conceptual Change in Elementary Kinematics and Ecology through the Development of Representational Practices. Paper accepted for presentation at the Annual Conference of the American Educational Research Association.
9. Sengupta, P., Dickes, A.**, Ghassoul, C.**, and Krishnan, G.** (2014). Long-Term Development of Agent-Based Computational Modeling in 5th Grade. Paper accepted for presentation at the Annual Conference of the American Educational Research Association.
10. Krishnan, G.**, & Sengupta, P. (2014). Tangible Agent-Based Computation for Learning Physics. Paper accepted for presentation at the Annual Conference of the American Educational Research Association.
11. Dickes, A.,** Sengupta, P., Krishnan, G.,** Farris, A.V.** (2013) Integrating Agent Based Models with Elementary Grade Ecology Classrooms. Paper accepted for presentation at the Annual Conference of the American Educational Research Association. San Francisco, CA.
12. Dickes, A.,** Sengupta, P., Krishnan, G.** (2013) *Conceptual Change in Elementary Kinematics and Ecology through the Development of Agent-based Computational Representations*. Poster accepted for presentation at the Annual Conference of the National Association of Research on Science Teaching. Rio Grande, Puerto Rico.
13. Dickes, A.,** Sengupta, P., Krishnan, G.** (2013) *Thinking Like a Butterfly: Leveraging Students' Embodied Intuitions in Elementary Ecology Classrooms*. Poster accepted for presentation at the Annual Conference of the National Association of Research on Science Teaching. Rio Grande, Puerto Rico.
14. Krinks, K.**, Sengupta, P., Hughes, J**. M., & Martinez-Garza, M. M.** (2013). *Conceptual change in physics through use of digital games*. Paper presented at the National Association for Research in Science Teaching, Rio Grande, Puerto Rico.

15. Farris, A. V.**; Sengupta, P., and Krishnan, G.** (2013). An Integrated Approach for Learning Kinematics and Developing Computational Thinking in Elementary Grades. Paper accepted for presentation at the Annual Conference of National Association of Research on Science Teaching (NARST 2013), Rio Grande, Puerto Rico.
16. Sengupta, P., and Farris, A.V.** (2013). Beyond Computational Thinking: Resources for Development of Collaborative Perspectival Computer Programming and Modeling. Paper accepted for presentation at the Annual Conference of National Association of Research on Science Teaching (NARST 2013), Rio Grande, Puerto Rico.
17. Farris, A.V.** and Sengupta, P. (2013). Resources for Developing Perspectival Computational Thinking: An In-Depth Case Study of Collaborative Agent-Based Visual Programming. Paper accepted for presentation at the Annual Conference of American Educational Researchers Association (AERA 2013), San Francisco, CA.
18. Winger-Bearskin, A., & Sengupta, P. (2012). *Art of Hacking Toys: Portable Computation & Society*. Workshop organized for Open Engagement Conference 2012, Portland, Oregon: May 5 – 7.
19. Sengupta, P., & Winger-Bearskin, A. (2012). *Re-imagining Children's Computing As Performance Art: Theoretical and Empirical Explorations in Children's Learning of Physics via Aesthetic Computing*. Paper accepted for presentation at the Third International Conference of the Image, Poznań, Poland, Sep, 14-16.
20. Dickes, A., & Sengupta, P. (2011). Learning Natural Selection in 4th Grade With Multi-Agent-Based Computational Models. In Sengupta, P. (Chair), & Hall, R. (Discussant). *Models, Modeling, and Naïve Intuitive Knowledge in Science Learning*. Symposium presented at the 41st Annual Meeting of the Jean Piaget Society, Berkeley, CA.
21. Krinks, K **, & Sengupta, P. (2012) *Rethinking Expertise in Physics: An Investigation of Expertise in High School Physics Teachers*. Poster accepted for presentation at the AERA 2012.
22. Krishnan, G.**; Sengupta, P., Dickes, A.**; & Voss-Farris, A.** (2012). *On Learning Ecology In Elementary Grades By Designing Robotic Animals And Their Habitats*. Poster accepted for presentation at AERA 2012.
23. Krinks, K **, & Sengupta, P. (2012) *Rethinking Expertise in Physics: An Investigation of Expertise in High School Physics Teachers*. Paper accepted for presentation at the Annual Conference of National Association of Research on Science Teaching (NARST 2012), Indianapolis, IN.
24. Dickes, A.**; Sengupta, P., & Krishnan, G.** (2012). *Learning Ecology in a 3rd Grade Classroom Using Design-based Learning: An Embodied Modeling Approach*. Paper accepted for presentation at the Annual Conference of National Association of Research on Science Teaching (NARST 2012), Indianapolis, IN.
25. Krishnan, G.**; Sengupta, P., Dickes, A.**; & Voss-Farris, A.** (2012). *On Learning Ecology In Elementary Grades By Designing Robotic Animals And Their Habitats*. Paper accepted for presentation at the Annual Conference of National Association of Research on Science Teaching (NARST 2012), Indianapolis, IN.
26. Sengupta, P. (2011). *Models, Modeling, and Naïve Intuitive Knowledge in Science Learning*. Symposium organized at the 41st Annual Meeting of the Jean Piaget Society, Berkeley, CA.
27. Sengupta, P. (2011). *Learning Electromagnetism with ElectroHub - A Digital Game Based on Participatory Simulation*. In “Digital Games and Science Learning”, Clark, D. (Org.). Invited paper session at the Annual Conference of National Association of Research on Science Teaching (NARST 2011).
28. Sengupta, P. (2011). *Principles for Designing a Visual Programming Language to Integrate Agent-based modeling in K-12 Science*. Paper presented at SwarmFest 2011.
29. Sengupta, P. (2010). *Learning Electricity in Middle Grades with Agent-based Computer Models*. Poster Accepted for Presentation at the 2010 Annual Conference of International Society of Technology in Education (ISTE 2010). Denver, Co.
30. Sengupta, P. (2010). *On The Cognitive Implications of Designing A Multi-Agent Models-based Computational Learning Environment in Electricity (NIELS) Based on Intuitive, Agent-level Mechanisms*. Poster Accepted for Presentation at Annual Conference of National Association of Research on Science Teaching (NARST 2010), Philadelphia, PA.

31. Sengupta, P., & Wilensky, U. (2010). *Intuitive Mechanisms, Agent-Based Models and learning Physics*. Paper accepted for presentation at the 2010 Annual Conference of Games, Learning and Society. Madison, WI.
32. Sengupta, P., & Wilensky, U. (2008). *Designing Across Ages: On the Low-Threshold, High-Ceiling Nature of A Multi-agent Based Learning Environment in Electricity (NIELS)*. Paper presented at the annual meeting of the American Educational Research Association (AERA 2008), New York, NY.
33. Sengupta, P., & Thacker, R. (2008). *Bridging Design Research and Practice: Identifying High-Level Design Principles Through A Comparative Analysis of Design Frameworks Used in Educational and Professional Settings*. Paper presented at the second International Conference of Design Principles and Practice (Design Conference 2008), Miami, FL.
34. Sengupta, P., & Banerjee, P. (2009). *Leveraging informality to engender productive epistemological shifts: A Case Study*. Paper presented at the annual meeting of the American Educational Research Association (AERA 2009), San Diego, CA.
35. Sengupta, P., & Wilensky, U. (2009). *Agent-based Models and Learning Electricity*. Paper presented at the annual meeting of the American Educational Research Association (AERA 2009), New York, NY.
36. Sengupta, P., Wilkerson, M. & Wilensky, U. (2007). *On The Relationship Between Visuospatial Thinking And Learning Electricity: Comparative Case Studies of Students Using 2D And 3D Emergent, Computational Learning Environments*. Paper presented at the annual meeting of the American Educational Research Association (AERA 2007), Chicago, IL.
37. Sengupta, P., & Wilensky, U. (2007). *Learning electricity in 5th Grade with Multi-Agent Based Computational Models*. Paper presented at the 2007 Annual Knowledge Sharing Institute (KSI) of the Center For Curricular Materials in Sciences (CCMS). AAAS, Washington D.C.
38. Sengupta, P., & Wilensky, U. (2006). *NIELS: An agent-based modeling environment for learning electromagnetism*. Paper presented at the annual meeting of the American Educational Research Association (AERA 2006), San Francisco, CA.

ADVISING

PhD – Primary Advisees (Completed)

1. Kara Krinks (Science Education, Vanderbilt; Role – Primary Advisor; 2010-2016; Current position: Assistant Professor, Lipscomb University, USA)
2. Amanda Dickes (Learning Sciences, Vanderbilt; Role – Primary Advisor; 2010 – 2017; Current position: PostDoc, Harvard university, USA)
3. Amy Voss Farris (Learning Sciences, Vanderbilt; Role – Primary Advisor; 2011 – 2018; Current Position: Assistant Professor, The Pennsylvania State University, University Park, USA)

PhD – Supervisory Committee Member (Completed)

1. Astrid Kendrick (Leadership, University of Calgary - WSE; Role – Committee Member; EdD 2018);
2. Satabdi Basu (Computer Science, Vanderbilt; Role: Committee Member; PhD 2016; Current position: PostDoc, Stanford Research Institute (SRI), USA)
3. Nathan Phillip (Language, Literacy and Culture, Vanderbilt; Role – Committee Member; PhD 2014; Current position: Assistant Professor, University of Illinois at Chicago, USA)
4. Sandra Becker (Learning Sciences, UCalgary; Role – Supervisory Committee Member)

PhD – In progress

1. Marilu Lam Herrera (Learning Sciences, UCalgary; Role – Primary Advisor)
2. Dylan Paré (Learning Sciences, UCalgary; Role – Primary Advisor)
3. Stephanie Hladik (Learning Sciences, UCalgary; Role – Primary Advisor)
4. Basak Helvacı (Learning Sciences, UCalgary; Role – Primary Advisor)
5. Jordan Kidney (Learning Sciences, UCalgary; Role – Primary Advisor)
6. Apoorve Chokshi (Learning Sciences, UCalgary; Role – Primary Advisor)
7. Reyhaneh Bastani (Learning Sciences, UCalgary; Role – Supervisory Committee Member)
8. Alamr Hebbah (Learning Sciences, UCalgary; Role – Supervisory Committee Member)

EdD – In progress

1. Michael Cutler (Learning Sciences, UCalgary; Role – Primary Advisor)
2. Somi Lee (Learning Sciences, UCalgary; Role – Co-Advisor)
3. Yoni Porat (Learning Sciences, UCalgary; Role – Supervisory Committee Member)

Masters (Completed)

1. Wilson Hubbell (Learning & Instruction; Vanderbilt; Role: Masters thesis advisor) 2009 - 2011
2. Amanda Dickes (Learning and Instruction; Vanderbilt; Role: Masters thesis advisor) 2009 - 2010

Masters – Non-Degree

1. Mason Wright (Computer Science & Science Education; Vanderbilt; Role: Advisor; Mason took Masters levels courses from 2011 – 2014 and worked on my NSF CAREER grant as a researcher and developer; Current position: PhD Candidate, Computer Science, University of Michigan)

Undergraduate

Weston Sandberg (UCalgary; PURE Award 2016; Supervisor)

COURSES TAUGHT (University of Calgary)

(USRI Average > 6 / 7)

1. F2018 – EDLS 778.3 Advanced Learning Sciences (Hist & Phil Foundations LS)
2. S2018 – EDER 679.35 Conceptualizing the Learning Sciences (MEd Specialization course)
3. F2017 – EDER 678.1 - Special Topics in Learning Sciences (Cognitive & Socio Cultural Foundations LS); Cross-listed as F2016 - EDLS 778.1 - Advanced Learning Sciences (Hist & Phil Foundations LS)
4. S2017 – EDLS 779.07 Advanced Seminar in Learning Sciences (EdD and PhD students)
5. W2016 - EDER 701.7 - Advanced Research Methods (Design-Based Research)
6. F2015, 2016 - EDUC 427.02 – Intro to STEM (Elementary Specialization)
7. F2015 - EDER 679.46 - Special Topics in Educational Technology (Intro to Tech Enabled Learning) (Cross-listed as F2015 - EDER 775 - Advanced Seminar in Technology Enabled Learning Environments)
8. F2016 - EDER 678.1 - Special Topics in Learning Sciences (Cognitive & Socio Cultural Foundations LS) (Cross-listed as F2016 - EDLS 778.1 - Advanced Learning Sciences (Hist & Phil Foundations LS))

COURSES TAUGHT (AT VANDERBILT)

- | | | |
|-----------------|---|-------------------------|
| 1. EDUC 3120: | Learning & Instruction | Fall 2012, 2013, 2014 |
| 2. SCED 2690: | Intro to Scientific Literacy | Fall, 2009, 2010, 2011 |
| 3. EDUC 3900 | Design of Learning Environments | Spring 2013 |
| 4. EDUC 3900-2: | Cognitive Approaches to Learning | Spring, 2010, 2011 |
| 5. SCED 3007: | Pre-service Internship Seminar | Spring, 2010 |
| 6. SCED 3900-3: | Intro to Qualitative Methods | Spring, 2011 |
| 7. EDUC 3070: | Research group: Designing & Learning | Fall 2010, Spring, 2011 |
| 8. EDUC 3070: | Research group: Narratives in Science Education | Fall 2011, Spring 2012 |

LEADERSHIP & SERVICE (DEPARTMENT & UNIVERSITY LEVELS)**Within University of Calgary**

1. *Mentorship of and collaboration with junior faculty:*
 - a. Faculty mentor for several pre-tenure faculty (names withheld for privacy) for internal grants and research papers

2. *Member*, Research Areas Working Group, University of Calgary - Werklund School of Education, 2016 – 2018; Responsible for envisioning the thematic research priorities for the School of Education.
3. *Member*, Faculty Merit Advisory Committee, Werklund School of Education, 2015, 2017
4. *Member*, Faculty Search Committees:
 - a. Werklund School of Education, F2017 – Early Math Position, Tenure Track;
 - b. Werklund School of Education, W2017 – Learning Sciences Senior Professor Position, Tenure Track;
 - c. College of Arts, Department of Classics and Religion S2018 – Senior Instructor Position, Tenure Track
5. *Member*, Creativity Collective (University-wide) – Committee on creativity and innovation in STEM; goals include shaping mission of Canada Research Chair on Creativity and STEM, F2016 - current
6. *Member*, Curriculum writing team, Educational Studies in the Learning Sciences, F2015 - current
7. *Member*, Social Media Committee, Educational Studies in the Learning Sciences, F2016 - current

Within Vanderbilt University

1. *Chair*, Learning Sciences and Learning Environment Design (LSLED) PhD Specialization, Department of Teaching and Learning, 2014 – 2015.
2. *Co-Founder & Organizer (along with Dr. Doug Clark)* – Learning Sciences and Learning Environment Design (LSLED) PhD Specialization.
3. *Member*, Advisory Board, Vanderbilt Institute of Digital Learning (2013 – 2015).
4. *Member*, Social Media and Technology Committee (Appointed by Chancellor Zeppos).
5. *Member*, Faculty Search Committee – Faculty of Practice for Science Education, 2012; Faculty of Practice for Social Studies, 2015
6. *Member*, Peabody Diversity Committee, 2012 – 2014.

PRIOR TEACHING (NORTHWESTERN UNIVERSITY, until 2009)

Instructor, Methods of Observation of Human Behavior	Fall, 2006, Winter, 2007
Teaching Assistant, Design of Learning Environments (LS 426)	Winter, 2009
Teaching Assistant, Tools for Organizational Analysis (LOC 212)	Winter, 2008
Instructor, Physics 135 labs (Mechanics, Electricity & Magnetism & Optics)	Fall, 2000 - 2003
Teaching Assistant, Physics 135 (Mechanics, Electricity & Magnetism & Optics)	Fall, 2001, Fall 2003 Fall 2004

SOFTWARE DEVELOPMENT

1. ViMAP

Currently under development; Open Source

Designed by: Pratim Sengupta

Developers: Mason Wright and Pratim Sengupta

Description: Visual programming language for modeling scientific and mathematical phenomena designed specifically for classroom integration. Can be used by novices with no programming background. Programming primitives are written in Java. Uses Processing and Netlogo as simulation engines. Integrated with graphing functionalities. ViMAP is currently being developed to

enable users to integrate gestures, videos and motion tracking within the modeling environment. Teachers will also be able to design and add their own programming primitives through a GUI without requiring them to learn programming.

2. CTSiM

Currently under development

Designed by: Gautam Biswas, Pratim Sengupta, Doug Clark & John Kinnebrew

Description: CTSim originated based on early work on ViMAP, and integrates ViMAP-like domain specific visual programming with the Teachable Agents architecture.

3. Ecology PartSims

Date of Design: March 2011

Author: Pratim Sengupta

Developer: Pratim Sengupta

Description: Enables 10 students to control a simulation together. Each student can control agent-level characteristics in a distinct geographical region of the ecosystem.

4. Bird Butterfly Random Phenotype Models Suite

Date of Design: Ongoing

Designed by: Amanda Dickes & Pratim Sengupta

Developer: Pratim Sengupta & Mason Wright

This is a sequence of four NetLogo models of a birds-butterfly-flower ecosystem designed for 3rd and 4th grade students. These models have an explicit focus on measurement as the core learning activities, and are designed as part of a larger curriculum that integrates embodied modeling and measurement with measurement using agent-based models.

5. NIELS 2.0

Date of Design: Ongoing

Author: Pratim Sengupta

Design: Pratim Sengupta & Gokul Krishnan

Description: This is a suite of Multi-agent Based Simulations of Newtonian Electrical conduction. Some of the simulations are being integrated with real-world sensing modules, in collaboration with Stanford University.

6. MechNet 1.0

Date of Design: Dec. 2009

Author: Pratim Sengupta

Developers: Pratim Sengupta & Corey Brady

Description: This is a suite of Multi-agent Based Participatory Simulations of Newtonian Mechanics and Electrical conduction.

7. NIELS (NetLogo Investigations in Electromagnetism)

Date of Design: 2009

Author: Pratim Sengupta

Design: Pratim Sengupta & Uri Wilensky

Description: This is a suite of Multi-Agent Based Participatory Simulations of Newtonian Electrical conduction.

EARLIER RESEARCH EXPERIENCE (Until 2009)

1. 2004 – 2009

Learning Sciences

Northwestern University

Research:

a) Designing multi-agent-based, computational learning environments in physics for diverse students at multiple levels (elementary – college).

b) Knowledge representation and conceptual change in novices and experts (in Physics).

2. 2000-2004

Physics

Northwestern University

Research:

Investigating low-temperature behavior of superconducting vortices in High T_c Superconductors using Nuclear Magnetic Resonance. In particular, I investigated the vortex melting phase transition in doped BiSCCO-2212 single crystals, and penetration depth of MgB₂.

3. 1999-2000

Undergraduate Thesis, Solid State Physics

IIT Kharagpur, India

Research:

a) Experimental studies of fractal growth through electrodeposition;

b) Computational modeling of fractal & multifractal growth.

4. June, 1999 - Aug, 1999

Summer Research Intern, Condensed Matter Physics

Indian Institute of Science (IISc), Bangalore, India

Research:

Markovian simulation of focal epileptic neurons.

5. Dec. 1 - 30, 1998

Visiting Researcher

Bhabha Atomic Research Center (BARC), Bombay, India

Research:

Investigation of porosity and fractal structure of PS-PVP (Poly-Sulphone-Poly-vinyl Pyrolidone) Membranes using Small Angle X-ray Scattering.