

# Michelle Hoda Wilkerson-Jerde

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## RESEARCH INTERESTS

I am primarily interested in the development and implementation of computer based learning environments for promoting mathematical, computational and scientific literacies, with special attention to constructionist theory and design. My work is heavily influenced by the work of my advisor Uri Wilensky and scholars such as James Kaput, Seymour Papert, Hans Freudenthal, Andi diSessa and others who seek to make the power of mathematical thinking, broadly conceived, accessible to all. For my dissertation, I am developing a computational modeling environment, *DeltaTick*, that helps students connect the behavior of real-world systems to the mathematical and symbolic ideas that are traditionally used to explore them. Specifically, it does this by enabling students to define the elements, features, and behaviors of a system of interest, and then to execute those behaviors over time to examine the mathematical patterns that result.

My other research interests include mathematics cognition and knowledge representation, and emerging visualization technologies for mathematics and science education.

## EDUCATION

**Ph.D. Learning Sciences** in progress  
Northwestern University  
*Advisor: Uri J. Wilensky*

**B.A. Mathematics, Elementary Education** SP 2005  
University of San Diego  
*Summa Cum Laude, Phi Beta Kappa*

## PUBLICATIONS

[Journals]

**Wilkerson-Jerde, M.** & Wilensky, U. (Under Review). How do mathematicians learn math?: A framework for reconciling experts' formal and informal reasoning strategies.

**Wilkerson, M.** (In Press). Computer Math Snapshots. Agents with attitude: Exploring coombs unfolding technique. *International Journal of Computers for Mathematical Learning*.

## PUBLICATIONS

[Conference Proceedings]

Stonedahl, F., **Wilkerson-Jerde, M.** & Wilensky, U. (2009). Re-conceiving introductory computer science curricula through agent-based modeling. To appear in *Proceedings of the AAMAS 2009 Workshop on Educational Uses of Multi-Agent Systems (EduMAS '09)*.

**Wilkerson-Jerde, M.** & Wilensky, U. (2009). Understanding proof: Tracking experts' developing understanding of an unfamiliar proof. To appear in *Proceedings of the International Commission on Mathematical Instruction Study 19, Proof and proving in mathematics education*.

**Wilkerson, M.** & Wilensky, U. (2008). How Do Mathematicians Learn Mathematics? To appear in *Proceedings of the Joint Meeting of PME 32 and PME-NA XXX*, July 17-21.

Denning, T., Griswold, W. G., Simon, B. & **Wilkerson, M.** (2006). Multimodal communication in the classroom: What does it mean for us? In *SIGCSE '06: Proceedings of the 37th SIGCSE technical symposium on Computer science education*.

**Wilkerson, M.**, Griswold, W. G. & Simon, B. (2005). Ubiquitous presenter: Increasing student access and control in a digital lecturing environment. In *SIGCSE '05: Proceedings of the 36th SIGCSE technical symposium on Computer science education*.

## PRESENTATIONS

[Papers Without Proceedings]

**Wilkerson-Jerde, M.** & Wilensky, U. (2009). Complementarity in equational and agent-based models: A pedagogical perspective. In M. Jacobson (Org.), *Complexity, Learning, and Research: Under the Microscope, New Kinds of Microscopes, and Seeing Differently*. Paper accepted for presentation at AERA 2009, San Diego, CA, April 13-17.

**Wilkerson, M.** & Wilensky, U. (2008). Embedding environments as a mechanism for mathematical reasoning: An expert study. Paper presented at the AERA 2008, New York, NY, March 24-28.

Sengupta, P., **Wilkerson, M.** & Wilensky, U. (2007). On the relationship between spatial knowledge and learning electricity: Comparative case studies of students using 2D and 3D emergent, computational learning environments. Paper presented at AERA 2007, Chicago, IL, April 9-13.

[Posters]

**Wilkerson, M.**, Sengupta, P., & Wilensky, U. (2008). Perceptual supports for sensemaking: A case study using multi agent based computational learning environments. *Proceedings of the International Conference of the Learning Sciences*. Utrecht, The Netherlands: ICLS.

AWARDS	<p><b>Predoctoral Training Fellowship</b> FA 2006 - SU 2009 Multidisciplinary Program in Education Sciences, Northwestern U.</p> <p><b>Cognitive Science Fellowship</b> FA 2005 - SU 2006 Cognitive Science Program, Northwestern University</p> <p><b>Undergraduate Research Fellowships</b> San Diego Supercomputing Center, U.C. San Diego SU 2004 Human-Computer Interaction Center, U. of Oklahoma SU 2003</p>
	<p><b>Learning Sciences 403</b> FA 2006, FA 2007 <i>Cognitive Science Foundations for the Learning Sciences</i> Profs. Penelope Peterson and Andrew Ortony</p> <p><b>Learning Sciences 426</b> WI 2008, SP 2009 <i>The Design of Technological Tools for Thinking and Learning</i> Prof. Uri Wilensky</p>
	<p><b>DeltaTick</b> In Progress A computational construction kit to introduce students to the core ideas of calculus and differential equations through the NetLogo modeling environment. Written in Java, with Uri Wilensky and the Center for Connected Learning and Computer-Based Modeling, Northwestern University.</p> <p><b>Ubiquitous Presenter 1.0</b> 2005 An application built for the Tablet PC that allows instructors to annotate slides and students to create submissions for in-class activities on the web. Written in C# and PHP, with William Griswold and Beth Simon, Univ. of California, San Diego.</p>
TEACHING ASSISTANTSHIPS	
SOFTWARE DESIGN	
PROFESSIONAL MEMBERSHIPS & SERVICE	<p>[Memberships] American Educational Research Association International Society for the Learning Sciences International Group for the Psychology of Mathematics Education</p> <p>[Reviewing] Interaction, Design &amp; Children, 2008 American Educational Research Association Annual Meeting, 2009 International Journal of Computers for Mathematical Learning</p> <p>[At Northwestern] Student Representative, Computational Literacy Job Search Committee Student Panelist, Spencer Mixed Methods Conference, 2008</p> <p>[Students] Abigail Jacobs. <i>Project: Design principles for 3D agent-based models.</i> Zachary Moy. <i>Project: An agent-based model of light polarization.</i></p>