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EDUCATIONAL AND PROFESSIONAL HISTORY

Education

1977-1987	Ph.D., Geography, University of Illinois at Urbana-Champaign
1975-1977	M.A., Geography, University of North Carolina at Charlotte
1970-1974	B.A., Geography, State University of New York at Plattsburgh

Positions and Appointments (Unless otherwise indicated, at The University of Iowa)

2017-	Associate Dean for Research and Infrastructure, CLAS
2018 (Summer)	Interim Director, Office of Sustainability and the Environment
2017-2018	Interim Director, Optical Science and Technology Center
2014-2016	Associate Dean for Graduate and Online Education, CLAS
2012-2014	Interim Chair, Department of Cinema and Comparative Literature
2011-2013	Interim Chair, Department of Communication Studies
2010-2011	Interim Director, Division of World Languages, Literatures, and Cultures
2010-2011	Interim Chair, Department of Asian and Slavic Languages and Literatures
2007-2009	Interim Director, School of Journalism and Mass Communication
2006 (Fall)	Interim Associate Dean for Research, CLAS
2005-2010	Administrative Fellow, CLAS
2000-2012	Chair, Department of Geography
1998-	Professor, Dept of Geographical and Sustainability Sciences, Graduate Program in Applied Math and Computational Sciences, & Graduate Program in Informatics
1991-1998	Associate Professor, Department of Geography and Graduate Program in Applied Mathematical and Computational Sciences
1984-1991	Assistant Professor, Departments of Geography and Computer Science
1981-1984	Research Programmer, Department of Landscape Architecture, University of Illinois
1980-1981	Research Data Analyst, Survey Research Laboratory, University of Illinois
1975-1980	Teaching Assistant, UNC-Charlotte and University of Illinois
1974-1975	Cartography Instructor/Cartographer, W.H. Miner Center, SUNY at Plattsburgh

SCHOLARSHIP

Google Scholar: <https://scholar.google.com/citations?user=0xaenwsAAAAJ&hl=en>

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Publications

Monographs

- 2017** Editor-in-Chief: D. Richardson; General Editors: N. Castree, M. F. Goodchild, A. Kobayashi, W. Liu, R. A. Marston; Section Editors: M. Armstrong, D. Butler, F. Collins, P. Daniels, D. Demeritt, M. Dunford, S. Eden, K. Foote, C. He, A. Jeffrey, R. Kearns, L. Kong, M-P. Kwan, H. Lin, W. Liu, S. Luzzadder-Beach, G. Malanson, S. Manson, J. Murphy, A. Nayak, D. O’Sullivan, A. Paasi, L. Peake, M. Pelling, G. Pratt, J-P. Rodrigue, R. Schaeztl, R. Schroeder, M. Shepherd, E. Sheppard, M. Stoffel, M-H. Tsou, D. Wilson, G. Wilson, and M. Yuan. *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. New York, NY: John Wiley. ISBN: 978-1118786352, DOI: 10.1002/9781118786352
- 2008:** Rushton, G., Armstrong, M.P., Gittler, J., Greene, B.R., Pavlik, C.E., West, M.M., and Zimmerman, D.L. (editors) *Geocoding Health Data*. Boca Raton, FL: CRC Press. ISBN: 978-0849384196
- 2007:** National Research Council. (Committee on Confidentiality of Linked Social-Spatial Information: Gutmann, M., Stern, P., Armstrong, M.P., Balk, D., Green, K., Levine, F., Onsrud, H., Reiter, J., and Rindfuss, R.) *Putting People on the Map: Protecting Confidentiality with Linked Social-Spatial Data*. Washington, DC: The National Academies Press. ISBN: 978-0309104142
- 2006:** National Research Council. (Committee on Basic and Applied Research Priorities in Geospatial Science for the National Geospatial-Intelligence Agency: Clarke, K.C., Armstrong, M.P., Bhaduri, B.L., Battenfield, B.P., Gahegan, M.N., Jackson, M.J., Shekar, S., and Tucker, C.) *Priorities for GEOINT Research at the National Geospatial-Intelligence Agency*. Washington, DC: The National Academies Press. ISBN: 978-0309104143
- 1997:** Armstrong, M.P., Rushton, G., Chakraborty, J., Ibaugh, A., and Ruggles, A. *Spatial Data Systems for Transportation Planning*. Iowa City, IA: Public Policy Center, University of Iowa. ISBN: 978-0874141405 (http://ir.uiowa.edu/cgi/viewcontent.cgi?article=1012&context=ppc_transportation)

Journal Articles: Refereed

- 2019:** Armstrong, M.P. U.S. Census Bureau Area Measurements for Sub-County Areas and Clarence Batschelet’s U.S. Population Density Map of 1942. Forthcoming, *Imago Mundi: The International Journal for the History of Cartography*.
- 2018:** Armstrong, M.P. Active symbolism: Towards a new theoretical paradigm for statistical cartography. Published online (13 September 2018), *Cartography and Geographic Information Science*. <https://doi.org/10.1080/15230406.2018.1509733>

Armstrong, M.P., Wang, S., and Zhang, Z. The Internet of Things and fast data streams: Prospects for geospatial data science in emerging information ecosystems. Published online

(13 September 2018), *Cartography and Geographic Information Science*.
<https://doi.org/10.1080/15230406.2018.1503973>

Armstrong, M.P. How large is Aroostook County? Exploring the historical mutability of U.S. county area measurements. *Cartography and Geographic Information Science*, **45**(5): 438-455. <http://dx.doi.org/10.1080/15230406.2017.1370392>

Armstrong, M.P. and Xiao, N. Retrospective deconstruction of statistical maps: a choropleth case study. *Annals of the American Association of Geographers*, **108** (1): 179-203.
<http://www.tandfonline.com/doi/full/10.1080/24694452.2017.1356698>

2014: Hegeman, J.W., Sardeshmukh, V.B, Sugumaran, R. and Armstrong, M.P. Distributed LiDAR data processing in a high-memory cloud-computing environment. *Annals of GIS*, **20** (4): 255-264. <http://dx.doi.org/10.1080/19475683.2014.923046>

2012: Xiao, N. and Armstrong, M.P. Towards a multiobjective view of cartographic design. *Cartography and Geographic Information Science*, **39** (2): 76-87.
<http://dx.doi.org/10.1559/1523040639276>

2009: Wang, S. and Armstrong, M.P. A theoretical approach to the use of cyberinfrastructure in geographical analysis. *International Journal of Geographical Information Science* **23** (2): 169-193. <http://dx.doi.org/10.1080/13658810801918509>

Haynes, D. and Armstrong, M.P. Population reallocation methods to support emergency evacuation planning. *Earthzine* (An online publication of the IEEE Committee on Earth Observation. <https://earthzine.org/2009/03/16/population-reallocation-methods-to-support-emergency-evacuation-planning/>

2008: Zhang, X. and Armstrong, M.P. Genetic algorithms and the corridor location problem: Multiple objectives and alternative solutions. *Environment and Planning B: Planning and Design* **35** (1): 148-168. <http://dx.doi.org/10.1068/b32167>

Armstrong, M.P. and Densham, P.J. Cartographic support for locational problem-solving by groups. *International Journal of Geographical Information Science* **22** (7): 721-749.
<http://dx.doi.org/10.1080/13658810701602252>

Wang, S., Cowles, M. K., and Armstrong, M. P. Grid computing of spatial statistics: using the TeraGrid for $G_i^*(d)$ analysis. *Concurrency and Computation: Practice and Experience* **20** (14): 1697-1720. <http://dx.doi.org/10.1002/cpe.1294>

2007: Xiao, N., Calder, C., and Armstrong, M.P. Assessing the effect of attribute uncertainty on the robustness of choropleth map classification. *International Journal of Geographical Information Science* **21** (2): 121-144. <http://dx.doi.org/10.1080/13658810600894307>

Xiao, N. Bennett, D.A. and Armstrong, M.P. Interactive evolutionary approaches to multiobjective spatial decision making: a synthetic review. *Computers, Environment and Urban Systems* **31** (3): 232-252. <https://doi.org/10.1016/j.compenvurbsys.2006.08.001>

Yan, J., Cowles, M. K., Wang, S. and Armstrong, M.P. Parallelizing MCMC for Bayesian spatiotemporal geostatistical models. *Statistics and Computing* **17** (4): 323-335.
<https://link.springer.com/article/10.1007%2Fs11222-007-9022-2>

- 2006:** Rushton, G., Armstrong, M.P., Gittler, J., Greene, B., Pavlik, C.E., West, M. and Zimmerman, D. Geocoding in cancer research: A review. *American Journal of Preventive Medicine* **30** (2, Supplement 1): S16-S24. <https://doi.org/10.1016/j.amepre.2005.09.011>
- Xiao, N. and Armstrong, M.P. ChoroWare: A software toolkit for choropleth map classification. *Geographical Analysis* **38** (1): 102-121. <https://doi.org/10.1111/j.0016-7363.2005.00678.x>
- Armstrong, M.P. The Illinois Resource Information System: Early innovations in geographic information systems design. *Cartography and Geographic Information Science* **33** (2): 97-114. <https://doi.org/10.1559/152304006777681689>
- 2005:** Armstrong, M.P., Wang, S., and Cowles, M. Using a computational grid for geographic information analysis. *The Professional Geographer* **57**(3): 365-375. <https://doi.org/10.1111/j.0033-0124.2005.00484.x>
- Armstrong, M.P. and Bennett, D.A. A manifesto on mobile computing for geographic education. *The Professional Geographer* **57**(4): 506-515. <https://doi.org/10.1111/j.1467-9272.2005.00495.x>
- Xiao, N. and Armstrong, M.P. Exploring the visual correlation of choropleth maps using an evolutionary algorithm. *Cartography and Geographic Information Science* **32**(4): 347-358. <https://doi.org/10.1559/152304005775194755>
- Armstrong, M.P. and Ruggles, A. Geographic information technologies and personal privacy. *Cartographica* **40** (4): 63-73. <https://doi.org/10.3138/RU65-81R3-0W75-8V21>
- 2004:** Bennett, D.A., Xiao, N., and Armstrong, M.P. Exploring the geographic consequences of public policies using evolutionary algorithms. *Annals of the Association of American Geographers* **94** (4): 827-847. <https://doi.org/10.1111/j.1467-8306.2004.00437.x>
- 2003:** Wang, S. and Armstrong, M.P. A quadtree approach to domain decomposition for spatial interpolation in grid computing environments. *Parallel Computing* **29** (10): 1481-1504. <https://doi.org/10.1016/j.parco.2003.04.003>
- Armstrong, M.P., Xiao, N. and Bennett, D.A. Using genetic algorithms to create multicriteria class intervals for choropleth maps. *Annals of the Association of American Geographers* **93** (3) 595-623. <https://doi.org/10.1111/1467-8306.9303005>
- 2002:** Xiao, N., Bennett, D.A. and Armstrong, M.P. Using evolutionary algorithms to generate alternatives for multiobjective site-search problems. *Environment and Planning A* **34** (4): 639-656. <https://doi.org/10.1068/a34109>
- Armstrong, M.P. Geographic information technologies and their potentially erosive effects on personal privacy. *Studies in the Social Sciences* **27** (1): 19-28.
- 2001:** Chakraborty, J. and Armstrong, M.P. Assessing the impact of airborne toxic releases on populations with special needs. *The Professional Geographer* **53** (1): 119-131. DOI: [10.1111/0033-0124.00274](https://doi.org/10.1111/0033-0124.00274)

- 2000:** Armstrong, M.P. Geography and computational science. *Annals of the Association of American Geographers* **90** (1): 146-156. <https://doi.org/10.1111/0004-5608.00190>
- 1999:** Cramer, B.E and Armstrong, M.P. An evaluation of domain decomposition strategies for parallel spatial interpolation of surfaces. *Geographical Analysis* **31** (2): 148-168. <https://doi.org/10.1111/j.1538-4632.1999.tb00974.x>
- Zimmerman, D., Pavlik, C.E., Ruggles, A. and Armstrong, M.P. An experimental comparison of ordinary and universal kriging and inverse distance weighting. *Mathematical Geology* **31** (4): 375-390. <https://doi.org/10.1023/A:1007586507433>
- Armstrong, M.P., Rushton, G. and Zimmerman, D.L. Geographically masking health data to preserve confidentiality. *Statistics in Medicine* **18** (5): 497-525. <https://onlinelibrary.wiley.com/doi/abs/10.1002/%28SICI%291097-0258%2819990315%2918%3A5%3C497%3A%3AAID-SIM45%3E3.0.CO%3B2-%23>
- Bennett, D.A., Wade, G.A. and Armstrong, M.P. Exploring the solution space of semi-structured geographical problems using genetic algorithms. *Transactions in GIS* **3** (1): 51-71. <https://doi.org/10.1111/1467-9671.00006>
- 1998:** Rokos, D. Kl. and Armstrong, M.P. Experiments in the identification and extraction of terrain features using a PC-based parallel computer. *Photogrammetric Engineering and Remote Sensing* **64** (2): 135-142. https://www.asprs.org/wp-content/uploads/pers/1998journal/feb/1998_feb_135-142.pdf
- Ruggles, A.J. and Armstrong, M.P. Toward a conceptual framework for the cartographic visualization of network information. *Cartographica* **34** (1): 33-48. <https://doi.org/10.3138/P854-U458-7R22-J13R>
- 1997:** Malanson, G.P. and Armstrong, M.P. Issues in spatial representation: effects of cell number and between-cell step size. *Geographical and Environmental Modelling* **1** (1): 47-64.
- Chakraborty, J. and Armstrong, M.P. Exploring the use of buffer analysis for the identification of impacted areas in environmental equity assessment. *Cartography and Geographic Information Systems* **24** (3): 145-157. <https://doi.org/10.1559/152304097782476951>
- Armstrong, M.P. and Marciano, R.J. Massively parallel strategies for local spatial interpolation. *Computers & Geosciences* **23** (8): 859-867. [https://doi.org/10.1016/S0098-3004\(97\)00058-7](https://doi.org/10.1016/S0098-3004(97)00058-7)
- 1996:** Bennett, D.A. and Armstrong, M.P. A knowledge based approach to topographic feature extraction. *Cartography and Geographic Information Systems* **23** (1): 3-19. <https://doi.org/10.1559/152304096782512177>
- Armstrong, M.P. and Marciano, R. Local interpolation using a distributed parallel supercomputer. *International Journal of Geographical Information Systems* **10** (6): 713-729.

Chakraborty, J. and Armstrong, M.P. Using geographic plume analysis to assess community vulnerability to hazardous accidents. *Computers, Environment and Urban Systems* **19** (5/6): 341-356. [https://doi.org/10.1016/0198-9715\(95\)00018-6](https://doi.org/10.1016/0198-9715(95)00018-6)

Rokos, D. and Armstrong, M.P. Using Linda to compute spatial autocorrelation in parallel. *Computers & Geosciences* **22** (5): 425-432. [https://doi.org/10.1016/0098-3004\(95\)00105-0](https://doi.org/10.1016/0098-3004(95)00105-0)

Malanson, G.P. and Armstrong, M.P. Dispersal probability and forest diversity in a fragmented landscape. *Ecological Modelling* **87**: 91-102. [https://doi.org/10.1016/0304-3800\(94\)00202-9](https://doi.org/10.1016/0304-3800(94)00202-9)

- 1995:** Armstrong, M.P. and Marciano, R. Massively parallel processing of spatial statistics. *International Journal of Geographical Information Systems* **9** (2): 169-189. <https://doi.org/10.1080/02693799508902032>

Rushton, G., Armstrong, M.P. and Lolonis, P. Small area student projections based on a modifiable spatial filter. *Socio-Economic Planning Sciences* **29** (3): 169-185. [https://doi.org/10.1016/0038-0121\(95\)00007-9](https://doi.org/10.1016/0038-0121(95)00007-9)

Armstrong, M.P. Is there a role for high performance computing in GIS? *Journal of the Urban and Regional Information Systems Association* **7** (1): 7-10. <http://www.urisa.org/clientuploads/directory/Documents/Journal/vol7no1.pdf>

- 1994:** Armstrong, M.P., Pavlik, C.E. and Marciano, R. Parallel processing of spatial statistics. *Computers & Geosciences* **20** (2): 91-104. [https://doi.org/10.1016/0098-3004\(94\)90001-9](https://doi.org/10.1016/0098-3004(94)90001-9)

Armstrong, M.P. and Marciano, R. Inverse distance weighted spatial interpolation using a parallel supercomputer. *Photogrammetric Engineering and Remote Sensing* **60** (10): 1097-1103. https://www.asprs.org/wp-content/uploads/pers/1994journal/sep/1994_sep_1097-1103.pdf

Armstrong, M.P. Requirements for the development of GIS-based group decision support systems. *Journal of the American Society for Information Science* **45** (9): 669-677. [https://doi.org/10.1002/\(SICI\)1097-4571\(199410\)45:9%3C669::AID-ASI4%3E3.0.CO;2-P](https://doi.org/10.1002/(SICI)1097-4571(199410)45:9%3C669::AID-ASI4%3E3.0.CO;2-P)

Armstrong, M.P., Pavlik, C.E. and Marciano, R. Experiments in the measurement of spatial association using a parallel supercomputer. *Geographical Systems* **1** (4): 267-288.

- 1993:** Lolonis, P. and Armstrong, M.P. Location-allocation models as decision aids in delineating administrative regions. *Computers, Environment and Urban Systems* **17** (2): 153-174. [https://doi.org/10.1016/0198-9715\(93\)90043-5](https://doi.org/10.1016/0198-9715(93)90043-5)

Armstrong, M.P., Lolonis, P. and Honey, R. A spatial decision support system for school redistricting. *Journal of the Urban and Regional Information Systems Association* **5** (1): 40-52. <http://www.urisa.org/clientuploads/directory/Documents/Journal/vol5no1.pdf>

Armstrong, M.P. Perspectives on the development of group decision support systems for locational problem-solving. *Geographical Systems* **1** (1): 69-81.

- 1992:** Armstrong, M.P., Densham, P.J., Lolonis, P. and Rushton, G. Cartographic displays to support locational decision-making. *Cartography and Geographic Information Systems* **19** (3): 154-164. <https://doi.org/10.1559/152304092783762263>
- Armstrong, M.P. and Densham, P.J. Domain decomposition for parallel processing of spatial problems. *Computers, Environment and Urban Systems* **16** (6): 497-513. [https://doi.org/10.1016/0198-9715\(92\)90041-O](https://doi.org/10.1016/0198-9715(92)90041-O)
- 1991:** Armstrong, M.P., Rushton, G., Honey, R., Dalziel, B.T., Lolonis, P., De, S. and Densham, P.J. Decision support for regionalization: A spatial decision support system for regionalizing service delivery systems. *Computers, Environment and Urban Systems* **15** (1): 37-53. [https://doi.org/10.1016/0198-9715\(91\)90044-E](https://doi.org/10.1016/0198-9715(91)90044-E)
- Honey, R., Rushton, G., Armstrong, M.P., Lolonis, P., Dalziel, B.T., De, S. and Densham, P.J. Stages in the adoption of a spatial decision support system for reorganizing service delivery regions. *Environment and Planning C: Government and Policy* **9** (1): 51-63. [journals.sagepub.com/doi/pdf/10.1068/c090051](https://doi.org/10.1068/c090051)
- Armstrong, M.P. and Hopkins, L. D. Data organization for surface water resources information. *Journal of the Urban and Regional Information Systems Association* **3** (2): 12-24. <http://www.urisa.org/clientuploads/directory/Documents/Journal/vol3no2.pdf>
- 1990:** Hanson, J.S., Malanson, G.P. and Armstrong, M.P. Landscape fragmentation and dispersal in a model of riparian forest dynamics. *Ecological Modelling* **49**: 277-296. [https://doi.org/10.1016/0304-3800\(90\)90031-B](https://doi.org/10.1016/0304-3800(90)90031-B)
- Armstrong, M.P. and Densham, P.J. Database organization strategies for spatial decision support systems. *International Journal of Geographical Information Systems* **4** (1): 3-20. <https://doi.org/10.1080/02693799008941525>
- Armstrong, M.P., De, S., Densham, P.J., Lolonis, P., Rushton, G. and Tewari, V. A knowledge based approach for supporting locational decision-making. *Environment and Planning B: Planning and Design* **17**: 341-364. <https://doi.org/10.1068%2Fb170341>
- Armstrong, M.P. and Bennett, D.A. A bit-mapped classifier for groundwater quality assessment. *Computers and Geosciences* **16** (6): 811-832. [https://doi.org/10.1016/0098-3004\(90\)90005-E](https://doi.org/10.1016/0098-3004(90)90005-E)
- Armstrong, M.P. Database integration for knowledge based groundwater quality assessment. *Computers, Environment and Urban Systems* **14** (3): 187-201. [https://doi.org/10.1016/0198-9715\(90\)90008-H](https://doi.org/10.1016/0198-9715(90)90008-H)

Chapters

- 2017:** Sugumaran, R. and Armstrong, M.P. Cloud computing. In D. Richardson (Editor in Chief), *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. New York, NY: John Wiley, pp. 737-740. <https://doi.org/10.1002/9781118786352.wbieg1017>

- Armstrong, M.P., Tsou, M.-H., and Seidl, D. GeoPrivacy. In *Reference Module in Earth Systems and Environmental Sciences*. Elsevier, 2017, ISBN 9780124095489, <http://dx.doi.org/10.1016/B978-0-12-409548-9.09629-9> .
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- 2015:** Sugumaran, R., Hegeman, J.W., Sardeshmukh, V.B., and Armstrong, M.P. Processing remote sensing data using cloud computing environments. In P. S. Thenkabail (ed.) *Remotely Sensed Data Characterization, Classification, and Accuracies*, New York, NY: Taylor and Francis, pp. 553-564.
- Rushton, G., Armstrong, M.P., Gittler, J., Greene, B., Pavlik, C.E., West, M. and Zimmerman, D. Geocoding in cancer research: A review. In P. Leith (ed.) *Privacy in the Information Society, Volume II*. Burlington, VT: Ashgate. (Reprinted from *American Journal of Preventive Medicine* **30** (2, Supplement 1): S16-S24, 2006.)
- 2014:** Sugumaran R., Burnett, J., and Armstrong M.P. Using a cloud computing environment to process large 3D spatial datasets. In H. Karimi (ed.) *Big Data: Techniques and Technologies in Geoinformatics*. Boca Raton, FL: CRC Press, pp. 53-65.
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- 2013:** Armstrong, M.P. and Hopkins, L.D. Fractals in context: fractal enhancement for thematic display of topologically stored data. B. Wellar, (ed.) *Auto Carto Six Retrospective*, Ottawa, ON: Information Research Board Inc, pp. 125-129. ISBN: 978-0-9921435-0-3
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- 2011:** Armstrong, M.P., Nyerges, T.L., Wang, S. and Wright, D. Connecting geospatial information to society through cyberinfrastructure. T. Nyerges, H. Couclelis and R. McMaster (eds.) *Handbook of GIS and Society Research*. Newbury Park, CA: Sage Publications, pp. 109-122.
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- 2008:** Armstrong, M.P. and Tiwari, C. Geocoding methods, materials, and first steps toward a geocoding error budget. Rushton, G., Armstrong, M.P., Gittler, J., Greene, B.R., Pavlik, C.E., West, M.M., and Zimmerman, D.L. (eds.) *Geocoding Health Data*. Boca Raton, FL: CRC Press, pp. 11-35.
- Zimmerman, D.L., Armstrong, M.P. and Rushton, G. Alternative techniques for masking geographic detail to protect privacy. Rushton, G., Armstrong, M.P., Gittler, J., Greene, B.R., Pavlik, C.E., West, M.M., and Zimmerman, D.L. (eds.) *Geocoding Health Data*. Boca Raton, FL: CRC Press, pp. 127-138.
- Armstrong, M.P., Greene, B. and Rushton, G. Using geocodes to estimate distances and geographic accessibility for cancer prevention and control. Rushton, G., Armstrong, M.P., Gittler, J., Greene, B.R., Pavlik, C.E., West, M.M., and Zimmerman, D.L. (eds.) *Geocoding Health Data*. Boca Raton, FL: CRC Press, pp. 181-194.

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- 2007:** Bennett, D.A., Armstrong, M.P., Mount, J.D. *MoGeo*: A location-based educational service. In *Lecture Notes in Geoinformation and Cartography: Location Based Services and Telecartography*, G. Gartner, W. Cartwright, and M.P. Peterson (eds.), Springer: New York, pp. 493-508. https://doi.org/10.1007/978-3-540-36728-4_35
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- 2006:** He, W., Wang, S., Yan, J., Cowles, M. K., Armstrong, M. P. 2006. “Using PLAPACK and MPICH-G2 to Grid-Enable Bayesian Geostatistical Models”, The First Annual US NSF (National Science Foundation) TeraGrid Conference, Indianapolis, IN, June.
- Wang, S., Briggs, R., Armstrong, M. P., Ni, J. 2006. “A Fast Two-Dimensional Inverse Distance Weighted Interpolation Algorithm Based on a Dynamic Assessment of Nearest-Neighbor Information”, The Association of American Geographers Annual Meeting, Chicago, IL, March.
- 2005:** Armstrong, M.P. “A Primer on Disclosure Limitation Methods”, National Academy of Sciences Workshop on Confidentiality and Geospatial Information, Washington, DC, December.
- 2004:** Xiao, N. Calder, C. and Armstrong, M.P. “A Monte Carlo Approach to Choropleth Mapping under Uncertainty”, GIScience 2004, College Park, MD, October.
- 2003:** Xiao, N. and Armstrong, M.P. “Geographical Problem Solving Using Evolutionary Algorithms: Theory and Application”, Association of American Geographers Annual Meeting, New Orleans, LA. March.
- Armstrong, M.P. “First we Shape our Tools and Then our Tools Shape us: Computational Imperatives in GIScience and their Consequences”, University Consortium for Geographic Information Science, Summer Conference Plenary Session, Asilomar, CA: June.
- 2002:** Wang, S. and Armstrong, M.P. “Exploring Ecosystem Dynamics Using Grid-Enabled Teleimmersive Collaborative Spatial Decision Support Systems (TIDSS)”, Association of American Geographers Annual Meeting, Los Angeles, CA. March.
- Zeng, Y., Bennett, D.A. and Armstrong, M.P. “Using Genetic Algorithms to Develop Co-Evolutionary Multi-agent Decision Support Tools”, Association of American Geographers Annual Meeting, Los Angeles, CA. March.
- Xiao, N., Armstrong, M.P. and Bennett, D.A. “Toward Evolutionary Geographical Problem Solving”, Association of American Geographers Annual Meeting, Los Angeles, CA. March.
- Bennett, D.A., Aspinall, R.A., Armstrong, M.P., Xiao, N. “Rural Landscapes as Complex Adaptive Systems”, The First Lake Arrowhead Conference on Computational Social Science and Social Complexity, Lake Arrowhead, California, USA, May.
- Wang, S., Armstrong, M.P. and Bennett, D.A. “Conceptual Basics of Middleware Design to Support Grid Computing of Geographic Information”, GIScience 2002, Boulder, CO, September.
- Xiao, N., Armstrong, M.P. and Bennett, D.A. “On the Use of Evolutionary Computation and Visualization in Multi-Objective Spatial Decision Making”, GIScience 2002, Boulder, CO, September.
- 2001:** Armstrong, M.P. “Visualization / Collaborative Work / Human-Computer Interfaces”, Plenary presentation at National Academy of Sciences (Computer Science and Telecommunications Board) Workshop on the Intersection of Geospatial Information and Information Technology, Arlington, VA, October.

- Wang, S. and Armstrong, M. “Development and Evaluation of a Teleimmersion Framework for Collaborative Spatial Decision Making”, Annual Meeting of the Association of American Geographers, New York, NY, February.
- Xiao, N. and Armstrong, M.P. “Emergence, Computation, and Geographical Simulation”, Annual Meeting of the Association of American Geographers, New York, NY, February.
- 2000:** Wang, S. and Armstrong, M.P. “Modeling Metapopulation Dynamics with Evolutionary Computational Methods Using Petri Nets”, Annual Meeting of the Association of American Geographers, Pittsburgh, PA, April.
- Xiao, N., Bennett, D.A., Armstrong, M.P. “Solving Spatio-temporal Optimization Problems with Genetic Algorithms: A Case Study of a Bald Cypress Seed Dispersal and Seedling Growth Model”, 4th International Conference on Integrating GIS and Environmental Modeling (GIS/EM4): Problems, Prospects and Research Needs. Banff, Alberta, Canada, September.
- Armstrong, M.P., Bennett, D.A., Densham, P.J. and Sengupta, R. “Theoretical Perspectives on Agent-Oriented Geographic Information Management and Analysis”, GIScience 2000: First International Conference on Geographic Information Science, Savannah, Georgia, USA October.
- Sengupta, R. Bennett, D.A. and Armstrong, M.P. “Agent-Oriented Modeling Environment for Spatial Decision Support”, GIScience 2000: First International Conference on Geographic Information Science, Savannah, Georgia, USA October.
- Bennett, D.A., Armstrong, M.P. and Xiao, N. “Development of Two-dimensional Genetic Algorithms to Evolve Optimal Landscapes”, GIScience 2000: First International Conference on Geographic Information Science, Savannah, Georgia, USA October.
- 1999:** Armstrong, M.P. and Ruggles, A.J. “Map Hacking: On the Use of Inverse Address-Matching to Discover Individual Identities from Point-mapped Information Sources”, GIS and Society Conference, Minneapolis, MN, June.
- 1997:** Chakraborty, J. and Armstrong, M.P. “Geographical Constraints on Environmental Equity Assessment”, AAG Annual Meeting, Fort Worth, TX, March.
- Armstrong, M.P. “Some Thoughts about Bringing Geographical Concepts into Genome Research”, National Center for Geographic Information and Analysis, Workshop on Spatial Genomics, Northeast Harbor, ME, October.
- 1996:** Bennett, D.A., Armstrong, M.P. and Wade, G.A. “Agent Mediated Consensus-Building for Environmental Problems: A Genetic Algorithm Approach”, Third International Conference on Integrating Geographic Information Systems and Environmental Modeling, Santa Fe, NM, January.
- 1995:** Chakraborty, J. and Armstrong, M.P. “Linking a Chemical Dispersion Model with GIS to Assess Community Vulnerability to Hazardous Materials”, Association of American Geographers Annual Meeting, Chicago, IL, March.

Ruggles, A.J. and Armstrong, M.P. "A Typology of Visualization Techniques for Transportation Data", Association of American Geographers Annual Meeting, Chicago, IL, March.

Armstrong, M.P. "Parallel Spatial Data Analysis: Opportunities and Challenges", National Center for Supercomputing Applications Workshop, University of Illinois, Urbana, IL, April.

Rushton, G. and Armstrong, M.P. "Spatial Data Sharing: A View from Iowa", Annual Conference of the Urban and Regional Information Systems Association, San Antonio, TX, July.

- 1994:** Armstrong, M.P. and Densham, P.J. "A Conceptual Framework for Improving Human Computer Interaction in Locational Decision-Making", NATO Advanced Research Workshop on Human-Computer Interaction for GIS, Palma, Mallorca, Spain, March.

Densham, P.J. and Armstrong, M.P. "Human-Computer Considerations in Visual Interactive Locational Analysis", NATO Advanced Research Workshop on Human-Computer Interaction for GIS, Palma, Mallorca, Spain, March.

Armstrong, M.P. "A Heterogeneous Approach to High Performance Geographical Computing", Association of American Geographers Annual Meeting, San Francisco, CA, April.

Armstrong, M.P. "New and Developing Technologies in GIS", 32nd Annual Conference of the Urban and Regional Information Systems Association, Milwaukee, WI, August.

Armstrong, M.P. "Neural Networks and Parallel Computing for Spatial Data Handling: Problems and Prospects". GIS/LIS '94, Phoenix, AZ, October.

- 1993:** Armstrong, M.P. "HyperKarte: a Hypermedia-Based Approach to Instruction in Thematic Cartography", Association of American Geographers Annual Meeting, Atlanta, GA, April.

Pavlik, C.E. and Armstrong, M.P. "Parallel Processing of Spatial Series", Computing in the Social Sciences Conference, National Center for Supercomputing Applications, Urbana, IL, May.

- 1992:** Armstrong, M.P. "Decision Support for Group Decision-Making", Association of American Geographers Annual Meeting, San Diego, CA, April.

Rokos, D. and Armstrong, M.P. "An Application of Parallel Programming to a Drainage Network Extraction Algorithm", Association of American Geographers Annual Meeting, San Diego, CA, April.

Armstrong, M.P. "Approaching the Millennium: The Evolution of Software and Hardware Technologies and Their Impacts on Geographical Decision-Making", invited presentation at the Mid-Continent GIS Symposium, Kansas City, MO, May.

Armstrong, M.P. "The Modifiable Spatial Filter Method for Projecting School Enrollments for Reorganized Facility Service Areas", The Fourth International Conference on Applied Demography, Bowling Green, OH, October.

- 1991:** Armstrong, M.P. “A GIS-Based Spatial Filter for Measuring Small-Area Changes in School-Age Populations”, Association of American Geographers Annual Meeting, Miami, FL, April.
- Rushton, G., Armstrong, M.P. and Lolonis, P. “Projecting Spatial Demand Data in Location-Allocation Analyses for School Location Decisions”, Operations Research Society of America Annual Meeting, Anaheim, CA, November.
- 1990:** Armstrong, M.P. “Knowledge Classification and Organization for Cartographic Generalization”, Symposium on Rule Based Cartographic Generalization, National Center for Geographic Information and Analysis and Syracuse University, Syracuse, NY, April.
- Armstrong, M.P. “Cartographic Line Generalization: Rule Base Specification and Evaluation”, Association of American Geographers Annual Meeting, Toronto, Ontario, April.
- Lolonis, P. and Armstrong, M.P. “Controlling Service Area Boundaries in Locational Decision-Making”, Association of American Geographers Annual Meeting, Toronto, Ontario, April.
- De, S., Armstrong, M.P., Lolonis, P. and Rushton, G. “A Knowledge-Based System for Geographic Restructuring of a Service System”, Operations Research Society of America Meeting, Philadelphia, PA, October.

Invited Lectures and Colloquia (since 1994)

- 2010:** Department of Geography, University of Northern Iowa
Department of Geography and National Center for Geographic Information and Analysis,
State University of New York at Buffalo, Amherst, NY
- 2009:** Department of Geography, University of Utah
- 2007:** Department of Urban and Regional Planning, University of Illinois, Urbana, IL
Department of Geography, San Diego State University, San Diego, CA
- 2005:** Oak Ridge National Laboratory, Oak Ridge, TN
Department of Geography, University of Tennessee, Knoxville, TN
- 2003:** Department of Geography, The Ohio State University, Columbus, OH
Department of Geography, University of Illinois, Urbana, IL
- 1998:** Department of Geography, Pennsylvania State University, State College, PA
- 1997:** Department of Geography and National Center for Geographic Information and Analysis,
State University of New York at Buffalo, Amherst, NY
- 1995:** Department of Geography and Interdisciplinary GIS Seminar, University of Illinois, Urbana,
IL
- 1994:** Department of Geography, University College London, London, UK
Department of Geography, University of Minnesota, Minneapolis, MN

HONORS AND AWARDS

1970: New York State Regents Scholarship (based on statewide examination)

2002: University of Iowa Innovations in Instructional Computing Award

2005: University of Iowa Presidential Award for Technology Innovation in Teaching

2005: University of Iowa College of Liberal Arts and Sciences, Collegiate Fellow

2005: University of Iowa, CIC Academic Leadership Program, Fellow

2006: University of Iowa Innovations in Instructional Computing Award

2007: Getis Distinguished Lecturer, San Diego State University

2008: Waldo Tobler Distinguished Lecture, Association of American Geographers, Boston, MA

2013: University of Iowa Innovations in Teaching with Technology Award

EXTERNAL GRANTS

External, Principal or Co-Principal Investigator

Year	Amount	Agency	Research
1990, PI	\$99,810	NSF- Geography and Info Technologies	Improving human-computer interaction in locational decision making
1991, PI	\$36,000	NSF- UG Curr Development in Eng, Sci & Math	A hypermedia knowledge-based approach to introductory cartography
1991, CoPI G. Malanson	\$55,194	Midwest Center, Natl Institute for Global Env Change	Simulation experiments of inertia in forest response to climatic warming
1991, CoPI R. Rajagopal	\$100,000	US EPA	Knowledge-based systems for ground water quality assessments
1992, CoPI G. Rushton	\$110,646	US DOT Midwest Transport Center	Development of a spatial data infrastructure for transportation planning and public policy analysis
1993, PI	\$133,940	US Dept of Education	Geographic Information Systems Literacy Institute
1993, CoPI G. Rushton	\$108,311	US DOT Midwest Transport Center	Development of a spatial data infrastructure for transportation planning and public policy analysis: Year 2
1994, CoPI G. Rushton	\$248,031	US Dept of Education	Improving public health using geographic information and analysis
1994, CoPI G. Malanson	\$25,000	Midwest Center, Natl Institute for Global Env Change	Scaling in a spatially explicit model of of ecological response to global change
1995, CoPI G. Malanson	\$43,000	Midwest Center, Natl Institute for Global Env Change	Maintaining fine scale information while coarsening scale in an ecological simulation
1996, CoPI G. Malanson	\$45,700	Midwest Center, Natl Institute for Global Env Change	Maintaining fine scale information while coarsening scale in an ecological simulation: Year 2
1997, PI	\$280,000	NSF-ILI and Geography	ENVISAGE: Environmental visualization and geographic exploration
1997, PI	\$289,000	NASA	Project LIVE: Laboratory for the Immersive Visualization of the Environment
2004, CoPI A. Karr (NISS) & G. Duncan (CMU)	\$98,000	NSF- Social and Economic Sciences	Statistical disclosure limitation for geospatial image data

EXTERNAL GRANTS

Associate Investigator

Year	Amount	Agency	Research
1991, J.B. Tomlin, PI	\$1,300,000	NIH	Epidemiology of specific language disorder
2002, G. Rushton, PI	\$1,500,000	NCI	A GIS based workbench to interpret cancer maps
2002, D. McGinnis Idaho State, PI	\$1,971,993	NSF Biocomplexity in the Environment	Complexity across boundaries- coupled natural and human systems
2003, B. Greene, PI	\$750,000	CDC and ASPH	Prostate cancer geocoding: ensuring fitness for use

SEED AND INTERNAL GRANTS

Year	Amount	Program	Research
2000	\$16,234	CLAS	Capstone GIS laboratory
2001	\$30,000	CLAS	Upgrading GIS Instructional Laboratory
2002	\$15,000	CLAS	Upgrading GIS Instructional Laboratory
2002	\$25,000	UI Informatics Initiative	Collaborative research on grid computing, with M.K. Cowles (Statistics) and S. Wang (ITS)
2002	\$8,000	Innovations in Instructional Computing	Integrating wireless GIS into the undergraduate curriculum, with D. Bennett
2006	\$26,000	Innovations in Instructional Computing	Statistical analysis of spatiotemporal data using cyberinfrastructure
2013	\$5,230	Innovations in Teaching with Technology	Acquiring a remote sensing drone, with M. Linderman

TEACHING

Semester/Year	UG Advisees	Grad Advisees	Course Number and Title	Enrolled
Spring 2010	10	1	44:197 Ethical Collection and Use of Geospatial Information	11

Ph.D. Students Supervised

Name	Role	Outcome	Current Position
Bennett, David	Chair	PhD, 1993	Professor, The University of Iowa
Lolonis, Panagiotis	Chair	PhD, 1994	Director Planning, Hellenic Cadastre, Greece
Rokos, Demetrius	Chair	PhD, 1995	Asst to President, Hellenic Cadastre, Greece
Chakraborty, Jay	Chair	PhD, 1999	Professor, University of Texas, El Paso
Xiao, Ningchuan	Chair	PhD, 2003	Professor, The Ohio State University
Wang, Shaowen	Chair	PhD, 2004	Professor, University of Illinois
Haynes, David	Chair	PhD, 2013	Postdoc, University of Minnesota

I have served as:

A member of numerous University of Iowa Ph.D. committees in Geography (>25), Statistics (2), and Electrical Engineering (1)

An external member of Ph.D. committees at the University of Toronto, State University of New York at Buffalo (2), and Southern Illinois University

A member of numerous UI M.A. committees

Courses Taught

The University of Iowa: Department of Geography
 Ethical Collection and Use of Geospatial Information
 Foundations of Geographic Information Science
 Introduction to Cartography
 Computer Methods in Geographical Analysis
 Principles of Geographic Information Systems
 Urban Geographic Information Systems
 Analytical Cartography
 Geographic Information Science Seminar
 Remote Sensing and GIS

The University of Iowa: Department of Computer Science
 Computer Graphics

University of Illinois: Department of Landscape Architecture
 Natural Resource Information Systems

SERVICE

Department of Geography

2000-2012	Departmental Executive Officer (Chair)
1998-2000	Departmental Representative to CLAS Faculty Assembly
1995-1999	Director, Graduate Studies and Recruitment
1996-1999	Director, GIS Instructional Laboratory
1984-2000	Numerous search, colloquium & curriculum committees

College of Liberal Arts and Sciences

2011-2012	Dean's Administrative Fellow
2009	Promotion and Tenure Advisory Committee
2008-2010	Administrative Fellow
2005	Educational Policy Committee (Spring 05)
2005-2007	Administrative Fellow
2004-2005	<i>ad hoc</i> Humanities and Social Sciences Building Committee
2004	<i>ad hoc</i> Budget Committee
2004	<i>ad hoc</i> Graduate Program Review Committee
2001-2006	Promotion and Tenure Advisory Committee
2001-2004	Information Technology Advisory Committee (Chair 03-04)
1991-1993	Quantitative and Formal Reasoning GRE Committee
1994-1995	Review Committee, Iowa Social Science Institute
1999	Commencement Speaker Selection Committee

University of Iowa

2011-2012	Search Committee, Vice President for Research and Development
2003-2010	Informatics Steering Committee (Graduate College)
2006-2009	Research Computing Strategic Planning Executive Committee
2008-2009	Graduate Council (appointed to fill vacancy)
2007	University of Iowa Computer Security Task Force
2006-2008	Information Management for Finance and Operations Advisory Group (VP for Finance and Operations)
2006	Promotion and Tenure Collegiate Consulting Committee (Graduate College)
2003-2006	Information Technology Advisory Committee (Charter Committee), Chair 2005-06
2005-2006	Information Technology Review Committee (Office of the Provost)
2003-2006	Graduate Council (Graduate College, CLAS elected representative)
2003-2004	Search Committee, Associate Vice President for Research and Director of Sponsored Programs
1989-2000	Advanced Research Computing Advisory Committee (VPR), Chair 1996-97
1991-1992	Graduate College Review Committee, Department of Civil and Environmental Engineering
1991-1992	UI Libraries Strategic Planning Task Force on Maps and Spatial Data Collections

Profession

Memberships

Association of American Geographers
 Association for Computing Machinery
 Canadian Cartographic Association
 Cartography and Geographic Information Society
 IEEE Computer Society

Elected Board Member

University Consortium for Geographic Information Science (2007-2009)

Journal Editor

1998-2000 North American Editor, *International Journal of Geographical Information Science*

1994-1996 Associate Editor, *Cartography and Geographic Information Systems*

Editorial Boards

2002-2010 *Geographical Analysis*
 2000-2009 *International Journal of Geographical Information Science*
 2000-2007 *Cartography and Geographic Information Science*
 1996-2007 *Geoinformatica*
 1996-2002 *Geographical and Environmental Modelling*
 1992-2000 *Journal of the Urban and Regional Information Systems Association*

Reviewer

Cartography and Geographic Information Science, International Journal of Geographical Information Science, Computers & Geosciences, Computers, Environment and Urban Systems, Journal of the Urban and Regional Information Systems Association, Cartographica, Photogrammetric Engineering and Remote Sensing, The Professional Geographer, Environment and Planning B: Planning and Design, Geographical Systems, Journal of Computing in Civil Engineering, Transportation Sciences, Managerial and Decision Economics, Journal of the American Society for Information Science, Journal of Housing Research, Geographical and Environmental Modelling, Environment and Planning A, Transactions in GIS, Geographical Analysis, Geoinformatica, Annals of the Association of American Geographers

National Science Foundation, numerous *ad hoc* proposal reviews

Service through Conference Direction and Organization

1992- 1993 Co-Director, Eleventh International Symposium on Computer-Assisted Cartography (Auto-Carto 11)

1992-1994 Steering Committee for GIS/LIS Conferences (Conference Chair, 1994)

National Science Foundation, Proposal Review Panels and other Roles

Geography and Regional Science Program, Panel Member

Instrumentation and Laboratory Improvement Program, Panel Member
Graduate Research Traineeship Program, Panel Member
Science and Engineering Information Integration and Informatics Program, Panel Member
Social and Economic Sciences Division, Committee of Visitors Member (Review of Methodology,
Measurement, and Statistics Program)

<https://www.nsf.gov/od/iaa/activities/cov/sbe/2010/2010%20COV%20Members.pdf>

National Academy of Sciences, National Research Council Study Panels

- | | |
|-----------|---|
| 2003 | Reviewer for <i>IT Roadmap to a Geospatial Future</i> . Washington, DC: National Academy Press. |
| 2004-2005 | Committee on Basic and Applied Research Priorities in Geospatial Science at the National Geospatial-Intelligence Agency |
| 2005-2006 | Committee on Confidentiality Issues Arising from the Integration of Remotely Sensed Data with Social Science Survey and Other Self-Identifying Data |
| 2006 | Committee on Beyond Mapping, Review Coordinator for <i>Beyond Mapping: Meeting National Needs through Enhanced Geographic Information Science</i> . Washington, DC: National Academy Press. |
| 2012 | Report Reviewer, Panel on Estimating Children Eligible for School Nutrition Programs Using the American Community Survey |