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Education

Ph.D. in Computer and Information Science - 2005 - University of Oregon, Eugene, Oregon
• Dissertation: *Discrete Global Grid Systems: A New Class of Geospatial Data Structures*

M.S. in Computer Science - 1995 - University of Colorado at Colorado Springs, Colorado
• Thesis: *A Novel Approach to Inverse Kinematics for Positioning Realistic Animated Human Agents*
• Specialization in Space Operations

B.A. in Mathematics and Philosophy - 1984 - Bucknell University, Lewisburg, Pennsylvania
• Army ROTC Full Four-Year Scholarship recipient
• Distinguished Military Graduate

Experience

Associate Professor, Southern Oregon University, 2000 - present

Contract Programmer/Consultant, 1989 - Present

Research Assistant/Programmer, Oregon State University, 1993 - 2000

Software Engineer, CAE-Link Corporation, 1992 - 1993

Associate Programmer/Analyst, Kaman Sciences Corporation, 1989 - 1992

Programmer/Consultant, Renaissance Computerware, Inc., 1988 - 1989

Military Intelligence Officer, U.S. Army, 1984 - 1988

Major Funded Contracts and Grants

2010. Principal Researcher, "Grid Generation for EPA Emergency Response Applications," US Environmental Protection Agency Contract #EP-11-W-000071.

2007 - 2009. Principal Researcher, "ISEA grid applications for earth observations," European Space Agency contract #20344/06/I-LG.

2003 - 2009. Principal Investigator, "Sponsored research on ISEA3H data structures," cooperative research agreement between GRIDS, Limited and Southern Oregon University.

2004. Consultant, "Development of multi-scale discrete global simulation testbed," USDA Forest Service contract #40-05GG-4-0087.

2003 - 2004. Principal Researcher, "Virtual globe project," Canadian Space Agency contract #9F028-2-4917/03.

2002. Researcher, Canadian National Research Council Industrial Research Assistance Program (NRC-IRAP) grant #447015 (extension) to GRIDS, Limited.

2000-2002. Consultant, "Development of discrete global grid software for survey grid generation," US Environmental Protection Agency Contract #1B0250NATA.

2001. Consultant, NRC-IRAP grant #447015 to GRIDS, Limited.

2001. Consultant, NRC-IRAP grant #475708 to GRIDS, Limited.

1993-1997. Research Assistant, "Geographic analysis of habitat and species biological diversity," USDA Forest Service cooperative agreement PNW 92-0283 with Oregon State University.

1993-1996. Research Assistant, "Sampling design and statistics research for EMAP: Development of global sampling grid," US Environmental Protection Agency cooperative agreement CR821672 with Oregon State University.

Publications

2011. Sahr, K. Hexagonal discrete global grid systems for geospatial computing. *Archives of Photogrammetry, Cartography and Remote Sensing*, 22:363-376.

2008. Sahr, K. Location coding on icosahedral aperture 3 hexagon discrete global grids. *Computers, Environment and Urban Systems*, 32(3):174-187.

2008. Kiester, A.R., and K. Sahr. Introduction to discrete global grids. *Computers, Environment and Urban Systems*, 32(3):173.

2008. Kiester, A.R., and K. Sahr. Planar and spherical hierarchical, multi-resolution cellular automata. *Computers, Environment and Urban Systems*, 32(3):204 - 213.

2008. Gregory, M., A.J. Kimerling, D. White, and K. Sahr. A comparison of intercell metrics on discrete global grid systems. *Computers, Environment and Urban Systems*, 32(3):188-203.

2005. Sahr, K. Apply discrete global grids for global datasets. *GEO World*, April, 2005.

2003. Sahr, K., D. White, and A.J. Kimerling. Geodesic discrete global grid systems. *Cartography and Geographic Information Science*, 30(2):121-134.

2002. Song, L., A. J. Kimerling, and K. Sahr. Developing an equal area global grid by small circle subdivision. In: M.F. Goodchild, and A.J. Kimerling (eds.), *Discrete global grids: A web book*, University of California, Santa Barbara.

1999. Kimerling, A.J., K. Sahr, D. White, and L. Song. Comparing geometrical properties of discrete global grids. *Cartography and Geographic Information Systems*, 26(4):271-288.

1998. Sahr K., and D. White. Discrete global grid systems. *Proceedings of the 30th Symposium on the Interface*, Computing Science and Statistics 30, pp. 269-278.

1998. White D., A.J. Kimerling, K. Sahr, and L Song. Comparing area and shape distortion on polyhedral-based recursive partitions of the sphere. *International Journal of Geographical Information Science*, 12(8):805-827.

1997. Carr, D., R. Kahn, K. Sahr, and A. Olsen. ISEA Discrete Global Grids. *Statistical Computing & Graphics Newsletter*, 8(2/3):31-39.

1997. Kimerling, A.J., K. Sahr, and D. White. Global scale data model comparison. *Proceedings, Auto-Carto 13*, American Congress on Surveying and Mapping, pp. 357-366.

1997. Arthur, J., M. Hachey, K. Sahr, M. Huso, and A.R. Kiester. Finding all optimal solutions to the reserve site selection problem: formulation and computational analysis. *Environmental and Ecological Statistics*, 4:153-165.

1997. Csuti, B., S. Polasky, P.H. Williams, R. Pressey, J. Camm, M. Kershaw, A.R. Kiester, B. Downs, R. Hamilton, M. Huso, and K. Sahr. A comparison of reserve selection algorithms using data on terrestrial vertebrates in Oregon. *Biological Conservation*, 80:83- 97.

1996. Kiester A.R., J.M. Scott, B. Csuti, R. Noss, B. Butterfield, K. Sahr, and D. White. Conservation prioritization using GAP data. *Conservation Biology*, 10(5):1332-1342.

Presentations

2011. White, D., and K. Sahr. The topology of connectivity: lessons from community ecology neutral models, cellular automata, and image processing. *Biology Seminar Series*, Carleton University, Ottawa, Canada.

2011. Sahr, K. Potential mobile mapping applications of hexagonal discrete global grid systems. Poster presented at the *7th International Symposium on Mobile Mapping Technology*, Krakow, Poland.
2010. Sahr, K. What's wrong with Google Earth? New approaches to the representation of location on computers. *Southern Oregon Arts and Research Symposium*, Ashland, Oregon.
2004. Sahr, K. Spatial indexing on icosahedral aperture 3 discrete global grids. *Second International Conference on Discrete Global Grids*, Ashland, Oregon.
2004. Kiester, A.R., and K. Sahr. Spatially hierarchical cellular automata on discrete global grids. *Second International Conference on Discrete Global Grids*, Ashland, Oregon.
2004. Kimerling, A.J., and K. Sahr. Using data loss and duplication maps as tools for comparing data use when resampling from equal-angle, hexagonal, and triangular discrete global grids. *Second International Conference on Discrete Global Grids*, Ashland, Oregon.
2004. Gregory, M., A.J. Kimerling, D. White, and K. Sahr. Evaluating desirable geometric characteristics of discrete global grid systems: Revisiting the Goodchild criteria. *Second International Conference on Discrete Global Grids*, Ashland, OR.
2004. Sahr, K. Developing software for discrete global grids. *GeoTec 2004*, Toronto, Canada.
2001. Sahr, K. Discrete Global Grid Systems: A New Class of Geospatial Data Structures. *Friday Science Seminar Series*, Southern Oregon University, Ashland, Oregon.
2000. Sahr, K. A preliminary comparison of proposed topologies for geodesic discrete global grid systems. *First International Conference on Discrete Global Grids*, Santa Barbara, California.
2000. Kiester, A.R., and K. Sahr. Unexpected and complex behavior of hierarchical, multiresolution cellular automata. *First International Conference on Discrete Global Grids*, Santa Barbara, California.
2000. Gregory, M., A.J. Kimerling, D. White, and K. Sahr. Comparing intercell distance and cell wall midpoint criteria for Discrete Global Grid Systems. *First International Conference on Discrete Global Grids*, Santa Barbara, California.
1998. Sahr K., and D. White. Discrete global grid systems. *30th Symposium on the Interface: Computing Science and Statistics*, Minneapolis, Minnesota.
1997. Sahr, K. Discrete Global Grids. *Milton Harris Seminar*, Oregon State University, Corvallis, Oregon.

1997. Csuti, B., P. Kennelly, S.M. Meyers, and K. Sahr. Current status of biodiversity indicators using GIS. *1997 ESRI User Conference*, San Diego, California.

1997. Kimerling, A.J., K. Sahr, and D. White. Global scale data model comparison. *Auto-Carto 13*, Seattle, Washington.

Patents

US Patent #07,876,967, *Icosahedral Modified Generalized Balanced Ternary and Aperture 3 Hexagon Tree*, awarded January 25, 2011.

US Patent Application #2010/054550, *Central Place Indexing Systems*.