

CURRICULUM VITAE

Pratim Sengupta

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Mind, Matter and Media Lab
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CURRENT EMPLOYMENT

Assistant Professor (Aug. 2009 – present)
Department of Teaching and Learning
Vanderbilt University, USA

RESEARCH INTERESTS

- a) Designing *low-threshold-high-ceiling* computation-based learning environments in physics;
- b) Knowledge representation and conceptual change in novices and experts;
- c) Agent-based modeling & complex systems in education.
- d) Teacher appropriation of technology-based learning environments
- e) Science education in urban settings

EDUCATION

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 (2003)
PhD Candidate (terminated - 2004)
Northwestern University, USA

Dissertation Research: NMR investigation of High-Tc Superconductors

1998 – 2000 Integrated M.Sc, Solid State Physics
Indian Institute of Technology (IIT), Kharagpur, India

1995 – 1998 B.Sc (Honors), Physics
Minors: Math, Chemistry
Presidency College, Calcutta, India

AWARDS

1. Northwestern University Dissertation Year Fellowship, 2008-2009.
2. Northwestern Institute for Complex Systems (NICO) Best Poster Award, 2008

3. Center for the Curricular Materials in Sciences (CCMS) Graduate Fellowship, 2005 – 2008
4. Materials Research Center Fellowship, Northwestern University, 2002 – 2004
5. Graduate Travel Award, Northwestern University, 2008, 2007, 2006, 2005
6. Departmental Fellowship, Department of Physics, Northwestern University, 2000 – 2002
7. K.L. Chopra Award for “Best Final Year Research Project” (all Science departments), IIT Kharagpur, 2000.
8. Departmental proficiency Award, “Best Final Year Research Thesis” (Physics), IIT Kharagpur, 2000.

PREVIOUS RESEARCH EXPERIENCE

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.

REFEREED PUBLICATIONS

[A] Journals

Sengupta, P., & 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.

Chen, B., Sengupta, P., Halperin, W. P., Sigmund, E. E., Mitrović V. V., Lee, M. H., Kang, K. H., Mean, B. J., Kim, J.Y., & Cho, B.K. (2006). Anisotropy and penetration depth of MgB₂ from ¹¹B NMR. *New Journal of Physics*. Vol. 8 pp 274.

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.

[B] Invited Book Chapters

Sengupta, P., & Wilensky, U. (In Press). Multi-Agent-Based Modeling and Learning Electricity: Design and Epistemological Issues. In Khine, M.S., & Saleh, I.M (Eds.). *Dynamic Modeling: Cognitive Tool for Scientific Enquiry*. Springer-Verlag, New York, NY.

[C] Conference Proceedings / Conferences

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.

Sengupta, P., & Wilensky, U. (2009). *Agent-based Models and Learning Electricity*. Paper presented at the annual meeting of the American Educational Research Association (AERA 2008), New York, NY.

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.

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.

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.

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.

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.

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.

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. The Netherlands: ISLS.

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.

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.

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.

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.

COURSES TAUGHT AT VANDERBILT

SCED 2690: Intro to Scientific Literacy	Fall, 2009
Cognitive Approaches to Learning	Spring, 2010

PRIOR TEACHING EXPERIENCE

Instructor, Methods of Observation of Human Behavior (SESP 372)	Fall, 2006, Winter, 2007 Fall, 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 – Fall, 2003
Teaching Assistant, Physics 135 (Mechanics, Electricity & Magnetism & Optics)	Fall, 2001, Fall 2003, Fall 2004