

CURRICULUM VITAE

MARK J. WIERMAN

ADDRESS

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EDUCATION

1978	B.A. in Mathematics Purchase College 735 Anderson Hill Road Purchase, NY 10577 914-251-6000
1980	M.A. in Mathematics Binghamton University PO Box 6000 Binghamton, NY 13902 607-777-2000
1993	Ph.D in Advanced Technology Binghamton University PO Box 6000 Binghamton, NY 13902 607-777-2000

Thesis title: *Possibilistic Image Processing*
Supervisor: Distinguished Professor George J. Klir

PROFESSIONAL EXPERIENCE

- 2010-2013 Associate Professor
Journalism, Media & Computing
- 2001-2010 Associate Professor
Computer Science
- 1994-2001 Assistant Professor
Mathematics & Computer Science
Creighton University
2500 California Plaza
Omaha, NE 68178 402-280-2700
- 1993-1993 Researcher
Department of Modeling and Simulation
Rome Laboratory - Griffis Air Force Base
26 Electronic Parkway
Rome, New York 13441-4514
- 1989-1991 Programmer
IBM Endicott
1701 North St,
Endicott, NY 13760
607-755-0123
- 1985-1989 Graduate Assistant
System Science Department
Binghamton University
PO Box 6000
Binghamton, NY 13902
607-777-2000
- 1981-1985 Instructor
Mathematics and Computer Science
State University College at Oneonta
108 Ravine Parkway
Oneonta, NY 13820
607-436-3500
- 1985-1989 Teaching Assistant
Mathematics Department
Binghamton University
PO Box 6000
Binghamton, NY 13902
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TEACHING

Computer Science

My general field of teaching specialization is computer graphics. I teach computer graphics, human-computer interaction, Windows programming, mobile app programming, and web-programing.

Table 1: Subject Areas Taught

Fuzzy Set Theory	Computer Graphics
Data structures	Discrete Math
Human-Computer Interaction	Godel, Escher, Bach
Computer Science I and II	Object-Oriented Design
Theory of Computation	Uncertainty-Based Information
Web Programming	Windows Programming

Other teaching contributions

The curricula for the undergraduate classes CSC 444 Human-Computer Interaction and CSC 552 Windows Programming were both developed by me. CSC 544 is taught entirely from lecture notes that are downloadable from my website.

In 2006 I started teaching classes in Creighton's honors program. My first class was HRS 303 Fuzzy Set Theory. One of the in HRS303 students suggested I teach an honors class based on the Pulitzer Prize winning book *Godel, Escher, Bach*, and this resulted in the development of HRS 312, which was a very successful class. I also reprised HRS 303 in the Spring of 2008 and Fall of 2010.

In 2007, Dr. Terry D. Clark and I designed a new graduate program, titled Research Design Analysis which enrolls approximately 25 students a semester. It is basically Informatics for Political Science. I primarily teach Computer Applications for the Social Sciences which focuses on R, a computer language for Statistics and Data Minipulation.

All of my classes have syllabi, class notes, resource pointers, etc. on the Internet at my website, URL: <http://duck.creighton.edu/>.

BOOKS

- [1] Peter C. Casey, Michael B. Gibilisco, Carly A. Goodman, Kelly Nelson Pook, John N. Mordeson, Mark J. Wierman, and Terry D. Clark. *Fuzzy Social Choice Models: Explaining the Government Formation Process*. Springer, Berlin, 2014.
- [2] Michael B. Gibilisco, Annie M. Gowen, Karen E. Albert, John N. Mordeson, Mark J. Wierman, Terry D. Clark, and Alex Pham. *Fuzzy Social Choice Theory*. Springer, Berlin, 2014.
- [3] John N. Mordeson, Mark J. Wierman, Terry D. Clark, Alex Pham, and Michael A. Redmond. *Linear Models in the Mathematics of Uncertainty*. Springer, Berlin, 2013.
- [4] Mark J. Wierman. *An Introduction to the Mathematics of Uncertainty*. Creighton University, Creighton University, 2010. URL <http://fuzzy.creighton.edu/download/MOU.pdf>.
- [5] Terry D. Clark, Jennifer M. Larson, John N. Mordeson, Joshua D. Potter, and Mark J. Wierman. *Applying Fuzzy Mathematics to Formal Models in Comparative Politics*. Springer-Verlag, Berlin, 2008.
- [6] G. J. Klir and M. J. Wierman. *Uncertainty-based information*. Physica-Verlag, New York, 1998. ISBN 3-7908-1073-8.

CHAPTERS

- [7] Eric N. Fischer, Ciprianna M. Dudding, Tyler J. Engel, Matthew A. Reynolds, Mark J. Wierman, John N. Mordeson, and Terry D. Clark. *Explaining Variation in State Involvement in Cyber Attacks: A Social Network Approach*, pages 63–74. Springer, Berlin, 2013.
- [8] Morgan L. Eichman, James A. Rolfsen, Mark J. Wierman, John N. Mordeson, and Terry D. Clark. *The Global Spread of Islamism: An Agent-Based Computer Model*, pages 407–426. Springer, Berlin, 2013.
- [9] Mark J. Wierman. *Syzygy*, volume 2, pages 327–334. Springer, Berlin, 2013.

JOURNAL ARTICLES

- [10] Mark J. Wierman. Zet theory. *Intelligent Automation & Soft Computing*, pages 1–2, Accepted.

- [11] Peter Colum Casey, Mark J. Wierman, Michael B. Gibilisco, John N. Mordeson, and Terry D. Clark. Assessing policy stability in iraq: a fuzzy approach to modeling preferences. *Public Choice*, 151(3-4):409–423, 2012. ISSN 0048-5829. URL <http://dx.doi.org/10.1007/s11127-010-9751-1>.
- [12] William J. Tastle, Emil Boasson, and Mark J. Wierman. Assessing team performance in information systems projects. *Information Systems Education Journal*, 7, September 15, 2009. URL <http://isedj.org/7/90/>.
- [13] William J. Tastle, J. Russell, and Mark J. Wierman. A new measure to analyze student performance using the likert scale. *Information Systems Education Journal*, 6(35), 2008.
- [14] John N. Mordeson, Terry D. Clark, Adam Karnik, Jacob Moore, and Mark J. Wierman. Determining the causes of democratic consolidation: A consideration of several fuzzy methods. *New Mathematics and Natural Computation (NMNC)*, 05(02):353–369, 2009.
- [15] Terry D. Clark, John N. Mordeson, Jennifer M. Larson, and Mark J. Wierman. Choice functions and upper choice functions. *New Mathematics and Natural Computation*, 4(2):177–190, 2008.
- [16] William J. Tastle and Mark J. Wierman. E-business decision making by agreement. *Int. J. of E-Business Research*, 4:531–545, 2008.
- [17] Terry D. Clark, Jennifer M. Larson, John N. Mordeson, and Mark J. Wierman. Extension of the portfolio allocation model to surplus majority governments: A fuzzy approach. *Public Choice*, 134(3–4):179–199, 2008.
- [18] William J. Tastle and Mark J. Wierman. Consensus and dissent: A measure of ordinal dispersion. *International Journal of Approximate Reasoning*, 45(3):531 – 545, 2007. ISSN 0888-613X. URL <http://www.sciencedirect.com/science/article/pii/S0888613X06001186>.
- [19] Terry D. Clark, Jennifer M. Larson, John N. Mordeson, and Mark J. Wierman. Why so much stability in coalition formation: A fuzzy answer. *In Progress*, 2007.
- [20] Terry D. Clark, Jennifer M. Larson, John N. Mordeson, and Mark J. Wierman. Toward resolving the property ranking issue: An exploration of fuzzy mathematics. volume 3, pages 1–26. The Society for Mathematics of Uncertainty, Creighton University, 2007.
- [21] John N. Mordeson, Terry D. Clark, Mark J. Wierman, Jennifer M. Larson, and Adam D. Grieser. Specifying theories in comparative politics: Toward a more thoroughly deductive approach. *New Mathematics and Natural Computation*, 3(2):165–189, 2007.

- [22] John N. Mordeson, Terry D. Clark, Mark J. Wierman, Jennifer M. Larson, and Adam D. Grieser. An inductive approach to determining causality in comparative politics: A fuzzy set alternative. *New Mathematics and Natural Computation*, 3(2):191–207, 2007.
- [23] William J. Tastle, Mark J Wierman, and U. Rex Dumdum. Ranking ordinal scales using the consensus measure: Analyzing survey data. *Issues in Information Systems*, (1-2):96–102, 2005.
- [24] J. Liang, Z. Shi, D. Li, and M. J. Wierman. Information entropy, rough entropy and knowledge granulation in incomplete information systems. *Int. J. of General Systems*, 35(6):641–654, 2006.
- [25] Mark J. Wierman. Measuring granularity in evidence theory. *Int. J. of General Systems*, 30(6):649–660, 2001.
- [26] Mark J. Wierman. Measuring uncertainty in rough set theory. *Int. J. of General Systems*, 28(4,5):283–297, 1999.
- [27] Mark J. Wierman. Generalized representation and extension. *Fuzzy Sets and Systems*, 106(3):387–392, 1999.
- [28] Mark J. Wierman. Extending set functions and relations. *Int. J. of General Systems*, 26(3):91–96, 1997.
- [29] Mark J. Wierman. Assessing fuzzy sets and the potential of possibility theory. *Intelligent Systems*, 88:247–261, 1996.
- [30] Mary K. Dobransky and Mark J. Wierman. Genetic algorithms: A search technique applied to behavior analysis. *Intern. J. of General Systems*, 24 (1–2):125–135, 1996.
- [31] George J. Klir and Mark J. Wierman. On properties of the v -uncertainty. In J. L. Chameau and J. T. P. Yau, editors, *Proc. 1987 NAFIPS Workshop*, pages 96–106, 1987.

CONFERENCE PAPERS

- [32] Mark J. Wierman. Solving games. In *Fuzzy Information Processing Society (NAFIPS), 2016 Annual Meeting of the North American*, pages 1–6, 2016. ISSN accepted.
- [33] Mark J. Wierman. Osherson, smith and elkan. In *Fuzzy Information Processing Society (NAFIPS) held jointly with 2015 5th World Conference on Soft Computing (WConSC), 2015 Annual Conference of the North American*, pages 1–6, 2015.

- [34] Mark J. Wierman. Psychologists: Are they logically fuzzy? In *IFSA World Congress and NAFIPS Annual Meeting (IFSA/NAFIPS), 2013 Joint*, pages 854–859, 2013.
- [35] Mark J. Wierman. Dempster, Shafer, and aggregate uncertainty. In *Norbert Wiener in the 21st Century (21CW), 2014 IEEE Conference on*, pages 1–7, 2014.
- [36] M.J. Wierman, T.D. Clark, J.N. Mordeson, and W.J. Tastle. A critique of fuzzy rational choice models. In *Fuzzy Information Processing Society (NAFIPS), 2012 Annual Meeting of the North American*, pages 1–6, 2012. ISSN pending.
- [37] Mark J. Wierman and William J. Tastle. Multi-dimensional dissent. In *Fuzzy Information Processing Society (NAFIPS), 2011 Annual Meeting of the North American*, pages 1–5, 2011.
- [38] Mark J. Wierman. Cloud sets as a measure theoretic basis for fuzzy set theory. In *Fuzzy Information Processing Society (NAFIPS), 2010 Annual Meeting of the North American*, pages 1–5, 2010.
- [39] Mark J. Wierman and William J. Tastle. Measurement theory and sub-*sethood*. In *Fuzzy Information Processing Society (NAFIPS), 2010 Annual Meeting of the North American*, pages 1–5, 2010.
- [40] Mark J. Wierman. The square root of not: Geometric, permutation, and matrix representations. In *Fuzzy Information Processing Society, 2009. NAFIPS 2009. Annual Meeting of the North American*, pages 1–5, 2009.
- [41] William J. Tastle, J. Russell, and Mark J. Wierman. Visualization of mutual fund risk using the consensus theory measure of agreement. In *Fuzzy Information Processing Society, 2009. NAFIPS 2009. Annual Meeting of the North American*, pages 1–6, 2009.
- [42] Jennifer M. Larson, Mark J. Wierman, Adam Karnik, John N. Mordeson, and Terry D. Clark. Factors contributing to successful democratic consolidation in former communist states: An exploration of solutions to the property ranking issue. In *Fuzzy Information Processing Society, 2009. NAFIPS 2009. Annual Meeting of the North American*, pages 1–5, 2009.
- [43] Terry D. Clark, John N. Mordeson, Lance Neilson, and Mark J. Wierman. Fuzzy geometry: Applied to comparative politics. In Paul P. Wang, John N. Mordeson, and Mark J. Wierman, editors, *Critical Review*, volume 2, pages 1–12. The Society for Mathematics of Uncertainty, Creighton University, 2008.
- [44] William J. Tastle and Mark J. Wierman. Agreement, agreement distributions, and distance. In *Fuzzy Information Processing Society, 2008. NAFIPS 2008. Annual Meeting of the North American*, pages 1–4. Montreal, Canada, 2008.

- [45] Mark J. Wierman. Partitions and pignistic distributions in git. In *Fuzzy Information Processing Society, 2008. NAFIPS 2008. Annual Meeting of the North American*, pages 1–5, 2008.
- [46] Terry D. Clark, Jennifer M. Larson, John N. Mordeson, and Mark J. Wierman. Applying fuzzy logic to comparative politics: A proposal. In Paul P.Wang, John N.Mordeson, and Paul Y. Cao, editors, *Critical Review*, volume 1, pages 19–23. The Society for Mathematics of Uncertainty, Creighton University, 2007.
- [47] William J. Tastle and Mark J. Wierman. Using consensus to measure weighted targeted agreement. In *Fuzzy Information Processing Society, 2007. NAFIPS '07. Annual Meeting of the North American*, pages 31–35. Montreal, Canada, 2007.
- [48] Mark J. Wierman. Dissent based k-system analysis. In *NAFIPS 2007*. Montreal, Canada, 2007.
- [49] Mark J. Wierman, John N. Mordeson, Jennifer M. Larson, and Terry D. Clark. Fuzzy subsethood, fuzzy implication, and causality. In *Proceedings JCIS 2007*, 2007.
- [50] Mary K. Dobransky and Mark J. Wierman. An empirical study of search algorithms applied to a reconstructability analysis. In *ICCS 2006*. Boston, MA, 2006.
- [51] William J. Tastle and Mark J. Wierman. Adjusting the consensus measure to target ordinal scale arguments. In *NAFIPS 2006*. Montreal, Canada, 2006.
- [52] Mark J. Wierman and William J. Tastle. Placing the dissonance measure in the context of generalized information theory. In *NAFIPS 2006*. Montreal, Canada, 2006.
- [53] William J. Tastle and Mark J. Wierman. Consensus and dissension: A new measure of agreement. In *NAFIPS 2005*. Ann Arbor, MI, 2005.
- [54] William J. Tastle and Mark J. Wierman. An objective measure of consensus: Measuring behavior. In *Conference CD Wageningen: Noldus Information Technology*, 2005.
- [55] Mark J. Wierman and William J. Tastle. Consensus and dissension: Theory and properties. In *NAFIPS 2005*. Ann Arbor, MI, 2005.
- [56] Mark J. Wierman. Yet another axiomization of fuzzy set theory. In Ellen Walker, editor, *NAFIPS 2004*, pages 67–72, 2004.
- [57] Scott Lancaster and Mark J. Wierman. An empirical study of defuzzification methods. In *Proc. NAFIPS 2003*, pages 1179–1188, 2003.

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- [59] Mark J. Wierman. Dempster \neq shafer. In *JCIS 2002*, 2002.
- [60] Mark J. Wierman. Measuring conflict in evidence theory. In *Proceedings of Joint 9th IFSA Congress and 20th NAFIPS International Conference*, pages 1741–1745, 2001.
- [61] Mark J. Wierman. Uncertainty and subnormal possibility distributions. In *Proceedings of NAFIPS*, pages 313–316, 1999.
- [62] Mary K. Dobransky and Mark J. Wierman. Genetic algorithms and reconstructability analysis. In *2nd Workshop of IIGSS*, 1998.
- [63] Mark J. Wierman. The lattice of covers and partitions of a finite set under rough-exact ordering. In *Proceedings JCIS 1998*, pages 52–55, 1998.
- [64] Mark J. Wierman. From fuzzy sets to crisp sets. In *Proceedings JCIS 1997*, pages 9–12, 1997.
- [65] Mark J. Wierman. Total extension of set functions and relations. In *Proceedings NAFIPS 1997*, pages 292–294, 1997.
- [66] Mark J. Wierman. Central values of fuzzy numbers. In *Proceedings JCIS 1996*, pages 328–331, 1996.
- [67] John N. Mordeson and Mark J. Wierman. Differentiation of fuzzy functions. In *Proceedings NAFIPS 1997*, pages 295–298, 1996.
- [68] Mark J. Wierman. Possibilistic image processing. In D.P. Casasent, editor, *Intelligent Robots and Computer Visions X: Algorithms and Techniques, Proc. SPIE 1607*, pages 446–456, 1992.

EDITORIAL WORK

- Editorial Board Member of the International Journal of General Systems
- Paper Chair and Co-Proceedings Editor for 2008-2011 NAFIPS Conferences
- Co-Editor of the Critical Review of the Society for the Mathematics of Uncertainty (2008-2011)
- Journals and Conferences for which I regularly review papers include:
 1. International Journal of Approximate Reasoning
 2. International Journal of General Systems
 3. IEEE Transactions on Fuzzy Sets
 4. ISECON
 5. Information Science
 6. Fuzzy Sets and Systems
 7. NAFIPS

RESEARCH

My general field of research specialization is modeling and simulation. As an undergraduate, the modeling and simulation was accomplished with differential equations. As a graduate student this modeling and simulation was done with queues, linear equations, differential equations, finite state machines, statistical methods, fuzzy sets, and pure numerical techniques.

Much of my post-graduate research focused on the various models that have been devised to represent systems that contain uncertainty. These theories include: probability, fuzzy sets, possibility, evidence, and rough sets. In 1998, I collaborated on a book, about the properties and applications of measures of information in all of these different theories.

Over the past five years, my research has been focused primarily in two different areas. The first area (in collaboration with William J. Tastle) explores ways to assess consensus, dissent, and agreement, especially in ordinal data (such as the Likert Scale). We have developed measures of dissent and agreement, that have relevant mathematical properties, and applied them in various fields such as student evaluation and risk management.

The second area (in collaboration with John N. Mordeson, Terry C. Clark and a host of students) explores the application of Fuzzy Set Theory to mathematical models in Political Science. We have published a book as well as articles in major journals. We have also formed strong ties with the Society for the Mathematics of Uncertainty.

PROFESSIONAL SERVICE

- AP Reader Computer Science (2006)
- Member of Center for the Mathematics of Uncertainty (1996-Present)
- Member of North American Fuzzy Information Processing Society (1996-Present)