Sommer Elizabeth Gentry

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Current Appointments:

1. **Associate Professor**, Mathematics Department, United States Naval Academy, Annapolis, Maryland

2. **Research Associate**, Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland

Education:

1. **Massachusetts Institute of Technology -** Ph.D. Electrical Engineering and Computer Science, 2005

2. **Stanford University -** M.S. Engineering-Economic Systems and Operations Research, 1998

3. **Stanford University -** B.S. Mathematical and Computational Sciences, 1998

Awards:

1. **Mathematical Association of America Henry L. Alder Award for Distinguished Teaching by a Beginning Faculty Member, 2009**

2. Top Ten Abstracts award, American Society of Transplant Surgeons Winter Symposium, January 2009

3. Computational Science Graduate Fellows essay contest, awarded for excellence in technical writing that effectively communicates computational science to a lay audience, 2008

4. Faculty Special Act recognition award, U.S. Naval Academy, September 2006

5. UNOS Transplant Management Forum Abstract Award, Transplant center initiatives to increase donation, April 2005

6. U.S. Department of Energy Computational Science Graduate Fellowship, 2001-2005

7. Best Student Paper, IEEE Systems, Man, Cybernetics Conference, 2003

Research Areas:

Operations research, simulation, graph theory and maximum edge weight matching as applied to kidney paired donation, transplantation and organ allocation, and biomechanics.

Media Coverage:

1. *Society for Industrial and Applied Mathematicians News*, December 2008.
2. *Science News*. "Kidney Matchmaking", Math Trek, August 28, 2007.
3. ***Reader's Digest***, "The Perfect Match", The Big Idea, March 2006.
4. ***Time Magazine***, "The Kidney Connection", Innovators, September 12, 2005.
5. ***Science***, Vol. 303, March 12, 2004, p. 1609.
6. ***The Diane Rehm Show***, National Public Radio, March 18, 2005.
7. *Baltimore Sun*, "By the Numb3rs", Health and Science, January 27, 2006.
8. *MIT Technology Review*, "Make Me a Match", March 2006.
9. *CBS WJZ Baltimore News,* TV interview, January 27, 2006.
10. *Boston Globe*, Health and Science C1, March 16, 2004.
11. *ScienCentral News*, TV news segment, March 23, 2004.
12. *MIT Technology Review*, "Dance Machine", June 2004, p. 5.
13. *Society for Industrial and Applied Mathematicians News*, December 2004.

Publications:

1. D. Segev, S. Gentry. Kidneys for sale: Whose attitudes matter? *American Journal of Transplantation*, 10(5): 1113-4, 2010.
2. S. Gentry, T.S. Michael, and D. Segev. Maximum matchings in graphs for kidney paired donation. In revision.
3. S. Gentry, R.A. Montgomery, B. Swihart, and D.Segev. The roles of dominos and nonsimultaneous chains in kidney paired donation. *American Journal of Transplantation*, 9(6): 1330-1336, May 2009.

4. D. Segev, L. Kucirka, S. Gentry, and R.A.Montgomery. Utilization and outcomes of kidney paired donation in the United States. *Transplantation*, 86(4):502-10, Aug 27 2008.

5. S. Gentry, D. Segev, and R.A. Montgomery. Working together towards a national kidney paired donation program. Letter, *American Journal of Transplantation* 8(3): 722, March 2008.

6. S. Gentry, D. Segev, M. Simmerling, and R.A. Montgomery. Expanding kidney paired donation through participation by compatible pairs. *American Journal of Transplantation* 7(10): 2361-2370, 2007.

7. D. Segev, S. Gentry, R.A. Montgomery. Association between waiting times for kidney transplantation and rates of live donation. *American Journal of Transplantation* 7(10): 2406-2413*,* October 2007.

8. S. Gentry. Practitioner's Commentary: The outstanding kidney exchange papers. *UMAP Journal* 28.2, Summer 2007.

9. S. Gentry. Optimization over graphs for kidney paired donation. Chapter in *Optimization in Medicine and Biology*, edited by Gino Lim, 2008.

10. E.S. Woodle, Y. Miao, D. Goldfarb, D. Segev, S. Gentry, A. Waterman, M. Aeder, R.M. Lewis, R. Shapiro. Kidney paired donation: State of the science and practice. Invited review article, *Current Opinion in Organ Transplantation* 12(4):384-389, August 2007.

11. C. E. Simpkins, R. A. Montgomery, A. M. Hawxby, J. E. Locke, S. E. Gentry, D. S. Warren, D. L. Segev. Cold ischemia time and allograft outcomes in live donor renal transplantation: is live donor organ transport feasible? *American Journal of Transplantation*. 7(1):99-107, Jan 2007.

12. R.A. Montgomery, S. Gentry, W.H. Marks, D.S. Warren, J. Hiller, J. Houp, A.A. Zachary, J.K. Melancon, W.R. Maley, H. Rabb, C.E. Simpkins, and D. Segev. Domino paired kidney donation: a strategy to make best use of live non-directed donation. *Lancet*, vol. 268, p. 419-421, 2006.

13. D. Segev, S. Gentry, D. Warren, B. Reeb, and R.A. Montgomery. Kidney paired donation: Optimizing the use of live donor organs. *Journal of the American Medical Association,* vol. 293, p. 1883-1890, 2005*.*

14. S. Gentry, D. Segev, and R.A. Montgomery. A comparison of populations served by kidney paired donation and list donation. *American Journal of Transplantation*, 2005, August, 5(8): 1914-21.

15. D. Segev, S. Gentry, J.K. Melancon, and R.A. Montgomery. Characterization of waiting times in a simulation of kidney paired donation. *American Journal of Transplantation,* 2005, October 5(10): 2448-55.

16. D. Segev, S. Gentry, and R.A. Montgomery. Relative roles for list paired exchange, live donor paired exchange, and desensitization. *American Journal of Transplantation,* 2006, February, 6(2): 437.

17. S. Gentry, R. Murray-Smith, and E. Feron. Human-human haptic collaboration on a cyclical Fitts' task. *IEEE/RSJ International Conference on Intelligent Robots and Systems*, August 2005.

18. S. Gentry and E. Feron. Musicality experiments in lead and follow dance. *IEEE Systems, Man and Cybernetics Conference*, October 2004, 4: 984-8.

19. S. Gentry and E. Feron. Modeling musically meaningful choreography. *IEEE Systems, Man and Cybernetics Conference*, October 2004, 4: 3880-5.

20. E. Hsu, S. Gentry, and J. Popovic. Example-based control of human motion. *Eurographics / ACM SIGGRAPH Symposium on Computer Animation*, 2004, 69-77.

21. S. Gentry and R. Murray-Smith. Haptic dancing: human performance at haptic decoding with a vocabulary. *IEEE Systems, Man, Cybernetics Conference,* 2003, 4: 3432-7. Student Best Paper award.

22. S. Gentry, S. Wall, I. Oakley and and R. Murray-Smith. Got Rhythm? Haptic-only lead and follow dancing. *Proceedings of Eurohaptics*, Dublin, Ireland, p. 481-488, July 2003.

23. V. Kulkarni and S. Gentry. Optimal Mode Changes for Highway Transportation Safety. *IEEE Systems, Man, Cybernetics Conference,* 2003, 2: 1235-40.

24. J. De Mot, V. Kulkarni, S.Gentry and E. Feron**.** Spatial Distribution Results for Efficient Multi-Agent Navigation. *IEEE Conference on Decision and Control,* 2002, 4: 3776-81*.*

25. J. De Mot, V. Kulkarni, S.Gentry,V. Gavrilets and E. Feron. Coordinated Path Planning for a UAV Cluster. *The First AINS Symposium*, UCLA, Los Angeles, CA, May 2002.

26. S. Gentry. Partial Inverse Optimization. *MIT Lab for Information and Decision Systems Report, LIDS-P-2532*, December, 2001.

27. S. Gentry, V. Saligrama and E. Feron. Dynamic Inverse Optimization. *Proceedings of American Control Conference*, Volume 6, p. 4722-7, 2001.

28. S. Gentry, S. Venkatesh and E. Feron**.** Identifying Constrained Receding Horizon Controllers. *Allerton Control Conference* at UIUC, 2000.

Presentations:

1. Faster, Safer, Healthier with Operations Research. Mathematical Association of America's Lecture for Students, Mathfest, Pittsburgh, August 7, 2010.

2. CAPABLE (Calculus Acquisition through a Problem and Activity Based Learning Experience). Joint Mathematics Meetings, San Francisco, January 13, 2009.

3. Mathematical aspects of organ transplantation. Mathematics Department Faculty-Student Colloquium, Longwood University, Farmville, VA, January 28, 2009.

4. Maximum matching on weighted graphs for increasing live donor kidney transplantation. Control systems and biomedical engineering joint seminar, Georgia Tech, Atlanta, GA, September 18, 2009.

5. Computing for kidney paired donation, and vice versa. Advanced Scientific Computing Advisory Council meeting, American Geophysical Union, Washington D.C., August 11, 2009.

6. Math that matters. Alder Award recipients session talk, Mathfest, Portland, OR, August 7, 2009.

7. Graphs for increasing organ transplantation. Pi Day Lecture, University of Maryland Baltimore County, March 13, 2009.

8. Influencing policy with simulation and increasing transplantation with optimization. Society of Industrial and Applied Mathematicians Conference on Computational Science and Engineering, March 2, 2009.

9. Role of dominos and neverending altruistic donor chains in kidney paired donation. American Society of Transplant Surgeons Winter Symposium, Top Ten Abstracts award, January 16, 2009.

10. Operations Management in Healthcare Seminar guest speaker. Wharton School of Business, Philadelphia, April 24 and November 20, 2008.

11. Optimizing kidney paired donations. Invited speaker, New York Organ Donor Network meeting at the New York Academy of Medicine, December 13, 2007.

12. Two results about the size of weighted matchings, with applications to kidney paired donation. Institute for Operations Research and Management Science annual meeting, November 4, 2007.

13. Models, algorithms and information technology requirements for a national kidney paired donation matching system. United Network for Organ Sharing, Richmond Virginia, September 12, 2007.

14. Optimal weighted and stable matchings on graphs for increasing live donor kidney transplantation. Mathematical Association of America, Mathfest, San Jose, CA, August 5, 2007.

15. Canada's stake in kidney paired donation. Science panel speaker, Kidney Foundation of Canada, Halifax, Canada, June 8, 2007.

16. Optimization and impact of kidney paired donation in Canada. Plenary presentation, Canadian Society for Transplantation's annual meeting, Banff, Canada, March 17, 2007.

17. Network optimization in medicine: the case of kidney paired donation. University of Maryland College Park Smith School of Business, March 6, 2007.

18. Combinatorial optimization in medicine: the case of kidney paired donation. U.S. Naval Academy Computer Science departmental seminar, February 14, 2007.

19. Optimizing kidney paired donation. Presented at Naval Postgraduate Dental School faculty retreat, Annapolis, MD, January 17, 2007.

20. Maximum matchings on graphs for kidney paired donation. INFORMS annual meeting, Pittsburgh, November 2007.

21. Matching on graphs for making the most of living kidney donors. Stanford University Management Science and Engineering departmental seminar on decision-making in medicine, October 23, 2006.

22. Science of swing dancing, children's program, West County Library, August 2006.

23. Maximum matchings on graphs for kidney paired donation. Johns Hopkins University Applied Mathematics and Statistics departmental seminar, Baltimore, April 6, 2006.

24. Maximum matching inequalities for kidney paired donation. *INFORMS Conference on Optimization and Health Care*, San Antonio, February 3, 2006.

25. Mathematical optimization for physicians and transplant professionals. Invited lecture, Institute for the Study of Health, University of Cincinnati School of Medicine, September 26, 2005.

26. Maximizing kidney paired donation. *Computational Research in Boston* seminar, Massachusetts Institute of Technology, September 2, 2005.

27. Maximizing paired kidney exchange: algorithm and simulations. *UNOS Thirteenth Annual Transplant Management Forum*, April 12, 2005.

28. Maximal matching to optimize and customize paired kidney exchange. Plenary talk, *Live Donor Paired Kidney Donation Consensus Meeting*, March 2, 2005.

29. *Supercomputing 2004*, Student Days Young Researcher Panel, November 9, 2004.

30. Haptic dancing. *New England chapter of the Human Factors and Ergonomics Society Student Conference*, Tufts University, November 12, 2003.

31. Identifying constrained receding horizon controllers. *Society for Industrial and Applied Mathematicians Annual Meeting and Conference on Control*, July 2001.

Grants:

1. Reducing geographic disparity in transplant access: Clinical and economic impact, National Institutes of Health Challenge Grant, 2009-2011.
2. Decreasing waits for kidney paired donation using realtime matching strategies, National Kidney Foundation of Maryland Scientific Research Grant, 2010.
3. Clinical tools for kidney paired donation, Johns Hopkins Hospital Comprehensive Transplant Center, 2009.
4. Naval Academy Research Council grants, 2006, 2007, and 2008.

Industry Experience:

1. Sandia National Labs visiting researcher, 2003

2. Lawrence Livermore National Labs Systems Sciences Engineer, 1998-1999
3. Internships: Microsoft Corporation, Providian Bancorp, Trilogy Development Group.

Service:

1. Developed and donated software for optimized kidney paired donation matching which is used for national registries in Canada and the United States.
2. At-large representative to United Network for Organ Sharing's Kidney-Pancreas Committee and Kidney Paired Donation subcommittee
3. Mathematical Association of America Alder Awards Committee
4. Department of Energy Computational Science Graduate Fellowship Selection Committee
5. Chair, Math Department Recruitment Committee, 2009-present
6. Math Department Post-Core Curriculum Committee, 2008-present
7. Quantitative Economics Steering Committee, 2008-present
8. Math Department Core Curriculum Committee, 2007
9. Naval Academy Public Affairs Office Speakers Bureau
10. Faculty Adviser, Naval Academy Swing Dance ECA

Professional Memberships:

1. American Society of Transplant Surgeons (ASTS, non-physician scientist)
2. Institute for Operations Research and Management Science (INFORMS)
3. Society for Industrial and Applied Mathematics (SIAM)
4. Mathematical Association of America (MAA)