Caglar Koylu

Assistant Professor

Department of Geographical and Sustainability Sciences, University of Iowa

316 Jessup Hall Iowa City, IA 52242   Phone: 319-335-0161 Fax: 319-335-2725

e-mail: caglar-koylu@uiowa.edu   web: www.geo-social.org

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, 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
	Geospatial Programming
	Geographic Visualization
	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

2020   **Koylu, C**., Guo, D., Huang, Y., Kasakoff, A. B., & Grieve, J. (2020) Connecting family trees to construct a population-scale and longitudinal geo-social network for the U.S., *International Journal of Geographical Information Science.* DOI: https://doi.org/10.1080/13658816.2020.1821885

2019   Zhu, X., Guo, D., **Koylu, C.** & Chen, C. (2019) Density-Based Multi-scale Flow Mapping and Generalization, *Computers, Environment and Urban Systems, 77, 101359.* DOI: https://doi.org/10.1016/j.compenvurbsys.2019.101359

2019   Xu, H., Demir, I. **Koylu**, **C.** & Muste, M. (2019) A web-based geovisual analytics platform for identifying potential contributors to culvert sedimentation, *Science of the Total Environment, 692, 806-817,* DOI: https://doi.org/10.1016/j.scitotenv.2019.07.157

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, *ISPRS 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)**

2019   **Koylu, C.** (2019) Modeling and visualizing semantic and spatio-temporal evolution of topics in interpersonal communication on Twitter, *International Journal of Geographical Information Science, 33:4, 805-832,* DOI: https://doi.org/10.1080/13658816.2018.1458987

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*, *17(1), 32,* DOI: https://doi.org/10.1186/s12942-018-0152-x

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/10.1177/1473871616681375 **(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 (*denotes advisee)

2020   **Koylu, C.**, & Kasakoff, A. (2020). Mapping Temporal Trends of Parent-Child Migration from Population-Scale Family Trees, *AutoCarto 2020 - The 23rd International Research Symposium on Cartography and GIScience,* November 18, 2020, World Wide Web.

2020   Zhang, B.* & **Koylu, C.** (2020). Identifying Vulnerabilities in Multilayer Spatial Networks: A Case Study of Food Flows in The United States, *AutoCarto 2020 - The 23rd International Research Symposium on Cartography and GIScience,* November 18, 2020, World Wide Web.

2019   Kasakoff, A. B., **Koylu, C.,** Huang, Y., & Guo, D.(2019) "Changes in kin proximity in the 19th Century United States" *International Seminar on Kinship and Reproduction in Past Societies*, August 22, 2019, Minneapolis.

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

2019   Co-Principal Investigator, *Project Haystack*, GoDaddy Inc., with PI Caroline Tolbert, Political Science, University of Iowa, $234,491, 8/1/18 – 8/1/20.

2019   Investigator, *Distinguishing high-crime neighborhoods from low-crime neighborhoods: A socio-spatial examination integrating a diversity of social and ecological factors,* Public Policy Center, University of Iowa, with James Wo, Assistant Professor of Sociology and Mark Berg, Associate Professor of Sociology, $3,000, 7/22/2019 – 8/19/2019.

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 Grinnel 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 (*denotes advisee)

2020	**Koylu, C.**, & Kasakoff, A. (2020) "Mapping Temporal Trends of Parent-Child Migration from Population-Scale Family Trees", *AutoCarto 2020 - The 23rd International Research Symposium on Cartography and GIScience,* November 18, 2020, World Wide Web.
2020	Zhang, B.* & **Koylu, C.** (2020) "Identifying Vulnerabilities in Multilayer Spatial Networks: A Case Study of Food Flows in The United States", *AutoCarto 2020 - The 23rd International Research Symposium on Cartography and GIScience,* November 18, 2020, World Wide Web.
2019	Kasakoff, A. B., **Koylu, C.,** Huang, Y., & Guo, D.(2019) "Using Crowd Sourced Family Trees to Understand Changes in Family Connectedness in the 19th Century United States", *The Social Science History Association Annual Meeting*, Living Arrangements and Family Connections, November 23, 2019, Chicago, Illinois.
2019	Kasakoff, A. B., **Koylu, C.,** Huang, Y., & Guo, D.(2019) "Changes in kin proximity in the 19th Century United States" *International Seminar on Kinship and Reproduction in Past Societies*, August 22, 2019, Minneapolis.
2019	Kwon, H.* and **Koylu, C.** Empirical evaluation of parameters and models for extracting topics from short text and geotagged social media data, *AAG Annual Meeting, Social Media and Big Data II,* April 3, 2019, Washington D.C.
2019	Zhang, B.*, **Koylu, C.**, Oberlin, K., Eckstein, B. And Kwon, H.* Climate change or natural cycle? Not sure, but it gets 2 hot and 2 cold 4 sure, *AAG Annual Meeting, Symposium on Frontiers in Geospatial Data Science: Synergizing Geospatial Data Science with Domain Applications I: Climate Science,* April 4, 2019, Washington D.C.
2019	Hodgson, M., Li, Z., Piovan, S. and **Koylu, C.** Language and Twitter-based Social Media During Disaster Events, *AAG Annual Meeting, GIScience and Hazards in the Era of Big Data,* April 3, 2019, Washington D.C.
2018	Wo, J., **Koylu, C.**, & Berg, M.T. 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 Fransisco, 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)*. February 18-22, St. Pete Beach, Florida
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)*. May 21-26, Hamburg, Germany.
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, Nevada

ADVISEES

2022 (Expected)	Hoeyun Kwon (Ph.D. in Geography)
2021 (Expected)	Geng Tian (M.A. in Geography)

THESIS/DISSERTATION COMMITTEE MEMBER

-	Asif Rahman (Ph.D. in Geography)
-	Barbara Kagima (Ph.D. in Geography)
-	Seungwon Kim (Ph.D. in Geography)

-	Haoyi Xiong (Ph.D. in Geography)
-	Oronde Drakes (Ph.D. in Geography)
-	Federico Antolini (Ph.D. in Geinformatics)
-	Austin Tang (M.A. in Geography)
2019	Zhijiang Liu (Ph.D. in Statistics)
2019	Amin Vahedian Khezerlou (Ph.D. in Business Administration)
2019	Cody Hodson (Ph.D. in Geography)
2019	Kangsan Lee (M.A. 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 – present	Association of American Geographers (AAG)
2014 – present	Cartography and Geographic Information Society (CaGIS)
2016 – present	The Center for Global and Regional Environmental Research (CGRER)
2018 – present	University Consortium for Geographic Information Science (UCGIS)

PROFESSIONAL SERVICE

2021 – present	Editorial Board Member for the Journal of Cartography and Geographic Information Science (CaGIS)
2018 – present	Secretary, Cartography and Geographic Information Society (CaGIS)
2018 – present	Ad Hoc Reviewer, National Science Foundation (NSF)

Conference Special Session Organizer / Moderator / Program Committee

2020	IEEE VIS 2020 - Information Visualization of Geospatial Networks, Flows and Movement (MoVis) Workshop, Salt Lake City, UT, October 25 – October 30, 2020 (Program Committee / Reviewer)
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)	2021[1], 2020[2], 2019[5], 2016[1], 2015[2]
Cartography and Geographic Information Science (CaGIS)	2020[2], 2019[2], 2017[4], 2014[2]
Transactions in GIS	2020[3], 2019[4], 2017[1]
ISPRS International Journal of Geo-Information	2019[1], 2018[2]
Geoinformatica	2019[1], 2018[1]
Journal of Maps	2018[1], 2017[1]
IEEE Transactions on Visualization and Computer Graphics (TVCG)	2020[1], 2016[1]
PLOS One	2021[1], 2018[1]
International Journal of Health Geographics	2021[1]
The Professional Geographer	2020[2]
Annals of the American Association of Geographers	2019[1]
BMJ Open	2018[1]

Department / College / University Service

2020 - present	Geoinformatics Coordinator and Executive Committee Member in the Interdisciplinary Graduate Program in Informatics (IGPI)
2019 – present	Research Fellow, University of Iowa, Public Policy Center
2019 – present	Undergraduate Program Committee, GSS, Member
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
2015 – present	GSS, Geographic Information Systems Instructional Lab (GISIL), Director
2017 – 2018	Faculty Assembly, Geographical and Sustainability Sciences (GSS) Member
2016 – 2018	CGRER Seed Grant Proposal Review, Reviewer, Grant Proposals
2015 – 2019	Graduate Program Committee, GSS, Member

2015 – 2020   Geoinformatics Coordinator in Informatics and Coordinating Committee Member in Geoinformatics Subprogram