

SOMAYEH DODGE, PhD

Assistant Professor of GIScience

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EDUCATION

Institutions	Location	Major or Area	Degree/Year
K.N.Toosi U of Technology	Tehran, Iran	Surveying/Geomatics Engineering	BSc. 2003
K.N.Toosi U of Technology	Tehran, Iran	Geographic Information Systems Engineering	MSc. 2005
University of Zurich	Zurich, Switzerland	Geography/Geographic Information Science	PhD. 11/2011
University of Zurich	Zurich, Switzerland	Computational Movement Research	2011-2012
The Ohio State University	Columbus, OH	Computational Movement Ecology	2012-2013

PROFESSIONAL EXPERIENCES

Year	Appointment
2016 – .	Assistant Professor, University of Minnesota, Twin Cities
2014 – 2016	Assistant Professor, University of Colorado Colorado Springs (UCCS)
2014 – 2016	Director, Geospatial Research Lab, UCCS
2013 – 2014	Visiting Assistant Professor, University of Colorado Colorado Springs

REFEREED PUBLICATIONS

* indicates student co-authors

Peer Reviewed Book Chapters

- [2] **Dodge, S.** (2016). From Observation to Prediction: The Trajectory of Movement Research in GI-Science. In Onsrud, H. and Kuhn, W., (Eds.), *Advancing Geographic Information Science: The Past and Next Twenty Years*. Chapter 9. pp. 123 – 136. GSDI Association Press.
- [1] Obringer, R., Bohrer, G., Weinzierl, R., **Dodge, S.**, Deppe, J., Ward, M., Brandes, D., Kays, R., Flack, A., and Wikelski, M., (forthcoming) Track Annotation: Determining the Environmental Context of Movement Through the Air. In Chilson, P.B., Frick, W.F., Kelly, J.F., Liechti, F., (Eds.), *Aeroecology*. Chapter 4., pp. 71 – 76, Springer. doi:10.1007/978-3-319-68576-2_4.

Peer Reviewed Journal Articles

- [12] Ahearn, SC., **Dodge, S.**,(2018), Recursive Multi-frequency Segmentation of Movement Trajectories (ReMuS), *Methods in Ecology and Evolution*. <http://onlinelibrary.wiley.com/doi/10.1111/2041-210X.12958/full> 2018: 1 – 13 (Accepted on 30 November 2017.)
- [11] Soleymani*, Pennekamp, F., **Dodge, S.**, and Weibel, R., (2017). Characterizing change points and continuous transitions in movement behaviors using wavelet decomposition. *Methods in Ecology and Evolution*. Vol. 8, Issue 9, September 2017, pp 1113 – 1123. doi:10.1111/2041-210X.12755.
- [10] Ahearn, SC., **Dodge, S.**, Simcharoen*, A., Xavier*, G., Smith J.L.D., (2017) A context-sensitive simulation model for movement: a spatiotemporal Monte Carlo approach. *International Journal of Geographic Information Science*. **31**(5). pp. 867–883. doi:10.1080/13658816.2016.1224887. (Published Online: 30 Aug 2016)

- [9] **Dodge, S.**, Weibel, R., Ahearn, SC., Buchin, M., Miller, J., (2016) Analysis of Movement Data. *International Journal of Geographic Information Science*. **30**(5). pp. 825–834. doi:10.1080/13658816.2015.1132424.
- [8] Buchin, M., **Dodge, S.**, and Speckmann, B. (2014). Similarity of Trajectories Taking into Account Geographic Context. *Journal of Spatial Information Science (JOSIS)*. No. 9, pp. 101–124, doi: 10.5311/JOSIS.2014.9.179.
- [7] Soleymani*, A., Cachat, J., Robinson, K., **Dodge, S.**, Kalueff, A., and Weibel, R., (2014). Integrating cross-scale analysis in the spatial and temporal domains for classification of behavioral movement. *Journal of Spatial Information Science (JOSIS)*. No. 8, pp. 1–25, doi:10.5311/JOSIS.2014.8.162.
- [6] **Dodge, S.**, Bohrer, G., Bildstein, K., Davidson, S.C., Weinzierl, R., Bechard, M.J., Barber, D., Kays, R., Brandes, D., Han, J., and Wikelski, M., (2014). Environmental effects on multi-year variability in movement ecology of turkey vultures (*Cathartes aura*) in North and South America. *Journal of Philosophical Transactions B*. Special issue: “Satellite Remote Sensing for Biodiversity Research and Conservation Applications”. May 2014, 369: 20130195. doi:10.1098/rstb.2013.0195.
- [5] **Dodge, S.**, Bohrer, G., Weinzierl, R., Davidson, S.C., Kays, R., Douglas, D., Cruz, S., Han, J., Brandes, D., and Wikelski, M., (2013). The Environmental-Data Automated Track Annotation (*Env-DATA*) System: Linking Animal Tracks with Environmental Data. *Journal of Movement Ecology*, July 2013, 1:3, BioMed Central Ltd. doi:10.1186/2051-3933-1-3.
- [4] **Dodge, S.**, Laube, P., and Weibel, R. (2012). Movement Similarity Assessment Using Symbolic Representation of Trajectories. *International Journal of Geographic Information Science*. Volume 26, Issue 9, pages 1563–1588, Taylor & Francis.
- [3] **Dodge, S.**, Weibel, R. and Forootan, E. (2009). Revealing the Physics of Movement: Comparing the Similarity of Movement Characteristics of Different Types of Moving Objects. *Journal of Computers, Environment and Urban Systems*, Volume 33, Issue 6, November 2009, pages 419–434.
- [2] **Dodge, S.**, Weibel, R. and Lautenschütz, A.K. (2008). Towards a Taxonomy of Movement Patterns. *Journal of Information Visualization*, Vol. 7, pages 240–252.
- [1] Alesheikh, A. and **Dodge, S.**, (2006). Develop and Implementing A Spatio-Temporal Database Management System, *Journal of the College of Engineering, University of Tehran*, Vol. 40, No. 8, pages 1039–1049, ISBN:0803-1026.

Peer Reviewed Conference Proceedings

- [6] **Dodge, S.**, (2016). Context-sensitive spatiotemporal simulation model for movement. Short paper. *GIScience conference 2016*.
- [5] Bohrer, G., Kays, R., Davidson, S., Weinzierl, R., **Dodge, S.**, McClain, K.M., Wikelski, M., (2015). Remote Sensing in Support of Endangered Species Management and Animal Movement Research – The Env-DATA tool pack. *66th International Astronautical Congress*. pp. 2-7, 12-16 October, Jerusalem, Israel, IAC-15-B5,2,8,x30258.
- [4] Xavier*, G. and **Dodge, S.**, (2014). An Exploratory Visualization Tool for Mapping the Relationships between Animal Movement and the Environment. In Proceedings of the *2nd ACM SIGSPATIAL International Workshop on Interacting with Maps*. pp. 36–42, doi:10.1145/2677068.2677071
- [3] Buchin, M., **Dodge, S.**, and Speckmann, B. (2012). Context-Aware Similarity of Trajectories. In Xiao, N., Kwan, M.P., Goodchild, M.F. & Shekhar, S. (Eds.): *Geographic Information Science, Lecture Notes in computer Science (LNCS)*: 7478, pages 43–56, Springer-Verlag Berlin Heidelberg, *GIScience 2012*. 18-21 September 2012, Columbus, Ohio. USA.

- [2] **Dodge, S.**, Weibel, R., and Laube, P. (2011). Trajectory Similarity Analysis in Movement Parameter Space. *GISRUK 2011*, pages 270–279. Short paper. April 27–29, 2011, University of Portsmouth, UK.
- [1] **Dodge, S.**, Weibel, R. and Laube, P. (2009). Exploring Movement – Similarity Analysis of Moving Objects. *The SIGSPATIAL Special*, Volume 1, Issue 3, pages 11–16. The *17th ACM International Conference on Advances in Geographic Information Systems*. 4–6 November 2009. PhD Showcase.

Edited Proceedings

- [1] Birkin, M., **Dodge, S.**, Fasy., B., T., Mann, R.P., (2018). “From Observations to Prediction of Movement (Dagstuhl Seminar 17282).” In *Dagstuhl Reports*, vol. 7, no. 7, pages 54 – 71, Schloss Dagstuhl – Leibniz Center for Informatics, doi:10.4230/DagRep.7.7.54.

Monograph

- [1] **Dodge, S.**, (2011). Exploring Movement Using Similarity Analysis, PhD Dissertation, Department of Geography, University of Zürich, Switzerland. 160 pages.

NON-REFEREED PUBLICATIONS

Extended Abstracts

- [5] Ahearn, S.D., **Dodge, S.**, Simcharoen, A., Smith, JLD, (2017), Patrolling Behavior of Tigers (*Panthera tigris*) and Geographic Context. NSF workshop on analyzing movement and mobility within geographic context, May 11–12, 2017 Columbus, Ohio
- [4] **Dodge, S.** and Xavier*, G. (2015). Hybrid Visualization of Movement in a Spatiotemporal Context. *GeoVIS 2015: Rendering and Cognition with Images and Hybrid Visualizations*. ISPRS Geospatial Week. La Grande Motte, France. 28th September - 2nd October 2015.
- [3] **Dodge, S.**, Bohrer, G., and Weinzierl, R. (2012). Movebank Track Annotation Project: Linking Animal Movement Data with the Environment to Discover the Impact of Environmental Change in Animal migration, In *Workshop on GIScience in the Big Data Age 2012*, pages 35–41, Short paper. 18 September 2012, Columbus, Ohio, USA.
- [2] **Dodge, S.** and Buchin, M., (2012) Assessment of the Effect of the Climatic Conditions on the Movement Behaviors of the North Atlantic. *MOVE STSM report*. <http://move-cost.info>.
- [1] **Dodge, S.**, Weibel, R. and Lautenschütz, A.K. (2008). Taking a Systematic Look at Movement: Developing a Taxonomy of Movement Patterns. *GeoVisualization of Dynamics, Movement and Change Workshop at the AGILE 2008 Conference*, 5 May 2008, Girona, Spain. Extended Abstract.

Short Abstracts

- [15] **Dodge, S.** (2018). Visual Analytics of Tiger Movement Interactions, Predator-Prey Interactions: Mechanisms and Outcomes of Predator-Prey Interactions: Scaling Across Space and Time, Gordon Research Conference 2018, Ventura, CA.
- [14] Ahearn, SC., **Dodge, S.**, Simcharoen*, A., Smith J.L.D., (2016) Exploring Patterns of Interaction in Movement of tigers (*Panthera tigris*). Workshop on measuring and analyzing interactions among mobile entities UT-Austin, November 10–11, 2016
- [13] **Dodge, S.** and Xavier*, G. (2016) DYNAMO: Dynamic Visualization of Animal Movement and the Environment. *Dagstuhl Seminar 16022: "Geometric and Graph-based Approaches to Collective Motion"*, 10 – 15 January 2016, Dagstuhl Schloss. Germany.

- [12] **Dodge, S.**, Buchin, M., and Ahearn, SC. (2015). Including Spatiotemporal Context in the Visualization and Analysis of Dynamic Processes. *The AAG 2015 Annual Meeting*. 21–25 April 2015. Chicago, IL.
- [11] Xavier*, G. and **Dodge, S.**, (2015). Visualization of Animal Movement and the Environment. *The AAG 2015 Annual Meeting*. 21–25 April 2015. Chicago, IL.
- [10] Xavier*, G. and **Dodge, S.**, (2014). Dynamic visualization of animal movement data and environmental variables. Visualization competition at the Symposium on Animal Movement and the Environment. Demo available at <https://www.youtube.com/watch?v=i-dNHTBUaE>.
- [9] Bohrer, G., **Dodge, S.**, Weinzierl, R., Davidson, S.C., Kays, R., Douglas, DC, Brandes, D., Bildstein, K., and Wikelski, M. (2013). The Environmental-Data Automated Track Annotation (Env-DATA) System: Linking Animal Tracks with Environmental Data. *American Geophysical Union, Fall Meeting 2013*, abstract #IN11C-15399, 9 – 13 December 2013, San Francisco, CA.
- [8] Davidson, S.C., **Dodge, S.**, Weinzierl, R., Kays, R., Wikelski, M., Bohrer, G., (2013). New services for archiving, processing, and analyzing avian movement data on Movebank. *The 131st Stated Meeting of the American Ornithologists' Union* held in conjunction with *the 83rd Annual Meeting of the Cooper Ornithological Society*, 14 – 17 August 2013, Chicago, IL.
- [7] Davidson, S.C., Bohrer, G., **Dodge, S.**, Weinzierl, R., Kays, R., and Wikelski, M., (2013). Incorporating remote sensing and environmental data in animal movement research using the Env-DATA system and Movebank. *The 98th Ecological Society of America Annual Meeting*, 4 – 9 August 2013, Minneapolis, MN.
- [6] **Dodge, S.**, Bohrer, G., Davidson, S.C., Weinzierl, R., Wikelski, M., and Kays, R., (2013). Exploring Animal Movement Patterns in Response to Environmental Change. *The AAG Annual Meeting*, 9 – 13 April 2013, Los Angeles, California.
- [5] Davidson, S.C., Kays, R., Wikelski, M., Weinzierl, R., **Dodge, S.**, and Bohrer, G., (2012). Exploring How Animals Respond to Environmental Change: Linking Animal Movement Data to Global Environmental Datasets with Movebank. *International Conference on Managing Protected Areas under Climate Change (IMPACT'12)*. 24 – 26 September 2012, Dresden, Germany.
- [4] Kenny, W.T., Bohrer, G., **Dodge, S.**, Garrity, S.R., Matheny, A.M., Low, P., and Maurer, KD. (2012). Tree-Scale Forest Structure for Modeling of Hydrodynamic Stresses. Poster presentation. *ForestSAT 2012*, 11 – 14 September 2012, Oregon State University, Corvallis, OR.
- [3] **Dodge, S.**, Weibel, R., and Laube, P. (2012). Segmentation-based Similarity Assessment of Movement Trajectories, *The AAG Annual Meeting*, 24 – 28 February 2012, New York, NY.
- [2] **Dodge, S.**, Weibel, R., (2008). Moving Object Trajectory Mining – Trajectory Decomposition Algorithm. Presentation at *Representation, Analysis and Visualization of Moving Objects*, Dagstuhl Seminar 08451, 2 – 7 November 2008, Dagstuhl, Germany.
- [1] **Dodge, S.**, Weibel, R., Fabrikant, S.I., (2007). Spatio-Temporal Pattern Analysis of Moving Point Objects Utilizing Eye Movement Data. Poster presentation at the *5th Geographic Information Days*, 10 – 12 September 2007 (GIDays 2007), Münster, Germany.

PRESENTATIONS

Invited Talks

- [11] Contextualizing Movement: An Interdisciplinary Approach to Analytics and Modeling of Moving Phenomena, Colloquium at the Computer Science and Engineering at the University of Minnesota, 27 November 2017.
- [10] Modeling movement in context: going beyond trajectory points. Lightning Talk Speakers at the 2017 UMN Spatial Forum, 15 November 2017.

- [9] Computational Movement Analysis, invited Featured Speaker at the *Girls Who Code* at the University of Minnesota, 23 June 2017.
- [8] Contextualizing movement: from measurement to modeling, invited Keynote Speaker at the *NSF Mobility workshop*, the Ohio State University. 11 May 2017. Columbus, OH.
- [7] Modeling Movement Within Geographic Context, invited speaker at the *Minnesota Population Center*, University of Minnesota. 5 May 2017. Minneapolis, MN.
- [6] Analysis and Visualization of Movement, invited Featured Speaker at the *Girls Who Code* at the University of Minnesota, 22 February 2017.
- [5] The continuum of movement research: from observations to modeling dynamic processes. *Symposium on Human Dynamics Research: Space-Time Analytics (Themes and Applications)*, the AAG Annual Meeting 2016, 30 March, San Francisco, CA.
- [4] Annotation and visualization of animal movement with environmental variables. *Tiger Conservation and Vertebrate Field Methods* offered by the University of Minnesota, Khao Nang Rum Wildlife Research Center, 4 January 2016, Thailand.
- [3] From Observation to Prediction: The Trajectory of Movement Research in GIScience. *Advancing Geographic Information Science: The Past and Next Twenty Years*. 2015 Vespucci Institute. 30 June 2015, College of the Atlantic, Bar Harbor, ME.
- [2] Environmental data track annotation with Env-DATA. Symposium on Animal Movement and the Environment. Invited tutorial, 6 May 2014, Raleigh, NC. Video available: <https://www.youtube.com/watch?v=0ixZefp45Lc>.
- [1] Exploring Animal Movement Using Similarity Analysis, Invited talk at the *Max Planck Institute for Ornithology (MPIO)*, Radolfzell, Germany, 13 September 2011.

Guest Lectures

- [9] “Networking and Navigating Conferences”, in GEOG 8405: Professional Development, Spring 2017, University of Minnesota, Minneapolis, MN.
- [8] “Map animation principles and applications”, in GEOG 3511: Principles of Cartography, Spring 2017, University of Minnesota, Minneapolis, MN.
- [7] “Analysis and visualization of animal movement”, in GES 5010: Geographic Research Seminar, Spring 2016, University of Colorado, Colorado Springs, CO.
- [6] “GIS and its applications” in GES 2050: Digital Earth. Fall 2015. University of Colorado, Colorado Springs, CO.
- [5] “Introduction to Geospatial technologies, data portals, and applications”, Windsor GIS professional development workshop. 28 May 2014, Windsor High School, Windsor, CO.
- [4] “Exploring Movement” in GES 2050: Digital Earth. Fall 2013. University of Colorado, Colorado Springs, CO.
- [3] “Remote Sensing and Global Climate Change” in CIVILEN 885: Advanced Civil Engineering, Spring Quarter 2012, The Ohio State University.
- [2] “Research Visits and Summer Schools for Doctoral Students” in PhD seminar I, Dec 2011, University of Zurich.
- [1] “Movement Pattern Analysis” in GEO453: Geographic Information Science Graduate Seminar, June 2007, University of Zurich.

Conference Presentation

- [15] Mapping Movement Interaction of Tigers, (2018), Predator-Prey Interactions: Mechanisms and Outcomes of Predator-Prey Interactions: Scaling Across Space and Time, Gordon Research Conference 2018, Ventura, CA. (poster presentation)
- [14] IJGIS Special issue on Analysis of Movement Data. *The AAG 2017 Annual Meeting*. 8 April 2017. Boston, MA.
- [13] DYNAMO: Dynamic Visualization of Animal Movement and the Environment. *Dagstuhl Seminar 16022: "Geometric and Graph-based Approaches to Collective Motion"*, 14 January 2016, Dagstuhl Schloss. Germany.
- [12] Including Spatiotemporal Context in the Visualization and Analysis of Dynamic Processes. *The AAG 2015 Annual Meeting*. 22 April 2015. Chicago, IL.
- [11] Context-Aware Similarity of Trajectories, *Analysis & Visualization of Movement: MOVE Proudly Presents. COST IC0903 MOVE Final Conference*. Video presentation (https://www.youtube.com/watch?v=S5ceuqgJL_o). Technical University of Vienna, Vienna, Austria, 30 October 2013.
- [10] Exploring Animal Movement Patterns in Response to Environmental Change, Presentation at *the AAG Annual Meeting 2013*, Los Angeles, CA, 11 April 2013.
- [9] Movebank Track Annotation Project: Linking Animal Movement Data with the Environment to Discover the Impact of Environmental Change in Animal migration, Presentation at *Workshop on GIScience in the Big Data Age 2012*, Columbus, OH, 18 September 2012.
- [8] Movebank: Current State and Work Ahead, Presentation at *NASA Biological Response to Climate Change – Movebank Track Annotation Workshop*, Denali Education Center, Denali, Alaska, 5 June 2012.
- [7] Segmentation-based Similarity Assessment of Movement Trajectories, Presentation at *the AAG Annual Meeting 2012*, New York, NY, 28 February 2012.
- [6] Knowledge Discovery from Trajectories Using Movement Parameters, Presentation at the *MOVE - SHOWCASE Working Days on Tracking Recreational Behavior*, University of Zurich, Zurich, Switzerland, 27 October 2011.
- [5] Trajectory Similarity Analysis in Movement Parameter Space, Presentation at *GISRUK 2011*, University of Portsmouth, UK, 29 April 2011.
- [4] Movement Similarity Assessment, Graduate School Retreat Seminar, Einsiedeln, Switzerland, 27 November 2010.
- [3] Exploring Movement – Similarity Analysis of Moving Objects, PhD showcase at *The 17th ACM SIGSPATIAL GIS*, Seattle, WA, 5 November 2009.
- [2] Moving Object Trajectory Mining – Trajectory Decomposition Algorithm, Presentation at *Dagstuhl Seminar 08451: Representation, Analysis and Visualization of Moving Objects*, Dagstuhl, Germany, 2-7 November, 2008. Taking a Systematic Look at Movement: Developing a Taxonomy of Movement Patterns. *AGILE Workshop: GeoVisualization of Dynamics, Movement and Change*, Girona, Spain, 5 May 2008.
- [1] Spatio-Temporal Pattern Analysis of Moving Point Objects Utilizing Eye Movement Data, Poster presentation at *the 5th Geographic Information Days (GIDays 2007)*, Münster, Germany, 10-12 September 2007.

AWARDS

- 2016 Proposal 62-0616 to organize a Dagstuhl Seminar on “From Observations to Prediction of Movement”, awarded by Scientific Directorate of Schloss Dagstuhl, Leibniz-Zentrum für Informatik GmbH, Germany

GRANTS AND SCHOLARSHIPS
Research and Teaching Grants

Year	fund	funding source	project/program
2017	\$40,135	Office of the Vice Provost for Research, University of Minnesota, Grant-in-Aid of Research, Artistry & Scholarship Program	Modeling Movement Interactions Between Tigers and Leopards
2017	\$1500	UMN College of Liberal Arts (CLA)	2017-18 Career Readiness Faculty Fellow

Awards for Undergraduate Research Assistant

Year	fund	University of Minnesota program	project
2017	\$1500	Geri Nelson Cross-Disciplinary Undergraduate Research Assistant award by the UMN Digital Arts, Sciences, and Humanities (DASH) Program and the Undergraduate Research Scholarship program.	Spatial Data Visualization
2017	\$1500	Spring 2018 Undergraduate Research Opportunities Program (UROP)	Visual Analytics of Movement Data for Research and Education.

Year	fund	University of Colorado Colorado Springs program	project
2015	\$1200	Dean of LAS Summer Student Research Stipend: to mentor undergraduate research.	Modeling movement of tigers (<i>Panthera tigris</i>) in relation to the environment
2015	\$5,171	Committee on Research and Creative Works (CRCW) seed grant.	Understanding the relationship between movement, behavior and the environment: A case study on tigers (<i>Panthera tigris</i>) in West-Central Thailand
2014	\$4,000	Dean of LAS Student-Faculty Research, Creative Works & Community Service Award.	Visual Analytics to Study Movement in a Geographic Context
2014	\$1200	Dean of LAS Summer Student Research Stipend.	Visualization of Animal Movement and the Environment

European Research Grants

- 2011 EUR 2,100 Short Term Scientific Mission, the European COST Action IC0903: for a STSM at the Technical University of Eindhoven
- 2010 CHF 80,532 Research Fund (Forschungskredit) of the University of Zurich: Personal Postdoctoral Research Grant for the project: “CONSIST: CONtext dependent SIMilarity Search in Traveler movement”

Travel Grants

Year	fund	Funding Institution
2018	\$100	Gordon Research Conferences
2017	EUR 400	Schloss Dagstuhl
2016	\$1000	National Science Foundation
2010	EUR 600	European COST Action IC0903
2009	CHF 2,000	Mentoring Project of the University of Zurich
2009	CHF 600	Zurich Graduate School in Geography

COURSES TAUGHT**Courses at the University of Minnesota (since 2016)**

- GEOG 5900-002 Advanced Cartography and Geovisualization (3 credit hours)
- GEOG 5563 Advanced Geographic Information Sciences (3 credit hours)
- GEOG 1911 Digital Earth (3 credit hours)
- GEOG 8294 Spatiotemporal Modeling and Simulation (3 credit hours)

Courses at the University of Colorado Colorado Springs (2013 – 2015)

- GES 4050/5050 Introduction to GIS (4 credit hours, graduate and undergraduate course)
- GES 4080/5080 Advanced GIS (4 credit hours, graduate and undergraduate course)
- GES 4070/5070 Geovisualization (4 credit hours, graduate and undergraduate course)
- GES 4120/5120 Internet GIS (4 credit hours, graduate and undergraduate course)
- GES 2050 Digital Earth (3 credit hours, undergraduate course)

RECOGNITIONS**Research Impact**

- 847 scholarly citations, h-index 11 (Google scholar¹)
- the most highly viewed article in the Journal of *Movement Ecology*'s history (over 19900 accesses and 93 citations) and designated 'highly accessed' on BioMed Central (<http://www.movementecologyjournal.com/mostviewed/alltime>).
- 2013 article in the Journal of *Movement Ecology* featured as a milestone for movement ecology research (<http://www.movementecologyjournal.com/content/1/1/1>)
- 2013 article in the Journal of *Movement Ecology* featured in ScienceDaily (<http://www.sciencedaily.com/releases/2013/07/130703160615.htm>)

Invitations

- 2017 Invitation to the 2018 Gordon Research Conference on Predator-Prey Interactions, Ventura, CA.
- 2017 Invitation to the workshop on Movement: New Sensors, New Data, New Challenges, Leiden University, NL.
- 2017 Invited Keynote Speaker, NSF Mobility Workshop, The Ohio State University, Columbus, OH.
- 2016 Dagstuhl Seminar 16022: Geometric and Graph-based Approaches to Collective Motion, Germany.
- 2016 British Royal Society meeting on Capturing Individual behavior from Animal Movement Data, UK.
- 2015 Invitation to Vespucci Institute on Advancing GIScience: The Past and Next Twenty Years.
- 2014 Symposium on Animal Movement and the Environment.
- 2013 Dagstuhl Seminar 13492: Geosensor Networks: Bridging Algorithms and Applications.
- 2012 Dagstuhl Seminar 12512: Representation, Analysis and Visualization of Moving Objects.
- 2009 Dagstuhl Seminar 08451: Representation, Analysis and Visualization of Moving Objects.

¹<https://scholar.google.com/citations?user=vDaqmVQAAAAJ&hl=en>

UNIVERSITY SERVICES

Services to the University of Minnesota

- 2017 – 2018 CLA Career Readiness Faculty Fellow
 2017 Outreach to the UMN Girls Who Code program.

Services to the UMN Department of Geography, Environment, and Society

- 2017 – 2018 GES Department Equity and Diversity Committee
 2017 – 2018 GES Department Merit/Faculty Research Committee
 2016 – . MGIS program Executive Committee and Graduate Faculty
 2016 – 2017 GES Department Undergraduate Education Policy Committee

Services to University of Colorado Colorado Springs

- 2014 – 2016 Director, Geospatial Research Lab
 2014 – 2016 Research Committee, College of Letters, Arts & Sciences (LAS).
 2014 – 2016 Appointed Diversity Champion for Faculty Search Committees
 2014 – 2016 UCCS Department of Geography and Environmental Studies Graduate Faculty
 2014 – 2015 UCCS Department of Mechanical and Aerospace Engineering (MAE) tenure track Search Committee. Served as Diversity Champion.

Thesis Committee Member

- Examiner of PhD thesis: Rahul Deb Das (University of Melbourne, 2017).
- External Committee member of PhD thesis: David Lamb (University of South Florida, 2015–17).
- Committee member of PhD thesis: Min Jung Kim (UMN Carlson School of Management, 2017).
- Main advisor of MA thesis, UCCS: Wyatt Norris (2014–2016).
- Committee member of MA thesis, UCCS: Shannon Thomas (2015–16), Justin Cook (2015), Dustin Kanus (2014), David Sturgis (2013).

Undergraduate Student Advising/Mentoring

- Senior projects: Fall 2017 (Jonathan Lofquist, Arie Peterson, Ya Tao)
- Honors projects: Glenn Xavier (2015 at UCCS), Ethan Van Offelen (Spring 2017).
- Undergraduate Research: Wing Yi (Pinki) Wong (UROP 2017-18), Kerri Newcomer (DASH/URS Spring 2018).

SERVICE TO BROADER SCIENTIFIC COMMUNITY

Professional Organizations

- 2016 – 2017 UCGIS Knowledge Area Editor for the GIS&T Body of Knowledge 2.0.
 2013 – 2015 Elected Academic Councilor, Geographic Information Science and Systems (GISS) Specialty Group, Association of American Geographers.
 2012 – 2014 Scientific Secretary of the ISPRS Technical Commission II, Working Group II/8: “Mobility: tracking, analysis and communication”.
 2011 Scientific Coordinator, the European COST Action IC0903: MOVE (<http://move-cost.info/>).

Editorships

- 2017 Guest editor of the International Journal of Geographical Information Science. Special issue on “Computational Movement Analysis”.
- 2016–17 UCGIS Editorial Board of the Geographic Information Science and Technology Body of Knowledge.
- 2015–16 Guest editor of the International Journal of Geographical Information Science. Special issue on “Progress in Movement Analysis”.

Workshop and Seminar Organizer

- 2017 Dagstuhl Seminar 17282 on “From Observations to Prediction of Movement”, Wadern, Germany.
- 2016 GIScience’16 workshop on Analysis of Movement Data (AMD’16), Montreal, Canada.
- 2016 AAG Symposium on Human Dynamics Research: Analysis of Movement Data, San Francisco, CA.
- 2015 AAG GIS Specialty Group Student Paper Competition, Chicago, IL.
- 2014 GIScience’14 workshop on Analysis of Movement Data (AMD’14), Vienna, Austria.
- 2014 AAG GIS Specialty Group Student Paper Competition, Tampa, FL.
- 2012 NASA Biological Response to Climate Change - Track Annotation, Denali Education Center (<http://www.denali.org/>), Alaska.

Scientific Program Committee

- 2018 GIScience 2018: the 10th International Conference on Geographic Information Science
- 2016–17 NSF funded workshops on Advancing Movement and Mobility Science by Bridging Research on Human Mobility and Animal Movement Ecology
- 2016 GIScience 2016: the 9th International Conference on Geographic Information Science
- 2016 XXIII ISPRS Congress
- 2016 AGILE workshop on Visually-supported Computational Movement Analysis (VCMA 2016)
- 2014–15 AAG Geographic Information Science and Systems Specialty Group Annual Student Paper Competition
- 2014 GIScience 2014 workshop on Analysis of Movement Data (AMD’14)
- 2014 Joint International Conference on Geospatial Theory, Processing, Modeling and Applications & ISPRS Technical Commission II Midterm Symposium
- 2013 The 6th ACM SIGSPATIAL International Workshop on Computational Transportation Science (IWCTS’13)
- 2013 ISPRS Workshop “Image Sequence Analysis for Object and Change Detection” (ISA’13)

Session Chair, Panelist, and Discussant

- Chair of Paper Session: Collective movement within context, *NSF Workshop on Analyzing Movement and Mobility Within Geographic Context*, The OSU, 12 May 2017.
- Panelist for the IJGIS Special Issues session at *the AAG Annual Meeting 2017*, April 5-9, 2017, Boston, MA.
- Panelist for the *NSF funded workshop on measuring and analyzing interactions among mobile entities*, UT Austin, November 2016.
- Chair of Paper Session: Algorithms 2, GIScience conference 2016, September 28, Montreal, Canada.
- Discussant for Paper Session: Symposium on Human Dynamics Research: Modeling Human Dynamics, the AAG Annual Meeting 2016, San Francisco, CA.
- Discussant for Paper Session X – Resource Tracking and Management, *Advancing Geographic Information Science: The Past and Next Twenty Years*. 2015 Vespucci Institute. College of the Atlantic, Bar Harbor, ME.
- 2015 GIS Specialty Group Student Paper Competition, the AAG Annual Meeting 2015, Chicago, IL.
- Keynote Session, GIScience’14 workshop on Analysis of Movement Data (AMD’14), Vienna, Austria.

- Tutorial session: “track segmentation & interactions”, Symposium on Animal Movement and the Environment, May, 2014, Raleigh, NC.
- 2014 GIS Specialty Group Student Paper Competition Session I & II, the AAG Annual Meeting 2014, Tampa, FL.
- Chair of Paper Session: “Trajectories, Time Geography, and Uncertainty”, the AAG Annual Meeting 2012, New York, NY.

External Reviewer

- US National Science Foundation (NSF)
 - Measurement, Modeling, Statistics (MMS) Program (2017)
 - Geography and Spatial Sciences (GSS) Program (2012)
- International Journals
 - *Geography and GIScience journals*: International Journal of Geographical Information Science, Cartography and Geographic Information Science, Journal of Geovisualization and Spatial Analysis, Journal of Geographical Analysis, Journal of Spatial Information Science, Transactions in GIS, ISPRS International Journal of Geo-Information, Journal of Geographical Systems, Journal of Applied Geomatics
 - *Ecology journals*: Ecological Modelling, Bulletin of the American Meteorological Society, PLOS ONE, Journal of Movement Ecology
 - *Computer Science journals*: Information Visualization, ACM Computing Surveys, Journal of Location Based Services, Journal of Computers, Environment and Urban Systems, Applied Mathematics and Computation, Sensors
 - *Transportation journals*: Journal of Transportation Research Part C: Emerging Technologies

SPECIALIZED TRAININGS TO ADVANCE RESEARCH AND TEACHING SKILLS

Specialized Summer Schools and Workshops

- Colorado Learning and Teaching with Technology Conference (COLTT'15), 5 – 6 August, University of Colorado, Boulder, CO.
- ESRI User Conference 2015, 20 – 24 July, San Diego, CA.
- The University Consortium for Geographic Information Science (UCGIS) Symposium 2015, 27 – 30 May, Alexandria, VA.
- AAG Geography Faculty Development Alliance Workshop, University of Connecticut, 22 - 28 June 2014, Storrs, CT.
- Education for a Sustainable Future: Addressing Climate Change, Social Justice and Sustainability Across the Entire University Curriculum. UCCS Faculty Workshop. 12 February 2014. Colorado Springs, CO.
- UCGIS 2013 Symposium, 20 - 24 May 2013, George Mason University, Washington, DC.
- IPR "Big Data" Workshop, 9 May 2013, Institute for Population Research, the Ohio State University, Columbus, OH.
- Workshop on Progress in Movement Analysis, Experiences with Real Data, 15 - 16 November 2012, Zurich, Switzerland.
- Unidata Users Workshop 2012: Navigating Earth System Science Data, 9 - 13 July, NCAR, Boulder, CO.
- Multidisciplinary Workshop on Analysis and Visualization of Moving Objects, 27 June - 1 July, 2011, Lorentz Center, Leiden, Netherlands.

- Seminar on Mobility and Time Geography by Professor Harvey J. Miller (University of Utah), 2010, Zurich Graduate School in Geography, University of Zurich, Switzerland.
- First Summer School on “Mobility, Data Mining, and Privacy”, 27 August - 1 September 2010, Rhodes Island, Greece.
- Dagstuhl Seminar on “Representation, Analysis and Visualization of Moving Objects”, 2 - 7 November 2008, Leibniz Center for Informatics, Germany.

Professional Development Courses

University of Minnesota, Twin Cities (since 2016):

Fall 2017: CLA Career Readiness Faculty Fellow program

Spring 2017: New Faculty Program, Career Readiness Faculty Workshop, Metacognition: Strategies for Helping Students Learn How to Learn, Enhancing Scholarship through Community-Engaged Research and Teaching.

Fall 2016: Too Much Information: Maximizing Student Learning BY Minimizing Cognitive Load, Building effective peer response activities, Faculty Grant Writing Workshop for Social Science Research, CLA Grant Writing Info Session

University of Colorado, Colorado Springs (2013 – 2014):

Copyright for Faculty Authors, Grant Writing Workshop with the Office of Sponsored Programs and Research Integrity (OSPRI), Grant Writing Workshop with Tony DePass, Advanced student employee supervisor training, The BIG Idea Building Inclusiveness Workshop, Diversity Champion Training, SaVE Violence Prevention Education, Blackboard Boot Camp

The Ohio State University Center for the Advancement of Teaching (2012 – 2013):

Course Design Institute, Planning a Class Session, Designing Assignments, Quizzes, and Tests

University of Zurich (2007 – 2011):

Supervising students, dealing with roles and relationships, Project Management for Research, Acquisition of Research Grants, Scientific Presentation Course, Writing English for Science