

# Matthew Zeidenberg

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## Professional Profile

Ph.D. computer scientist, sociologist, and data scientist with deep expertise in machine learning, artificial intelligence, statistics, experimental design, and program evaluation as well as the substantive social science areas of education and workforce development. Expert in the design and conduct of social experiments, with significant experience with several such experiments. Familiar with a wide range of machine learning algorithms, plus extensive experience with large administrative and survey-based data sets, statistical analysis including regression analysis and propensity score matching, cluster analysis, database systems, and text processing. Author of a book on neural networks. Experience with a wide range of specialized and general purpose programming languages, including Python (and Scikit-Learn), R, Stata, SAS, Perl, and Lisp. Strong knowledge and experience with the design, conduct, and analysis of experiments. Author or co-author of many publications, often that focus on programs to help the disadvantaged obtain education and progress in their careers, and/or which apply machine learning and data science to educational and labor market data.

## Education

Ph.D., Computer Science, University of Wisconsin, Madison

Ph.D., Sociology, University of Wisconsin, Madison

B.A., Physics (with honors), Harvard University

## Experience

Lead Data Science Instructor, Principal Data Scientist

Galvanize

New York City

2020-present

Leads instruction for a 13-week full-time immersive program in data science. covering the following topics: scientific Python, probability, statistics (Probability, A/B Testing, Bayesian methods, Regression methods, Time Series), SQL, Machine Learning (Decision Trees, Random Forest, Boosting, Support Vector Machines, Clustering, Natural Language Processing, Recommenders, Graphs), Data Engineering (Hadoop, Hive, and MapReduce), Data Visualization (d3), and data at scale.

Senior Scientist  
Abt Associates  
New York City  
2014-2020

Worked on and/or led a variety of research and evaluation projects, mainly in the policy areas of education and the workforce. Applied advanced techniques from computer science and data science to these projects. Lead researcher on a project for the U.S. Department of Labor that is applying machine learning and visualization to data from resumes and job postings in order to study career advancement and the relationship between labor supply and demand. Applied machine learning to the classification of responses to surveys. Principal investigator for a randomized controlled trial of the effectiveness of smartphone-based interventions at two large urban community colleges. Analyzed data and wrote impact analyses for a two large multi-site evaluations of career pathway programs. Worked on a planning project for the Department of Labor on future directions for career pathways research. Served as the main designer and technical lead for a proposed Department of Labor experiment with the crowd-sourcing of occupational data using wiki technology. Co-author of reports for the U.S Departments of Labor, Health and Human Services, and Agriculture, and for the federal Corporation for National and Community Service.

Senior Research Associate  
Community College Research Center  
Teachers College, Columbia University (New York, New York)  
2006-2014

Worked on a variety of research projects involving college student data. Analyzed programs of study and transcripts of students using advanced techniques from statistics and computer science, including clustering and machine learning. Studied such issues as workforce development, science and technology education, remedial education, student persistence, and college degree attainment. Participated in program evaluations, including a impact evaluation of developmental summer bridge programs at colleges in Texas. Lead author of the Center's most recent evaluation of Washington's well-known I-BEST program that connects low-skill people with training and jobs. Worked with state community college officials, analyzed large administrative data sets on community college students. Set up and managed the research group's scientific computing network.

Senior Research Associate  
Center on Wisconsin Strategy  
Madison, Wisconsin  
1991-2006

Performed research, wrote, and worked on a variety of reports concerning regional economic development, workforce development, career mobility, income and poverty, labor markets, and other subjects. Worked with geographic information systems to produce maps for these reports. Lead analyst for the Center's signature publication,

“The State of Working Wisconsin.” Installed and managed the Center’s computer networks. Performed data management and statistical computing for a research project on the federal litigation activity of large American corporations.

## Publications and Presentations

Downloadable versions of many of the following can be found at [www.mattzeidenberg.com/publication](http://www.mattzeidenberg.com/publication)

David Fein, Matthew Zeidenberg and Yuhan Jao. “Promoting Successful Transitions to Careers for Young Adults: Impacts on School to Work Sequences.” Presentation at the Association for Public Policy Analysis and Management Fall Research Conference, November 2019.

Matthew Zeidenberg. “Informing the Design of Career Pathway Programs Using Data on Occupational Transitions in the Wider Labor Market.” Presentation at the Association for Public Policy Analysis and Management Fall Research Conference, November 2019.

Christopher W. Logan, Matthew Zeidenberg, Vinh Tran, Maria Boyle, Ayesha Enver, and Michele Mendelson. “School Nutrition and Meal Cost Study Final Report, Volume 3: School Meal Costs and Revenues.” United States Department of Agriculture, Food and Nutrition Service, 2019.

Jill Hamadyk and Matthew Zeidenberg. “Des Moines Area Community College Workforce Training Academy Connect Program: Implementation and Early Impact Report.” Administration for Children and Families, U.S. Department of Health and Human Services, 2018.

Rachel Cook, Jill Hamadyk, Matthew Zeidenberg, Howard Rolston and Karen Gardiner. “Madison Area Technical College Patient Care Pathway Program: Implementation and Early Impact Report.” Administration for Children and Families, U.S. Department of Health and Human Services, 2018.

Laura R. Peck, Matthew Zeidenberg, Sung-Woo Cho, Daniel Litwok, Julie Strawn, Maureen Sarna, Karin Martinson, and Deena Schwartz. “Career Pathways Design Study: Evaluation Design Options Report.” Chief Evaluation Office, U.S. Department of Labor, 2018.

Judith Alamprese, Sarah Costelloe, Cristofer Price, and Matthew Zeidenberg. 2017. “Evaluation of the Community College Consortium for Bioscience Credentials (C3bc): Final Report.” Abt Associates. February 2017.

Michelle Van Noy and Matthew Zeidenberg. “Community College Pathways to the STEM Workforce: What Are They, Who Follows Them, and How?” *New Directions for Community Colleges*, pp. 9-21, 2017.

Marc Scott and Matthew Zeidenberg. “Order or Chaos? Understanding Career Mobility Using Categorical Clustering and Information Theory.” *Longitudinal and Life Course Studies* 7:4, 2016.

Matthew Zeidenberg, Brian Freeman, Eric Friedman and Allan Porowski. "Results from the National Student Clearinghouse Match: New Methods for Assessing AmeriCorps Alumni Outcomes." Washington, DC: Corporation for National and Community Service, 2016.

Matthew Zeidenberg and Eric Friedman. "One Outcome, Two Methods: Comparing the Cost, Quality, and Utility of Survey and Administrative Data Sources." Presentation at the Corporation for National and Community Service Research Summit, Washington DC, 2016.

Matthew Zeidenberg, Marc Scott, and Clive Belfield. "What About the Non-Completers? The Labor Market Returns to Progress in Community College." *Economics of Education Review* 49, pp. 142-156, December 2015.

Matthew Zeidenberg. "Valuable Learning or 'Spinning Their Wheels'? Understanding Excess Credits Earned by Community College Associate Degree Completers." *Community College Review* 43:2, pp. 123-141, March 2015,

Michelle Van Noy, Matthew Zeidenberg. Hidden STEM Producers: Community Colleges' Multiple Contributions to STEM Education and Workforce Development. Washington, DC: National Academy of Sciences, Board on Science Education, 2014.

Elizabeth A. Barnett, Rachel Hare Bork, Alexander Mayer, Joshua Pretlow, Heather Wathington, Madeline Joy Weiss, Evan Weissman, Jedediah Teres and Matthew Zeidenberg. "Bridging the Gap: An Impact Study of Eight Developmental Summer Bridge Programs in Texas." New York, National Center on Postsecondary Research, Teachers College, Columbia University, 2012.

Matthew Zeidenberg. "Starting with the End in Mind: Mapping Current Students' Program Pathways Using the Transcripts of Completing Students." Presentation Given at the Conference of the Council for the Study of Community Colleges, April 2012.

Matthew Zeidenberg. "Keeping the End in Mind: Examining Completers' Course-Taking to Improve Advising and Program Design." Presentation given at the Conference of the American Association of Community Colleges, April 2012.

Matthew Zeidenberg and Marc Scott. "The Content of their Coursework: Understanding Course-Taking Patterns at Community Colleges by Clustering Student Transcripts." New York: Community College Research Center, Working Paper No. 35, October 2011.

Matthew Zeidenberg and Michelle Van Noy. "The Quality of Middle-skill Jobs and the Role of Community Colleges." Presentation given at the New England Workforce Network Conference, April 2011.

Sung-Woo Cho, Madeline Joy Weiss, Matthew Zeidenberg & Davis Jenkins. "Get with the Program: Accelerating Community College Students' Entry into and Completion of Programs of Study." Presentation given at the Conference of the Council for the Study of Community Colleges, April 2011.

Matthew Zeidenberg, Sung-Woo Cho & Davis Jenkins. "Washington State's Integrated Basic Education and Skills Training Program (I-BEST): New Evidence of Effectiveness." New York: Community College Research Center, Teachers College, Columbia University, Working Paper No. 20, September 2010.

Michelle Van Noy, Matthew Zeidenberg, and James Jacobs. "Middle Skill Jobs: The Projected Demand and Community Colleges' Response." Presentation given at the League for Innovation in the Community College Conference, March 2010.

Matthew Zeidenberg and Thomas Bailey. "Human Resource Development and Career and Technical Education in American Community Colleges." Paper prepared for the Human Resources Development Group meeting of the Asia-Pacific Economic Cooperation (APEC) organization, March 2010.

Benjamin A. Carreras, David E. Newman, Matthew Zeidenberg and Ian Dobson. "Dynamics of an Economics Model for Generation Coupled to the OPA Power Transmission Model." In *Proceedings of the Annual Hawaii International Conference on System Sciences*, 2010.

Davis Jenkins, Shanna Smith Jaggars, Josipa Roksa, Matthew Zeidenberg and Sung-Woo Cho. "Strategies for Promoting Gatekeeper Course Success Among Students Needing Remediation: Research Report for the Virginia Community College System." New York, NY: Community College Research Center, Teachers College, Columbia University, 2009.

Davis Jenkins, Matthew Zeidenberg, John Wachen and Craig Hayward. "Educational Outcomes of Cabrillo College's Digital Bridge Academy: Findings from a Multivariate Analysis." Report, Community College Research Center, 2009.

Michelle Van Noy and Matthew Zeidenberg. "American Community Colleges in the Downturn." *Digital Learning (India)*, June 2009.

Davis Jenkins, Matthew Zeidenberg, and Gregory Kienzl. "Educational Outcomes of I-BEST, Washington State Community and Technical College System's Integrated Basic Education and Skills Training Program: Findings from a Multivariate Analysis." Working Paper #16. New York, NY: Community College Research Center, Teachers College, Columbia University, 2009.

Benjamin A. Carreras, David E. Newman, Ian Dobson, and Matthew Zeidenberg. "The Impact of Risk-Averse Operation on the Likelihood of Extreme Events in a Simple Model of Infrastructure." *Chaos: An Interdisciplinary Journal of Nonlinear Science* 19(4), October 2009.

Benjamin A. Carreras, David E. Newman, Ian Dobson, and Matthew Zeidenberg. "A Simple Model for the Reliability of an Infrastructure System Controlled by Agents." In *Proceedings of the 42nd Annual Hawaii International Conference on System Sciences, HICSS*, 2009.

Matthew Zeidenberg. "Community Colleges Under Stress." *Issues in Science and Technology* 24:4, 2008.

Davis Jenkins and Matthew Zeidenberg. "Developmental Education Placement Policies and Student Success in the Connecticut Community Colleges." Research Report to the Connecticut Community Colleges System. New York, NY: Community College Research Center, Teachers College, Columbia University, 2007.

Pablo Mitnik and Matthew Zeidenberg. "From Bad to Good Jobs? An Analysis of the Prospects for Career Ladders in the Service Industries." Report, Center on Wisconsin Strategy, 2007.

Matthew Zeidenberg, Davis Jenkins, and Juan Carlos Calcagno. "Do Student Success Courses Actually Help Community College Students Succeed?" Brief #36. New York, NY: Community College Research Center, Teachers College, Columbia University, 2007.

Matthew Zeidenberg. "Agent-Based Models of Urban Industrial Specialization." Paper presented at the Agent 2005 Conference on Generative Social Processes, Models, and Mechanisms, Chicago, 2005.

Marc A. Scott, Matthew Zeidenberg, Annette Bernhardt, and Laura Dresser. "Mapping Career Paths in the U.S. Labor Market." Paper presented at the Wharton School Conference on Careers and Career Transitions, Philadelphia, PA, June 2005.

Matthew Zeidenberg, "Moving Outward: The Shifting Landscape of Poverty in Milwaukee." Madison, WI: Center on Wisconsin Strategy, August 2004.

Pablo A. Mitnik and Matthew Zeidenberg, "Too Many Bad Jobs: An Analysis of the Prospects for Career Ladder Initiatives in the Service Economy." Paper presented at the 56<sup>th</sup> Annual Meeting of the Industrial Relations Research Association, San Diego, January 2004.

Matthew Zeidenberg. "Reflecting Society: Studies in Federal Civil Litigation Involving Businesses, 1971-2004." Ph.D. Thesis, Sociology, University of Wisconsin-Madison, 2004

Matthew Zeidenberg. "Sifting and Winnowing: Approaches to Finding Useful Information on the Web." Ph.D. Thesis, Computer Science, University of Wisconsin-Madison, 2003

Pablo A. Mitnik, Matthew Zeidenberg, and Laura Dresser, "Can Career Ladders Really Be a Way Out of Dead-End Jobs? A Look at Job Structure and Upward Mobility in the Service Industries." Paper presented at the Association for Public Policy Analysis and Management Fall Research Conference, November 2002.

Matthew Zeidenberg, "The Self-Regulated Workplace: Joint Worker-Management Governance of Occupational Safety and Health." Madison, WI: Center on Wisconsin Strategy, 2000.

Brian Bosworth, Daniel Braun, Joel Rogers, and Matthew Zeidenberg, "Using Regional Economic Analysis in Urban Jobs Strategies." Chapel Hill, NC: Regional Technology Strategies, Inc., 1997.

Matthew Zeidenberg. "Kill the King: Monopolies, Alliances, and Litigation in the American Computer Industry." M.S. Thesis, Sociology, University of Wisconsin-Madison, 1996. Earlier

versions presented at the 1993 conference on "Changing Patterns of Business Disputing," Institute for Legal Studies, University of Wisconsin-Madison, and at the 1993 Midwest Sociological Society meeting.

George Tsibouris and Matthew Zeidenberg, "Testing the Efficient Markets Hypothesis with Gradient Descent Algorithms," in Apostolos-Paul Refenes, ed., *Neural Networks in the Capital Markets*, Wiley: New York, 1995.

George Tsibouris and Matthew Zeidenberg, "Back Propagation as a Test of the Efficient Markets Hypothesis." Proceedings of the Hawaii International Conference on System Sciences, IEEE, 1992.

Matthew Zeidenberg, "Implementing Spatial Relations in Neural Nets: The Case of Figure/Ground and Containment," Technical Report, Electrotechnical Laboratory, Tsukuba, Ibaraki, Japan, 1991.

George Tsibouris and Matthew Zeidenberg, "Predicting Stock Market Fluctuations using Neural Network Models." Paper presented at the Annual Meeting of the Society for Economic Dynamics and Control, Capri, Italy, 1991.

Matthew Zeidenberg, *Neural Networks in Artificial Intelligence*, Ellis Horwood Ltd., Chichester UK, 1990, 268pp. (book)

Matthew Zeidenberg. "Fortran Compilers." *MacWorld*. March 1989.

Matthew Zeidenberg. "Unix a la Mac." *MacWorld*. October 1988.

Matthew Zeidenberg. "Snowflakes and Dragons: Drawing Fractals with Macintosh Pascal." *MacWorld*, August 1985.

Matthew Zeidenberg. "Modeling the Brain." *Byte*, December 1987