

Caglar Koylu

Assistant Professor

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EDUCATION

- 2014 **Ph.D., Geography**
University of South Carolina, Columbia, SC
Dissertation: Understanding Geo-Social Network Patterns: Computation, Visualization, and Usability (Advisor: Diansheng Guo)
- 2008 **M.S., Geodetic and Geographic Information Technologies (GGIT)**
Middle East Technical University (METU), Ankara, Turkey
- 2004 **B.S., City and Regional Planning**
METU, Ankara, Turkey

EMPLOYMENT

- 2015 - present **Assistant Professor**
Department of Geographical and Sustainability Sciences,
Informatics Cluster Initiative, University of Iowa
- 2015 **Post-Doctoral Research Associate**
Department of Geography, University of South Carolina
- 2008 – 2014 **Research Assistant, Instructor, Teaching Assistant**
Department of Geography, University of South Carolina
- 2005-2008 **Database Specialist / Development Team Leader**
INTA Spaceturk (Ground Station Owner of Satellite IKONOS), Ankara, Turkey

TEACHING

- 2015 - present **University of Iowa, Iowa City, IA**
Foundations of Geographic Information Science
Introduction to Geographic Visualization
Introduction to Geographic Databases
Graduate Seminar in Spatial Analysis and Modeling
- 2012 – 2013 **University of South Carolina, Columbia, SC**
Introduction to Geographic Information Systems (GIS) (Instructor)
Advanced Geographic Information Systems (GIS) (Teaching Assistant)

JOURNAL PUBLICATIONS

- Xu, H., Demir, I. **Koylu, C.** & Muste, M. (In Revision) A web-based visual analytics framework for identifying potential contributors to culvert sedimentation, *Environmental Modelling & Software*
- Zhu, X., Guo, D., **Koylu, C.** & Chen, C. (In Revision) Density-Based Multi-scale Flow Mapping and Generalization, *Computers, Environment and Urban Systems*.
- 2019 **Koylu, C.**, Zhao, C. & Shao, W. (2019). Deep neural networks and kernel density estimation for detecting human activity patterns from geo-tagged images: A case study of birdwatching on Flickr, *International Journal of Geo-Information*, 8(1), 45. DOI: <https://doi.org/10.3390/ijgi8010045>
- 2019 Sit, M., **Koylu, C.** & Demir I. (2019). Identifying disaster related tweets and their semantic, spatial and temporal context using deep learning, natural language processing and spatial analysis: A case study of Hurricane Irma, *International Journal of Digital Earth*. DOI: <https://doi.org/10.1080/17538947.2018.1563219>
- 2019 **Koylu, C.**, Larson, R., Dietrich, B. & Lee, K.P. (2019) CarSenToGram: Geovisual text analytics for exploring spatio-temporal variation in public discourse on Twitter, *Cartography and Geographic Information Science*, 46:1, 57-71, DOI: <https://doi.org/10.1080/15230406.2018.1510343>
(Featured on the cover)
- 2018 **Koylu, C.**, Delil, S., Guo, D. & Celik, R.N. (2018) Analysis of Big Patient Mobility Data for Identifying Medical Regions, and Spatio-temporal Characteristics and Care Needs of Patients on the Move, *International Journal of Health Geographics*, vol.17, p.32.
DOI: <https://doi.org/10.1186/s12942-018-0152-x>
- 2018 **Koylu, C.** (2018) Modeling and visualizing semantic and spatio-temporal evolution of topics in interpersonal communication on Twitter, *International Journal of Geographical Information Science*.
DOI: <https://doi.org/10.1080/13658816.2018.1458987>
- 2017 **Koylu, C.** & Guo, D. (2017). Design and evaluation of line symbolizations for origin–destination flow maps. *Information Visualization*, 16(4), 309-331.
DOI: <https://doi.org/10.1177/14738716166681375> **(Featured on the cover)**
- 2014 **Koylu, C.**, Guo, D., Kasakoff, A., & Adams, J. W. (2014). Mapping family connectedness across space and time. *Cartography and Geographic Information Science*, 41(1), 14-26 DOI: <https://doi.org/10.1080/15230406.2013.865303>
(Featured on the cover)

- 2013 **Koylu, C.** & Guo, D. (2013). Smoothing locational measures in spatial interaction networks. *Computers, Environment and Urban Systems*, 41(0), 12-25. DOI: <https://dx.doi.org/10.1016/j.compenvurbsys.2013.03.001>

BOOK CHAPTERS

- 2018 **Koylu, C.** (2018). Uncovering geo-social semantics from the Twitter mention network: An integrated approach using spatial network smoothing and topic modeling, “*Human Dynamics Research in Smart and Connected Communities*”, Human Dynamics in Smart Cities. Springer, Cham. DOI: https://doi.org/10.1007/978-3-319-73247-3_9
- 2018 **Koylu, C.** (2018). Discovering Multi-Scale Community Structures from the Interpersonal Communication Network on Twitter. In L. Perez, E.-K. Kim, & R. Sengupta (Eds.), *Agent-Based Models and Complexity Science in the Age of Geospatial Big Data: Selected Papers from a workshop on Agent-Based Models and Complexity Science (GIScience 2016)* (pp. 87-102). Cham: Springer International Publishing. DOI: https://doi.org/10.1007/978-3-319-65993-0_7

PEER REVIEWED CONFERENCE PUBLICATIONS

- 2018 **Koylu, C.**, Dietrich, B. & Larson, R. (2018). Geovisual text analytics for exploring public discourse on Twitter: A case study of immigration tweets before and after the January 27, 2017 Travel Ban, *AutoCarto/UCGIS International Research Symposium*, May 24, 2018 Madison, Wisconsin.
- 2016 **Koylu, C.** (2016). Extracting and Visualizing Geo-Social Semantics from the User Mention Network on Twitter. *Proceedings of GIScience 2016 Workshop on Rethinking the ABCs: Agent-Based Models and Complexity Science in the age of Big Data, CyberGIS, and Sensor Networks*, Montreal, Canada, September 27, 2016.
- 2015 Guo, D., Kasakoff, A. B., **Koylu, C.**, Huang, Y., & Grieve, J. (2015) “Historical Population Informatics: Comparing Big Data of Family Trees and the U.S. 1880 Census for Migration Analysis” *Population Informatics for Big Data (PopInfo'15) in conjunction with the 21st ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, August 10, 2015, Sydney
- 2012 **Koylu, C.** Guo, D., and Kasakoff, A. “Mapping social relationships across space and time”, *AutoCarto International Research Symposium*, September 17, 2012 Columbus, Ohio.

GRANTS AND FUNDING

- 2018 Investigator, *The People's Weather Map and Social Media: Iowans Talking about Weather Hazards*, Summer Research Collaboration, Digital Bridges for Humanistic Inquiry: A Grinnell College/ University of Iowa Partnership, Andrew W. Mellon Foundation, with Barbara Eckstein, Professor of English at the University of Iowa and Casey Oberlin, Assistant Professor of Sociology at the Grinnell College, \$10,000, 5/1/2018 – 12/1/2018.
- 2018 Investigator, *Distinguishing high-crime neighborhoods from low-crime neighborhoods: A spatial examination integrating a diversity of social and ecological factors*, Interdisciplinary Research Grant with James Wo, Assistant Professor of Sociology at the University of Iowa, Obermann Center for Advanced Studies, \$12,000, 7/15/2018 – 8/15/2018.

AWARDS

- 2017 Honorable mention with Chang Zhao in Best Paper Competition 2017 International Symposium on Spatiotemporal Computing at Harvard, August 7-9 2017.
- 2015 Finalist in the 2015 AAG GIS Specialty Group (GISSG) Honors Competition for Student Papers in Geographic Information Science.
- 2014 Toxic Release Inventory Program (TRI) 2014 University Challenge Academic Partner (Primary researcher: Diansheng Guo)
- 2013 Finalist in the 2013 AAG Cartography Specialty Group Honors Competition for Student Papers
- 2012 The second place in the 2012 AAG GIS Specialty Group (GISSG) Honors Competition for Student Papers in Geographic Information Science.
- 2011 The Paul E. Lovingood Award: Outstanding Graduate Student Paper, University of South Carolina, Department of Geography

INVITED PRESENTATIONS

- 2018 “Understanding complex patterns from big spatial interaction (flow) data: A computation-visualization framework”, at the *University of Chicago, Center for Spatial Data Science, October 23, 2018*.
- 2017 “Analysis of big longitudinal patient mobility data for evaluating the efficiency of a health care system”, at the *University of Iowa, Department of Biostatistics, October 9, 2017*.

- 2017 “Discovering complex patterns from social media data: Space-time, semantics, and network structures”, *at the University of Iowa, Center for Global and Regional Environmental Research, September 18, 2017.*
- 2016 “Information visualization, utility and usability”, *at the University of Iowa, Iowa Flood Center, December 2, 2016.*
- 2016 “Uncovering geo-semantics of interpersonal communication on Twitter”, *at the University of Iowa, Department of Computer Science, November 11, 2016.*
- 2016 “Geographic Information Science and its applications in public health”, *at the University of Iowa, College of Nursing, September 13, 2016.*
- 2015 “Understanding complex patterns from massive geographic mobility data: a network smoothing approach”, *at the University of Iowa, Department of Management Sciences, October 23, 2015.*
- 2015 “Understanding geo-social network patterns: computation, visualization and usability”, *at the University of Kansas, February 12, 2015.*
- 2015 “Understanding complex patterns from massive geographic mobility data: a network smoothing approach”, *at the University of Iowa, February 3, 2015.*
- 2015 “Understanding geo-social network patterns: computation, visualization and usability”, *at West Virginia University, January 26, 2015.*
- 2015 “Understanding geo-social network patterns: computation, visualization and usability”, *at the University of Colorado, Boulder, January 22, 2015.*
- 2015 “Understanding locational patterns in large geo-social networks: A network smoothing approach”, *at the University of Wisconsin, La Crosse, January 8, 2015.*
- 2014 “Understanding geo-social network patterns: computation, visualization and usability”, *at Appalachian State University, North Carolina, December 8, 2014.*
- 2013 “Analyzing and understanding large and complex spatial interaction data using a graph-theoretic approach”, *at Oak Ridge National Laboratory (ORNL), April 23, 2013.*

CONFERENCE AND WORKSHOP PRESENTATIONS

- 2018 Wo, J., **Koylu, C.**, & Berg, M.T. (2018). Understanding Neighborhood Crime: An examination of different predictors, *the American Society of Criminology Annual Meeting*, November, 2018 Atlanta, Georgia.
- 2018 **Koylu, C.**, Dietrich, B. & Larson, R. Geovisual text analytics for exploring public discourse on Twitter: A case study of immigration tweets before and after the January 27, 2017 Travel Ban, *CaGIS AutoCarto and UCGIS Symposium* May 24, 2018, Madison, WI

- 2018 **Koylu, C.** “Analysis of Big Longitudinal Patient Mobility Data for Evaluating the Efficiency of a Health Care System”, *AAG Annual Meeting, Advances in Computational Approaches for Geospatial Health Applications*, April 11, 2018, New Orleans, LA
- 2017 Zhao, C., **Koylu, C.**, Sander, H. “Watching the birdwatchers on Flickr: An adaptive kernel smoothing approach for visualizing spatiotemporal patterns of a cultural ecosystem service”, *2017 International Symposium on Spatiotemporal Computing at Harvard, August 7-9 2017*.
- 2017 **Koylu, C.** “Integrating Topic Modeling and Network Smoothing to Uncover Space-Time Semantics of Interpersonal Communication: An Analysis Of Twitter User Mentions”, *International Symposium on Location-based Social Media and Tracking Data, A Pre-conference Symposium of ICC 2017*, July 2, 2017, Washington, D.C.
- 2017 **Koylu, C.** “Uncovering geosemantics of interpersonal communication on Twitter”, *AAG Annual Meeting, Spatial Data Mining and Big Data Analytics*, April 9, 2017, Boston, MA
- 2016 **Koylu, C.** “Extracting and Visualizing Geo-Social Semantics from the User Mention Network on Twitter” *Proceedings of GIScience 2016 Workshop on Rethinking the ABCs: Agent-Based Models and Complexity Science in the age of Big Data, CyberGIS, and Sensor Networks*, September 27, 2016, Montreal, Canada
- 2016 **Koylu, C.** Guo, D. “Utility and Usability Evaluation of Bézier Curves for Flow Map Design”, *AAG Annual Meeting, Spatial Data Mining and Big Data Analytics*, March 29, 2016, San Francisco, CA
- 2015 **Koylu, C.** “A Spatio-Temporal Approach to Extracting and Visualizing Topics from Twitter”, *AAG Annual Meeting, GIS Specialty Group Honors Student Paper Competition*, April 24, 2015, Chicago, Illinois
- 2014 **Koylu, C.** “Spatial and temporal patterns of topics on Twitter during social movements”, *AAG Annual Meeting, Business Geography – Social Media*, April 11, 2014, Tampa, Florida
- 2014 **Koylu, C.**, Guo, D., Kasakoff A., and Bras, H. “Understanding geo-social network patterns from large ego-centric networks”, *Geographic and Social Space, The XXXIV Sunbelt Social Networks Conference, International Network for Social Network Analysis (INSNA)*. St. Pete Beach, FL, USA. Feb 18-22.
- 2013 Bras, H. , **Koylu, C.**, Guo, D., and Kasakoff A. “Visualizing witness relations across space and time”, *The Social Science History Association Annual Meeting, “Seeing” Family Patterns in Time and Space*, November 23, 2013, Chicago, Illinois

- 2013 **Koylu, C.**, Guo, D., and Kasakoff, A. “Mapping family connectedness across space and time”, *The Social Science History Association Annual Meeting*, “Seeing” Family Patterns in Time and Space, November 23, 2013, Chicago, Illinois
- 2013 Bras, H., **C. Koylu**, A. Kasakoff, and D. Guo. “Visualizing historical kinship networks using data from marriage registers: The Netherlands, 1830-1950”, *The XXXIII Sunbelt Social Networks Conference, International Network for Social Network Analysis (INSNA)*. Hamburg, Germany. May 21-26.
- 2013 **Koylu, C.** “Implementing and evaluating a web-based flow mapping application”, *AAG Annual Meeting, Cartography Specialty Group Student Honors Paper Competition*, April 10, 2013, Los Angeles, California
- 2012 **Koylu, C.** “Mapping social relationships across space and time”, *AutoCarto International Research Symposium*, September 17, 2012 Columbus, Ohio
- 2012 **Koylu, C.** “A visual analytics approach to animating dynamic spatial networks”, *GIScience 2012 Workshop: GeoVisual Analytics, Time to Focus on Time*, September 18, 2012 Columbus, Ohio
- 2012 **Koylu, C.** “Smoothing locational measures in spatial interaction networks”, *AAG Annual Meeting, GIS Specialty Group Honors Student Paper Competition*, February 27, 2012, New York, New York
- 2011 **Koylu, C.**, Emrich, C., and Cutter, S. “A spatial knowledge discovery approach to analyzing regional variability of security threats in the United States”, *AAG Annual Meeting, Quantitative Approaches to Hazards and Vulnerability*, April 12, 2011, Seattle, Washington
- 2010 **Koylu, C.** “Using Centrality Measures to Discover Structural Characteristics of Migration Data”, *AAG Annual Meeting, Spatial Data Mining and Exploratory Data Analysis (1)*, April 16, 2010, Washington, D.C.
- 2009 **Koylu, C.** “A Spatial Data Warehouse Model for Weather Pattern Searching”, *AAG Annual Meeting, Spatial Data Mining and Exploratory Data Analysis (2)*, March 22, 2009, Las Vegas, NV.

ADVISEES

- 2022 (Expected) Amariah Fischer (Ph.D. in Geography)
- 2022 (Expected) Hoeyun Kwon (Ph.D. in Geography)
- 2020 (Expected) Bin Zhang (M.S. in Geoinformatics)

THESIS/DISSERTATION COMMITTEE MEMBER

- Seungwon Kim (Ph.D. in Geography)
- Haoyi Xiong (Ph.D. in Geography)

- Oronde Drakes (Ph.D. in Geography)
- Federico Antolini (Ph.D. in Geinformatics)
- Zhijiang Liu (Ph.D. in Statistics)
- Amin Vahedian Khezerlou (Ph.D. in Management Sciences)
- Cody Hodson (Ph.D. in Geography)
- Kangsan Lee (M.S. in Geography)
- 2019 Haowen Xu (Ph.D. in Civil and Environmental Engineering)
- 2018 Christine Bricker (Ph.D. in Political Science)
- 2018 Kevin Matthews (Ph.D. in Geography)
- 2018 Jeffrey Koss (M.S. in Geography)
- 2018 Zach Palmer (M.S. in Geography)
- 2018 Austin Rau (M.S. in Geography)
- 2017 Junchuan Fan (Ph.D. in Geography)
- 2017 Kain Kutz (M.S. in Geography)

SOCIETY MEMBERSHIP

- 2008 - Association of American Geographers (AAG)
- 2014 - Cartography and Geographic Information Society (CaGIS)
- 2016 - The Center for Global and Regional Environmental Research (CGRER)
- 2018 - University Consortium for Geographic Information Science (UCGIS)

PROFESSIONAL SERVICE

- 2018 – present Secretary, Cartography and Geographic Information Society (CaGIS)
- 2018 – present Ad Hoc Reviewer, National Science Foundation (NSF)

Conference Special Session Organizer / Moderator

- 2017 International Symposium on Location-based social media data and tracking data
– A pre-conference symposium of ICC 2017, Washington D.C., July 1-2, 2017
(Moderator)
- 2017 Spatial Data Mining and Big Data Analytics, 113th AAG Annual Meeting,
Boston, MA, April 5 – April 9, 2016 (Organizer, Moderator)
- 2016 GeoSocial Networks and Graphs, 9th International Conference on Geographic
Information Science, Montreal, Canada, September 28, 2016 (Moderator)
- 2016 Spatial Data Mining and Big Data Analytics, 112th AAG Annual Meeting, San
Francisco, CA, March 29 – April 2, 2016 (Organizer, Moderator)

Reviewer for Journals (year[times])

Int. J. of Geographical Information Science (IJGIS)	2019[1], 2016[1], 2015[2]
Cartography and Geographic Information Science (CaGIS)	2017[4], 2014[2]
Transactions in GIS	2019[1], 2017[1]
Journal of Maps	2018[1], 2017[1]
ISPRS International Journal of Geo-Information	2019[1], 2018[2]
IEEE Transactions on Visualization and Computer Graphics (TVCG)	2016[1]
BMJ Open	2018[1]
PLOS One	2018[1]
Geoinformatica	2018[1]
Journal of Urban, Planning and Transport Research	2014[1]

Department / College / University Service

2018 – present	Interdisciplinary Graduate Program in Applied Mathematical and Computational Sciences (AMCS), Faculty
2018 – present	Center Affiliated Faculty for UI Center for Advancing Multimorbidity Science (CAMS), College of Nursing
2017 – present	Interdisciplinary Graduate Program in Informatics (IGPI) Strategic Planning Committee, Member
2017 – 2018	Faculty Assembly, Geographical and Sustainability Sciences (GSS) Member
2016 – present	CGRER Seed Grant Proposal Review, Reviewer, Grant Proposals
2015 – present	Graduate Program Committee, GSS, Member
2015 – present	GSS, Geographic Information Systems Instructional Lab (GISIL), Director
2015 – present	Geoinformatics Coordinator in Informatics and Coordinating Committee Member in Geoinformatics Subprogram