

DEREK DORAN

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EXPERIENCE

Wright State University , Dayton, OH	
Associate Professor, Dept. of Computer Science & Engineering	2018 – Present
Assistant Professor, Dept. of Computer Science & Engineering	2014 – 2018
ABB U.S. Corporate Research , Raleigh, NC	2013
Interim Researcher, Industrial Software Systems (Data Analytics Group)	
Bell Labs, Nokia (formerly Alcatel-Lucent) , Murray Hill, NJ	2011, 2012
Summer Alumnus, Network Performance and Reliability Department	
National Taiwan University , Taipei, Taiwan	2010
<i>National Science Foundation East Asia and Pacific Summer Institutes Fellow</i>	
Dependable Distributed Systems and Networks Laboratory, National Taiwan University	
University of Connecticut , Storrs, CT	2007 – 2014
Research Assistant, Dept. of Computer Science & Engineering	

EDUCATION

University of Connecticut	
Ph.D. Computer Science & Engineering	2014
M.S. Computer Science & Engineering	2012
B.S. Computer Science, <i>Cum Laude</i> , Minor in Mathematics	2007

PROFESSIONAL HONORS AND AWARDS

Excellence in Teaching Award, College of Eng. and Computer Science, Wright State Univ.	2018
Excellence in Research Award, College of Eng. and Computer Science, Wright State Univ.	2018
President's Award for Faculty Excellence: Early Career Achievement Award, Wright State Univ.	2017
Top Reviewer Award, Computers & Security, Elsevier	2017
Early Career Achievement Award, College of Eng. and Computer Science, Wright State Univ.	2016
Best Teaching Paper Runner-up Award, SIGDSA Business Analytics Congress	2015
Best Paper Award, Industry Track, IEEE/ACM Intl. Conf. on Social Network Analysis and Mining	2015
CISE Research Initiation Initiative Award, National Science Foundation	2015
Doctoral Dissertation Fellowship, University of Connecticut	2013
Pre-doctoral Fellowship, University of Connecticut	2013
Best Paper 3 rd Place Award, Intl. Conference on Software Engineering and Knowledge Engineering	2013
Best Paper Award, IEEE Intl. Conference on Machine Learning and Applications	2012
Graduate Research Award, <i>Transportation Research Board of the National Academies</i>	2012
East Asia and Pacific Summer Institutes Fellowship, <i>National Science Foundation</i>	2010
Best Student Paper Nominee, IEEE. Intl. Symposium on Network Computing & Applications	2010
New England Scholar	2007
Upsilon Pi Epsilon Inductee	2006

RESEARCH THRUSTS

Key Areas: Machine learning; Complex systems analysis

Current Interests

+ A Framework for Explainable AI (XAI) Research

We seek to understand the landscape of the explainable AI (XAI) research field, from work prior to DARPA's XAI program to its evolution since its inception. This work has developed important theses about XAI that resonates with the research community: notions of explainability (interpretable, explainable, reasonable); levels of explainability realizable by XAI (opaque, interpretable, comprehensible, reasonable); how context-independent explanation systems may not be fruitful research directions; why XAI should be seen as a layer onto pre-trained models in the wild. *Publications:* [p1]; [C10]. *Talks:* [NIST Ontology Summit 2019]; [Dagstuhl Seminar 2017]

+ Explainable Deep Learning and Neuro-Symbolic Systems

We address the problem of producing forms of explanations of why a DNN maps an input to output. We have and continue to follow multiple directions:

1. We contrast past work, which focuses on recognizing the salient features a DNN recovers, by examining *how salient features are weighted and integrated* in late stage fully connected layers. Explanations are thus based on how features are utilized, rather than just displaying *what* features are utilized. Our work emphasizes topological modeling and analysis of the activation space of fully connected DNN layers to produce a **trust** scores on inputs. *Publications:* [p2]; [C8]; [A1]. *Talks:* [IBM TJ Watson 2017]
2. We produce an explainable deep model of the *visual entailment task*: given an image and a text statement about the image, determine if the statement is supported by visual evidence in the image. Visual masks supported by network attention mechanisms enable users to verify if latent image concepts used internally by the network support its decision. *Publications:* [p3]; [C2]
3. We argue that reasoning is a necessary ingredient to enable the strongest forms of XAI systems and that neuro-symbolic computing and integration is critical. We explore neuro-symbolic systems, including reasoning to create explanatory statements about the relationship of features used when a DNN makes a decision and building DNNs that learn transferrable RDF reasoning. *Publications:* [p6]; [C13].

+ Usable, Explainable Unsupervised Learning by Topological Data Analysis

With a multi-year collaboration with 711th HPW at AFRL, funded under their branch DARPA's XAI program, we investigate the use of topological data analysis to enable explainable unsupervised learning. A basic step in unsupervised learning on big data is a dimensionality reduction or feature transformation that eliminates contextual interpretation of the features used for learning. We explore applications of the Mapper algorithm to efficiently build the 1-skeleton of a simplicial complex of a data set *in the data space, without transforming features*, thus enabling transparent graphical, spatial, and topological analysis of a dataset. We also investigate semi-supervised data augmentation via GANs so that the output of Mapper has higher fidelity to the shape of the data space. *Publications:* [p2]; [J2]; [C1]. *Talks:* [AFRL 2016]; [WSU 2016]; [Ohio Council for Research 2016]

Other Current Interests

+ Dynamic Network Models for Wide-area Geospatial Analysis

Publications: [p4]; [C11]; [C21]; [A3]. *Talks:* [AFRL 2017]

Previous Interests

+ Measuring, Modeling, and Hardening Web Servers Against Web Robot Traffic

+ Emoji Sense Understanding and Disambiguation

+ Social Media Analytics

+ Characterization and Evaluation of Large-scale Sociotechnological Systems

+ Data Science for Business Analytics

RESEARCH GRANTS

- PI: *Geo-Aware Trajectory Generation for SUMO*
NSF I/UCRC Center for Surveillance Research, \$45,000, 2018 – 2019
- PI: *Methods Promoting Usability and Explainability in Applied Topological Data Analysis*
Oak Ridge Institute for Science and Education, \$45,000, 2017 – 2018
- PI: *Dynamic Network Models for Geospatial Awareness*
NSF I/UCRC Center for Surveillance Research, \$40,000, 2017 – 2018
- Co-PI: *Human Centered Big Data*
with M. Raymer (PI), B. Rigling, P. Hitlzer, T. Wishcholl, M. Belkin, J. Hamm, K. Loparo, B. Minnery
Ohio Federal Research Network, \$1,150,793, 2016 – 2018
(Doran's share: \$164,399)
- PI: *Network Representations and Analytics for Geospatial Analysis*
NSF I/UCRC Center for Surveillance Research and Air Force Research Labs, \$84,000, 2016 – 2018
- PI: *CRII: CSR: Towards Understanding and Mitigating the Impact of Web Robot Traffic on Web Systems*
National Science Foundation, \$174,319, 2015 – 2017
- PI: *Towards Geospatial Awareness from Wide-Area Aerial Surveillance*
NSF I/UCRC Center for Surveillance Research, \$45,373, 2015 – 2016
- Co-PI: *Assessing the Reliability of Medical Information on Online Social Media*
with D. Asamoah (PI), S. Schiller
WSU Research Initiation Grant, \$24,426, 2015 – 2016
(Doran's share: \$12,213)
- PI: *Understanding User Interactions in Large-Scale Online Emotional Support Systems*
7 Cups of Tea, Inc., \$4,500, 2015
- PI: *A Flexible Analytic Framework for Aviation Security Screening Checkpoint Performance*
Transportation Research Board of the National Academy of Sciences, \$10,000, 2012 – 2013
- PI: *EAPSI: Protecting Web Servers by Web Robot Detection*
National Science Foundation, \$5,617, 2010 – 2011

Support Grants and Doctoral Fellowships

- *Travel Grant*, Schloss Dagstuhl Seminar on Human-Like Neural-Symbolic Computing, \$1,500, 2017
- *Travel Grant* (for PhD student Ning Xie), 12th Reasoning Summer School, \$2,640, 2016
- *Pre-doctoral Fellowship*, Univ. of Connecticut Dept. of Computer Science & Engineering, \$2,050, 2013
- *Doctoral Dissertation Fellowship*, Univ. of Connecticut Graduate School, \$2,000, 2013
- *Travel Grant*, ACM Conference on Online Social Networks, \$1,500, 2013
- *Travel Grant*, IEEE Intl. Conference on Quantitative Evaluation of Systems \$450, 2010

PUBLICATIONS

Doran's undergraduate, MS and PhD advisees, and mentored visitors are underlined.

** denotes interdisciplinary work co-authored with colleagues outside of a computer science department or field.*

Books

- B1. D. Doran. *Network Role Mining an Analysis*. Springer, 2017, DOI 10.1007/978-3-319-53886-0

Refereed Journal Publications

Latest verifiable 1- or 5-year impact factor, or impact factor at time of submission, may be listed.

- p1. N. Xie, A. Kadav, F. Lai, and D. Doran. "A Survey and Discussion on Interpreting, Understanding, and Explaining Deep Neural Networks. (in preparation)
- p2. M. Piekenbrock, D. Doran, and R. Kramer. "Efficient Multi-Scale Simplicial Complex Generation for Mapper". SIAM Journal on Applied Algebra and Geometry (in preparation)
- J1. D. Asamoah, D. Doran, S. Schiller. "Interdisciplinarity in Data Science Pedagogy: A Foundational Design", Journal of Computer Information Systems, Taylor & Francis, 2018, DOI: 10.1080/08874417.2018.1496803
- J2. M. Hashler, M. Piekenbrock, and D. Doran. "dbscan: Fast Density-based Clustering Algorithms in R", Journal of Statistical Software, 2018 (accepted for publication)
- J3. K. Brown and D. Doran. "Contrasting Web Robot and Human Behaviors with Network Models", Journal of Communications, ETPub, Vol. 13, No. 8, pp. 473-481, 2018
- J4. M. Zabihimayvan, R. Sadeghi, N. Rude, and D. Doran. "A Soft Computing Approach for Benign and Malicious Web Robot Detection", Expert Systems with Applications, Elsevier, Vol. 87, pp. 129-140, 2017 (Impact factor: 2.98)
- J5. *N. Trivedi, D. Asamoah, and D. Doran. "Keep the Conversation Going: Engagement-Based Customer Segmentation for Online Social Service Platforms", Information Systems Frontiers, Springer, pp. 1-19, 2016. doi:10.1007/s10796-016-9719-x (Impact factor: 2.25)
- J6. *D. Asamoah, R. Sharda, N. Rude, and D. Doran. "RFID-Based Information Visibility for Hospital Operations: Exploring its Positive Effects using Discrete Event Simulation", Healthcare Management Science, Springer, pp. 1-12, 2016. doi:10.1007/s10729-016-9386-y (Impact factor: 1.84)
- J7. D. Doran and S. Gokhale. "An Integrated Method for Real-Time and Offline Web Robot Detection", Expert Systems, Wiley, 2016. doi:10.1111/exsy.12184 (Impact factor: 1.18)
- J8. D. Doran and A. Fox. "Operationalizing Central Place and Central Flow Theory with Mobile Phone Data", Annals of Data Science, Springer, Vol. 3, No. 1, pp. 1-24, 2016
- J9. D. Doran, K. Severin, S. Gokhale, and A. Dagnino. "Social Media Enabled Human Sensing for Smart Cities", AI Communications, IOS Press, Vol. 29, pp. 57-76, 2016
- J10. D. Doran. "On the Discovery of Social Roles in Large Scale Social Systems", Social Network Analysis and Mining, Springer, Springer, Vol. 5, No. 49, 2015

- J11. D. Doran, S. Gokhale, and A. Dagnino. "Discovering Perceptions in Online Social Media: A Probabilistic Approach", International Journal of Software Engineering and Knowledge Engineering, World Scientific Publishing, Vol. 24, No. 9, pp. 1-27, 2014
- J12. *D. Doran, S. Gokhale, and N. Lownes. "Analytic Model of Screening Times at Airport Security Checkpoints", Transportation Research Record: Journal of the Transportation Research Board, Vol. 2400, No. 1, pp. 1-8, 2014
- J13. D. Doran, A. De la Rosa Algarin, and S. Gokhale. "Characterizing the Activity of Friendship Triads on Facebook", Journal of Advances in Computer Networks, Vol. 2, No. 1, pp. 35-39, 2014
- J14. C. Phadke, V. Mendiratta, H. Uzunalioglu, D. Kushnir, and D. Doran. "Prediction of Subscriber Churn Using Social Network Analysis", Bell Laboratories Technical Journal, Vol. 17, No. 4, pp. 63-75, 2013
- J15. D. Doran and S. Gokhale. "A Classification Framework for Web Robots", Journal of the American Society for Information Science and Technology, Wiley, vol.64, pp. 2549-2554, 2012 (Impact factor: 2.16)
- J16. L. Lipsky, D. Doran, and S. Gokhale. "Checkpointing for the RESTART Problem in Markov Networks", Journal of Applied Probability, vol. 48A, pp. 195-207, 2011
- J17. D. Doran and S. Gokhale. "Web Robot Detection Techniques: Overview and Limitations", Data Mining and Knowledge Discovery, Springer, vol. 22, pp. 183-210, 2011 (Impact factor: 2.64)

Book Chapters

- BC1. D. Doran. "Data Scientist", Encyclopedia of Big Data, Springer, L. Schintler, C. McNeely (Eds.), 2018
- BC2. D. Doran. "Graph and Link Mining", Encyclopedia of Big Data, Springer, L. Schintler, C. McNeely (Eds.), 2017
- BC3. D. Doran and V. Mendiratta. "Modeling Propagation Phenomena for Mobile Phone Data Analytics", Propagation Phenomena in Real World Networks, Springer, D. Krol, D. Fay, and B. Gabrys (Eds.), pp. 335-376, 2015

Refereed Conference Publications

Verifiable main track acceptance rate may be listed.

- p2. N. Xie, M. Piekenbrock, and D. Doran. "An Intrinsic Certainty Score for Deep Neural Network Decisions", 2019 (in preparation)
- p3. N. Xie, A. Kadav, F. Lai, and D. Doran. "Visual Entailment: A Novel Task for Fine-Grained Image Understanding", Proc. of Computer Vision and Pattern Recognition, 2019 (in review)
- p4. J. Robinson and D. Doran. "A Seasonal Stochastic Block Model", Proc. of SIAM Intl. Conference on Data Mining, 2019 (In review)
- p5. M. Zabihimayvan, R. Sadeghi, D. Doran, and M. Allahyari. "A Broad Evaluation of the Tor English Content Ecosystem", Proc. of The Web Conference (WWW), 2019 (In review)

- p6. M. Ebrahimi, M. Sarker, F. Bianchi, N. Xie, D. Doran, and P. Hitzler. "Neuro-Symbolic Deductive Reasoning for Multi-Knowledge Graph Entailment", Proc. of The Web Conference (WWW), 2019 (In Review)
- C1. K. Brown, D. Doran, R. Kramer, and B. Reynolds. "HELOC Applicant Risk Performance Evaluation by Topological Hierarchical Decomposition", NIPS Workshop on Challenges and Opportunities for AI in Financial Services, 2018
- C2. N. Xie, A. Kadav, F. Lai, and D. Doran. "Visual Entailment Task for Visually-Grounded Language Learning", NIPS Workshop on Visually-Grounded Interaction and Language, 2018
- C3. S. Bhatt, S. Padhee, K. Chen, V. Shalin, D. Doran, A. Sheth, and B. Minnery. "Knowledge Graph Enhanced Community Detection and Characterization", Proc. of ACM. Intl. Conference on Web Search and Data Mining, Melbourne, Australia, Feb. 2019
- C4. G. Nebbione, D. Doran, S. Nadella, and B. Minnery. "Deep Neural Ranking for Crowdsourced Geopolitical Event Forecasting", Intl. Conference on Machine Learning for Networking, Paris, France, Nov. 2018
- C5. N. Vljajic, M.E. Masri, G. Riva, D. Doran, and M. Barry. "Online Tracking of Kids and Teens by Means of Invisible Images: COOPA vs. GDPR", Proc. of ACM Intl. Workshop on Multimedia Privacy and Security, Toronto, Canada, Oct. 2018
- C6. Y. Li, D.W. Kim, J. Zhang, and D. Doran. "TeaFilter: Detecting Suspicious Members in an Online Emotional Support Service", EAI Intl. Conference on Security and Privacy in Communication Networks, Singapore, Aug. 2018
- C7. M. Zabihimayvan and D. Doran. "Some (Non-)Universal Properties of Web Robot Traffic", IEEE Conference on Information Sciences and Systems, Princeton, NJ, March 2018
- C8. N. Xie, M. K. Sarker, D. Doran, P. Hitzler, and M. Raymer. "Relating Input Concepts to Convolutional Neural Network Decisions", NIPS Workshop on Interpreting, Explaining, and Visualizing Deep Learning, Long Beach, CA, Dec. 2017
- C9. K. Brown and D. Doran. "Realistic Traffic Generation for Web Robots", Proc. of IEEE Intl. Conference on Machine Learning and Applications, Dec. 2017
- C10. D. Doran, S. Schulz, and T. Besold. "What Does Explainable AI Really Mean? A New Conceptualization of Perspectives", Proc. Of Intl. Workshop on Comprehensibility and Explainability in Artificial Intelligence and Machine Learning, Bari, Italy, Nov. 2017
- C11. J. Robinson and D. Doran. "Seasonality in Dynamic Stochastic Blockmodels", Proc. Of IEEE/WIC/ACM Intl. Conference on Web Intelligence, pp. 976-979, Leipzig, Germany, Aug. 2017
- C12. S. Wijeratne, L. Balasuriya, A. Sheth, and D. Doran. "A Semantics-Based Measure of Emoji Similarity", Proc. Of IEEE/WIC/ACM Intl. Conference on Web Intelligence, pp. 646-653, Leipzig, Germany, Aug. 2017

- C13. M. K. Sarker, N. Xie, D. Doran, M. Raymer, and P. Hitzler. "Explaining Trained Neural Networks with Semantic Web Technologies: First Steps", Proc. Of 12th Intl. Workshop on Neural-Symbolic Learning and Reasoning, London, United Kingdom, Jul. 2017
- C14. N. Xie, K. Brown, N. Rude, and D. Doran. "A Soft Computing Prefetcher to Mitigate Cache Degradation by Web Robots", Proc. Of Intl. Symposium on Neural Networks, pp. 536-546, Sapporo, Japan, Jun. 2017
- C15. S. Wijeratne, L. Balasuriya, A. Sheth, and D. Doran. "EmojiNet: An Open Service and API for Emoji Sense Discovery", Proc. Of AAAI Intl. Conference on Weblogs and Social Media, pp. 437-446, Montreal, CA, May 2017 (Accept Rate: 30%)
- C16. S. Wijeratne, L. Balasuriya, A. Sheth, and D. Doran. "EmojiNet: Building a Machine Readable Sense Inventory for Emoji", Proc. Of International Conference on Social Informatics, pp. 527-541, Seattle, WA, Nov. 2016 (Accept Rate: 29%)
- C17. L. Balasuriya, S. Wijeratne, D. Doran, and A. Sheth. "Finding Street Gang Members on Twitter", Proc. of IEEE/ACM Intl. Conference on Advances in Social Network Analysis and Mining, pp. 685-692, San Francisco, CA, Aug. 2016 (Accept Rate: 13%)
- C18. S. Wijeratne, L. Balasuriya, D. Doran, and A. Sheth. "Word Embeddings to Enhance Twitter Gang Member Profile Identification", 3rd Workshop on Semantic Machine Learning at Intl. Joint Conference on Artificial Intelligence, pp. 18-24, New York, NY, Jul. 2016
- C19. *M.C. Calzarossa, L. Massari, D. Doran, S. Yelne, N. Trivedi, and G. Moriarty. "Measuring the Users and Conversations of a Vibrant Online Emotional Support System", Proc. Of IEEE Symposium on Computers and Communications, pp. 1193-1199, Messina, Italy, Jul. 2016
- C20. *D. Asamoah, D. Doran, and S. Schiller. "Teaching the Foundations of Data Science: An Interdisciplinary Approach", SIGDSA Pre-ICIS Business Analytics Congress, Fort Worth, TX, Dec. 2015 (Best Teaching Paper, Runner-up Award)
- C21. M. Maurice, M. Piekenbrock, and D. Doran. "WAMINet: An Open Source Library for Dynamic Geospace Analysis Using WAMI", Proc. Of IEEE Intl. Conf. on Image and Multimedia Processing, pp. 445-448, Miami, FL, Dec. 2015
- C22. N. Rude and D. Doran. "Request Type Prediction for Web Robot and Internet of Things Traffic", Proc. Of IEEE Intl. Conference on Machine Learning and Applications, pp.988-993, Miami, FL, Dec. 2015 (Accept Rate: 30%)
- C23. *D. Doran, S. Yelne, L. Massari, M.C. Calzarossa, L. Jackson, and G. Moriarty. "Stay Awhile and Listen: User Interactions in a Crowdsourced System Offering Emotional Support", Proc. of IEEE/ACM Intl. Conference on Advances in Social Network Analysis and Mining, pp. 667-674, Paris, France, Aug. 2015 (Accept Rate: 18%) (Best Paper Award, Industry Track)
- C24. S. Kumar, P. Kapanipathi, D. Doran, P. Jain, and A. Sheth. "Entity Recommendations Using Hierarchical Knowledge Bases", Proc. Of Intl. Workshop on Knowledge Discovery and Data Mining Meets Linked Open Data at European Semantic Web Conference, Portoroz, Slovenia, Jun. 2015

- C25. *S. Wijeratne, D. Doran, A. Sheth, and J. Dustin. "Analyzing the Social Media Footprint of Street Gangs", Proc. Of IEEE Intl. Conference on Intelligence Security Informatics, pp. 91-96, Baltimore, MD, May 2015
- C26. D. Doran, A. Fox, and V. Mendiratta. "Where do we Develop? Discovering Regions for Urban Investment in Senegal", Intl. Conf. on the Analysis of Mobile Phone Datasets Data for Development Challenge Book of Abstracts: Scientific Papers, pp. 530-540, Cambridge, MA, Apr. 2015
(Challenge Rank: top 20% of 150+ submissions)
- C27. H. Alzhami, S. Gokhale, and D. Doran. "Understanding Social Effects in Online Networks", Proc. Of IEEE Intl. Symposium on Social Computing and Semantic Data Mining, pp. 863-868, Ana Feb. 2015 (Accept Rate: 24%)
- C28. D. Doran. "Triad-based Role Discovery for Large Social Systems", Proc. Of Intl. Conference on Social Informatics Workshops, Lect. Notes in Computer Science 8852, pp. 130-143, Barcelona, Spain, Nov. 2014
- C29. L. Lin, A. Dagnino, D. Doran, and S. Gokhale. "Data Analytics for Power Utility Storm Planning", Proc. Of Intl. Conference on Knowledge Discovery and Information Retrieval, SCITEPRESS Digital Proceedings, Rome, Italy, Oct. 2014
- C30. D. Doran, S. Gokhale, and A. Dagnino. "Accurate Local Estimation of Geo-Coordinates for Social Media Posts", Proc. Of Intl. Conference on Software Engineering and Knowledge Engineering, pp. 642 – 647, Vancouver, CA, July 2014 (Accept Rate: 30%)
- C31. D. Doran. "An Analytic Model of Airport Security Checkpoint Screening Times", Proc. of The 2014 Annual Meeting Compendium of Papers (Online and DVD format), Washington, D.C., Jan. 2014
- C32. *D. Doran, S. Gokhale, and K. Konduri. "Participatory Paradigms: Promises and Challenges for Urban Transportation", Proc. of The 2014 Annual Meeting Compendium of Papers (Online and DVD format), Washington, D.C., Jan. 2014
- C33. D. Doran, S. Gokhale, and A. Dagnino. "Human Sensing for Smart Cities", Proc. of ACM/IEEE Intl. Conference on Advances in Social Network Analysis and Mining, pp. 1323-1329, Niagara Falls, Canada, Aug. 2013
- C34. D. Doran, K. Morillo, and S. Gokhale. "A Comparison of Web Robot and Human Requests", Proc. of ACM/IEEE Intl. Conference on Advances in Social Network Analysis and Mining, pp.1374-1380, Niagara Falls, Canada, Aug. 2013
- C35. D. Doran, H. Alzhami, and S. Gokhale. "Triads, Transitivity, and Social Effects in User Interactions on Facebook", Proc. of IEEE Intl. Conference on Computational Aspects of Social Networks, pp. 68-73, Fargo, ND, Aug. 2013
- C36. D. Doran, S. Gokhale, and A. Dagnino. "Understanding Common Perceptions in Online Social Media", Proc. of Intl. Conference on Software Engineering and Knowledge Engineering, pp. 107-112, Boston, MA, July 2013 (Accept Rate: 29%) (Best Paper Top 3 Award)

- C37. B. Lim, D. Doran, V. Mendiratta, M. Rodriguez, and D. Klabjan. "Social Capital for Economic Development: Application of Time Series Cluster Analysis on Personal Network Structures", Intl. Conf. on the Analysis of Mobile Phone Datasets: Mobile Phone Data for Development Book, pp. 97-104, Cambridge, MA, May 2013
- C38. M. Rodriguez, V. Mendiratta, B. Lim, D. Doran, and D. Klabjan. "Interactive Visualization of Cellphone Network Data Using D3: The Case of Ivory Coast", Intl. Conf. on the Analysis of Mobile Phone Datasets and Networks: Mobile Phone Data for Development Book, pp. 303-308, Cambridge, MA, May 2013
- C39. D. Doran and S. Gokhale. "Detecting Web Robots Using Resource Request Patterns", Proc. of IEEE Intl. Conference on Machine Learning and Applications, pp. 7-12, Boca Raton, FL, Dec. 2012
- C40. D. Doran, V. Mendiratta, C. Phadke, and H. Uzunalioglu. "The Importance of Outlier Relationships in Mobile Call Graphs", Proc. Of IEEE Intl. Conference on Machine Learning and Applications, pp. 24-29, Boca Raton, FL, Dec. 2012 ([Best Paper Award](#))
- C41. D. Doran and S. Gokhale. "Long Range Dependence (LRD) in the Arrival Process of Web Robots", Proc. Of Intl. Conference on Intelligent Network and Computing, pp. 176-180, New Delhi, India, Aug. 2012
- C42. D. Doran, S. Curley, and S. Gokhale. "How Social Network APIs Have Ended the Age of Privacy", Proc. Of Intl. Conference on Software Engineering and Knowledge Engineering, pp. 400-405, Redwood City, CA, July 2012 ([Accept Rate: 27%](#))
- C43. K. Severin, C. Spinner, M. Calvo, D. Doran, and L. Fiondella. "Reliability and Performance Assessment of an Aviation Security Screening Checkpoint", Proc. of Reliability and Quality in Design Conference, pp. 364-368, Boston, MA, July 2012
- C44. D. Doran, V. Mendiratta, C. Phadke, and H. Uzunalioglu. "Examining the Social Decomposition of Mobile Call Graphs", Conference on the Analysis of Mobile Phone Datasets and Networks, pp. 86-88, Cambridge, MA, Oct. 2011
- C45. D. Doran, M. Tran, L. Fiondella, and S. Gokhale. "Architecture-based Reliability Analysis with Uncertain Parameters", Proc. of Intl. Conference on Software Engineering and Knowledge Engineering, pp. 629-634, Miami, FL, July 2011 ([Accept Rate: 31%](#))
- C46. D. Doran and S. Gokhale. "Searching for Heavy-Tails in Web Robot Traffic", Proc. of IEEE Intl. Conference on Quantitative Evaluation of Systems, pp. 282-291, Williamsburg, VA, Sept. 2010
- C47. D. Doran, L. Lipsky, and S. Thompson. "Cost-based Optimization of Buffer Size in M/G/1/N Systems Under Different Service-time Distributions", Proc. of IEEE Intl. Symposium on Network Computing and Applications, pp. 28-35, Cambridge, MA, July 2010 ([Accept Rate: 27%](#)) ([Best Student Paper Nominee](#))
- C48. D. Doran and S. Gokhale. "Classifying Web Robot Traffic by K-Means Clustering", Proc. of Intl. Conference on Software Engineering and Knowledge Engineering, pp. 97-102, Boston, MA, July 2009
- C49. D. Doran and S. Gokhale. "Discovering New Trends in Web Robot Traffic through Functional Classification", Proc. of IEEE Intl. Symposium on Network Computing and Applications, pp. 275-278, Cambridge, MA, July 2008

Refereed Posters

- P1. D. Doran, A. De la Rosa Algarin, and S. Gokhale. "Understanding User Triads on Facebook", Workshop on Information and Decision in Social Networks, Cambridge, MA, Nov. 2012
- P2. D. Doran, V. Mendiratta, C. Phadke, D. Kushnir, and H. Uzunalioglu. "Using Social Influence to Predict Subscriber Churn", Workshop on Information and Decision in Social Networks, Cambridge, MA, Nov. 2012
- P3. V. Mendiratta, D. Doran, C. Phadke, and H. Uzunalioglu. "Applying SNA Techniques to Telecom Subscriber Calling Data", INFORMS Conf. on Business Analytics & Op. Research, Huntington Beach, CA, Apr. 2012

Refereed Abstracts

- A1. N. Xie and D. Doran. "A Manifold Perspective for Debugging and Interpreting Deep Neural Networks", European Conference on Data Analysis, Paderborn, Germany, Jul. 2018
- A2. L. Balasuriya, S. Wijeratne, D. Doran, and A. Sheth. "Signals Revealing Street Gang Members on Twitter", 2016 ChASM workshop on Computational Approaches to Social Modeling, Seattle, WA, Nov. 2016
- A3. M. Piekenbrock and D. Doran. "Exploring Information-Optimal Network Discretization for Dynamic Network Analysis", XXXVI SUNBELT Conference Book of Abstracts, pg. 262, Newport Beach, CA, Apr. 2016
- A4. *D. Doran, N. Lownes, and S. Gokhale. "Flexible, Analytic Modeling of Airport Security Checkpoints", INFORMS Annual Meeting, Minneapolis, MN, Oct. 2013
- A5. *L. Fiondella, D. Doran, and M. Accorsi. Performance and Reliability Assessment of Aviation Security Screening Checkpoints. In Proc. of National Security Innovation Competition, Apr. 2012

PATENTS

- 1. D. Kushnir, A. Akyamac, V. Mendiratta, H. Uzunalioglu, D. Doran. "Root Cause Analysis for Service Degradation in Computer Networks, U.S. Patent #9424121, Granted 2016
- 2. V. Mendiratta, D. Doran, C. Phadke, H. Uzunalioglu, D. Kushnir. "Method and Apparatus for Deriving Composite Tie Metric For Edge Between Nodes of Telecommunication Call Graph", U.S. Patent #9159077, Granted 2015
- 3. C. Phadke, H. Uzunalioglu, V. Mendiratta, D. Kushnir, D. Doran. "System and Method for Generating Subscriber Churn Predictions", U.S. Patent #8804929, Granted 2015

STUDENT MENTORING AND ADVISEMENT

Current Graduate Student Advisees

Ning Xie (PhD)

Mahdieh Zabihimayvan (PhD)

Kyle Brown (PhD)

Jameson Morgan (MS)

Walter Waldow (MS)

Completed MS Students

- 1. Jace Robinson, MS, 2018 (Dept. of Defense SMART Fellow, 2018)
Seasonality in Dynamic Stochastic Blockmodels
- 2. Matthew Piekenbrock, MS, 2018 (WSU Top MSCS Graduate Student Awardee, 2018)
Intrinsic Point of Interest Discovery from Trajectory Data

3. Lakshika Balasuriya, MS, 2018
Finding Street Gang Member Profiles on Twitter
4. Nathan Rude, MS, 2016
Intelligent Caching to Mitigate the Impact of Web Robots on Web Server Performance
5. Samir Yelne, MS, 2016
Measures of User Interactions, Conversations, and Attacks in a Crowdsourced Emotional Support System

Undergraduate Research and Independent Study Advisees

2018: Logan Rickert, Alex Groeger, Jameson Morgan

2017: Logan Rickert, Scott Duberstein, Ethan Wolfer, Luke Burnett, Jameson Morgan, Brandon Hawes, Benjamin Schott

2016: Logan Rickert, Scott Duberstein, Ethan Wolfer

2015: Logan Rickert, Matthew Piekenbrock, Nripesh Trivedi, Scott Duberstein

Ph.D. Committee Memberships

1. Sanjaya Wijerante, Wright State University, 2018 (**WSU Top PhD CS Graduate Student Awardee, 2018**)
Framework to Understand Emoji Meaning: Similarity, Sense Disambiguation, and Prediction of Emoji using EmojiNet
2. Sarasi Lalithsena, Wright State University, 2018
Domain-specific Knowledge Extraction from Web of Data
3. Raghava Mutharaju, Wright State University, 2016
Distributed Rule-Based Ontology Reasoning
4. Pavan Kampanipathi, Wright State University, 2016
Personalized and Adaptive Semantic Information Filtering for Social Media

M.S. Committee Memberships:

1. Sanjeev Bhatta, Wright State University, 2017
Conditional Correlation Analysis
2. Siva Kumar, Wright State University, 2017
Specificity in Taxonomic Entity Recommendation
3. Reihaneh Amini, Wright State University, 2016
Crowdsourcing Ontology Alignment Benchmarks
4. Kurtis Glendenning, Wright State University, 2015
Browser Based Visualization of Parameter Spaces for Big Data Using Client-Server Model
5. Jacob Ross, Wright State University, 2015
Features for Ranking Tweets Based on Credibility and Newsworthiness
6. Revathy Krishnamurthy, Wright State University, 2014
Geo-locating Social Media Users Using Wikipedia

TEACHING EXPERIENCE

Wright State University, Dayton, OH

Faculty, Department of Computer Science & Engineering

- CS 2200 – Discrete Structures and Their Algorithms, Sp. 17, Fa. 17, Sp. 18, Fa. 18
- CS 7210 - Network Science, Sp. 15, Sp. 16, Sp. 17, Sp. 18
- CEG 4110/6110 - Introduction to Software Engineering, Fa. 14, Fa. 15, Fa. 16, Fa. 17, Fa. 18
- CS 3250/5250 – Computational Methods for Data Analysis, Sm. 15, Sp. 16, Fa. 16

Eastern Connecticut State University, Willimantic, CT

Adjunct Faculty, Department of Computer Science

- CSC 338 - LANs/MANs/Internetworks, Fa. 11

University of Connecticut, Storrs, CT**Teaching Assistant, Department of Computer Science & Engineering**

- CSE 5099 - Computational Issues in Social Network Analysis, Fa. 12
- CSE 2012 - Introduction to Software Engineering, Fa. 07, Sp. 08, Fa. 08, Sp. 09, Sp. 14
- CSE 4701 - Principles of Databases, Fa. 07
- CSE 3504 - Probabilistic Analysis of Computer Systems, Sp. 10, Sp. 11
- CSE 4099 - Undergraduate Independent Study, Fa. 09, Sp. 10, Sp. 11, Fa. 12

SERVICE

Research Community Service

- National Science Foundation Panel Reviewer, 2018, 17
- Netherlands Organization for Scientific Research Proposal Reviewer, 2018
- Editorial Board Memberships:
 - Social Network Analysis and Mining
 - International Journal on Web Engineering and Technology
 - Semantic Web Journal Special Issues:
 - Knowledge Graphs: Construction, Management, and Querying
 - Semantic Deep Learning
- Conference Leadership:
 - Review Process Improvement Chair, European Semantic Web Conference, 2017
 - Session Chair, ACM/IEEE Intl. Conference on Web Intelligence, 2017
- Technical Program Committee Membership:
 - Cognition and Ontologies and CEX: Explainable AI Workshop @ FOIS, 2018
 - ACM/IEEE Intl Conf. On Advances in Social Network Analysis & Mining, 2018, 17
 - Intl. Joint Conference on Artificial Intelligence 2018, 16
 - Intl. World Wide Web Conference (now called The Web Conference), 2018
 - Intl. Workshop on Neural-Symbolic Learning and Reasoning, 2018
 - Intl. Conference on Information Systems and Data Mining, 2018
 - Hybrid Statistical Semantic Understanding and Emerging Semantics Workshop, 2017
 - Workshop on Comprehensibility and Explainability in AI and ML, 2017
 - Intl. Semantic Web Conference, 2017
 - Emerging Semantics Workshop at ISWC, 2017
 - IEEE Intl. Conference on Systems, Man, and Cybernetics, 2017
 - Intl. Conference on Software Engineering and Knowledge Engineering, 2017,16,15
 - Intl. Conference on Information Science and Applications, 2017
 - IEEE Intl. Conference on IT Convergence and Security, 2016, 15
 - AAAI Conference on Artificial Intelligence, 2015
 - Diversity++ Workshop at International Semantic Web Conference, 2015
 - IEEE Intl. Conference on Computer Vision & Image Analysis, 2015
 - Intl. Conference on Information Science and Security, 2015
 - Intl. Symposium on Computer Vision and the Internet, 2015
 - IEEE Intl. Conference on Technologies for Homeland Security, 2015
 - Global Summit on Computer & Information Technology, 2014

- Journal Referee:
 - Networks and Spatial Economics
 - IEEE Transactions on Cognitive and Developmental Systems
 - Expert Systems with Applications
 - Informatics
 - Journal of Artificial Intelligence Research
 - Social Network Analysis and Mining
 - Data Mining and Knowledge Discovery
 - Information Systems Frontiers
 - Journal of the American Society for Information Science and Technology
 - Computers & Security
 - Computer Networks
 - Applied Sciences
 - Entropy
 - Sensors
 - Software X
 - International Journal on Web Engineering and Technology
 - EURASIP Journal on Information Security
- Conference Referee (As non-TPC Member):
 - (ECML/PKDD) European Conf. on ML and Principles and Practice of Knowledge Discovery, 2015
 - NSF Conference on Big Data and Urban Informatics
 - (NetMob) Intl. Conference on the Scientific Analysis of Mobile Phone Datasets, 2015
 - (CAMAD) Intl. Workshop on Modeling, Analysis, and Design of Comm. Links and Networks, 2012
 - (SEKE) Intl. Conference on Software Engineering and Knowledge Engineering, 2010

Professional Service

- Advisory Board Member, Teradata University Network, 2016, 15
- Committee Member, TRB Aviation Security and Emergency Management, 2016, 15, 14, 13
- Committee Member, Young Members Council of the TRB, 2016, 15, 14, 13
- Working Group Member, IEEE Recommended Practice on Software Reliability, 2014, 13

University Service

- at Wright State University:
 - Chair, Steering Committee, Dept. of CSE, 2018 – 2019
 - Athletics Council, 2018 – 2020
 - Undergraduate Academic Policies Committee, 2018 – 2019
 - Speaker, Direct Admit Welcome Event, Dept. of CSE, 2018
 - Ad-Hoc University Research Committee, 2017
 - Graduate Studies Committee, Dept. of CSE, 2018, 17, 16, 15
 - Dean's Faculty Fellows Program, College of Eng. and Computer Science, 2017, 16
 - Chair, Department Seminar Committee, Dept. of CSE, 2016, 15
 - Guest Lecturer, Summer Alumni College Event, 2015
 - Speaker, Direct Admit Welcome Event, Dept. of CSE, 2015
 - Chair, Research & Scholarly Environment Committee, Dept. of CSE, 2015, 14
 - Undergraduate Studies Committee, Dept. of CSE, 2015, 14

- at University of Connecticut:
 - Graduate Student Senate
 - Officer and Executive Committee Member, 2012, 11, 10
 - Activities Director; Activities Committee Chair, 2012, 11, 10
 - At-Large Senator, 2014, 13, 12
 - Finance Committee, 2014, 13, 12
 - Public Relations Committee, 2011, 10
 - Parking Appeals Committee, 2012
 - Graduate Faculty Council, 2011
 - Student Technology Advisory Group, 2013, 12, 11, 10

INVITED TALKS AND POSTERS (EXCLUDING REQUIRED TALKS FOR CONFERENCE PUBLICATIONS)

1. "Okay but Really... What is Explainable AI?", NIST Ontology Summit 2019, 2018
2. "Understanding What Machines Learn", WSU Dept of CSE. Direct Admit Program, Dayton, OH, 2018
3. "GAN-Based Topological Extensions", Air Force Research Laboratories, WBAFB, OH, 2017
4. "From Interpretable to Explainable Deep Nets", IBM TJ Watson Research Center, Yorktown NY, 2017
5. "Explainable(?) Statistical ML", Dagstuhl Seminar on Human-like Neural Symbolic Computing, Wadern, Germany, 2017
6. "A Deep Learning System for Web Robot Traffic Generation", 2016 Women in STEMM Leadership Institute Symposium, Dayton, OH, 2016
7. "EmojiNet: A Machine Readable Sense Inventory for Emoji", 2016 Wright Brothers Day, Wright State University, Dayton, OH, 2016
8. "A Unified Model for Knowledge Discovery from Geospatial Data", AFRL Big Data Surveillance Analytics Mini-Conference, Air Force Research Laboratories, WBAFB, OH, July 2016
9. "A Unified Model for Knowledge Discovery from Geospatial Data", AFRL Big Data Surveillance Analytics Mini-Conference, Wright State University, Dayton, OH, July 2016
10. "WAMI.Net: A Software Library for Geospatial Analysis", 2016 Southwestern Ohio Council for Research Education Graduate STEM Research Fair.
11. "Mitigating the Impact of Web Robot Traffic on Web Systems", 2016 Southwestern Ohio Council for Research Education Graduate STEM Research Fair.
12. "Web and Complex Systems Analysis @ Wright State University", WSU Faculty Speaker Series, Wright State Research Institute, Dayton, OH, October 2015
13. "What you can learn from YOUR Facebook Data", Summer Alumni School Lecture, Wright State University, Dayton, OH, August 2015
14. "What you can learn from YOUR Facebook Data", Dept. of CSE Open House, Wright State University, Dayton, OH, April 2015
15. "Protecting Web Servers From Web Robot Traffic", School of Electrical and Electronics Engineering and Computer Science Seminar, University of Pavia, Italy, November 2014
16. "Aviation 101: How to Get Involved and Make a Difference", Roundtable Participant (AV090 Committee Representative), The Transportation Research Board 93rd Annual Meeting, Washington, D.C., January 2014
17. "Mining Perceptions and Positions in Social Media", Robotics Seminar, ABB Corporate Research, Windsor, CT, November 2013
18. "Perceptions and Positions in Social Media", Computer Science and Information Systems Seminar, University of Massachusetts Dartmouth, Dartmouth, MA, November 2013
19. "Perceptions and Positions: Human Sensing via Social Media", Industrial Software Systems Seminar, ABB Corporate Research, Raleigh, NC, May 2013
20. "Complex Network Diagnosis: Ignoring Architecture to Identify Root Causes", Network Performance & Reliability Seminar, Bell Laboratories, Murray Hill, NJ, August 2012

21. "Activity Among Triads in Facebook", School of Engineering Student Tech Forum, University of Connecticut, Storrs, CT, May 2012
22. "Social Ties and Predicting Churn in Mobile Call Graphs", Network Performance & Reliability Seminar, Bell Laboratories, Murray Hill, NJ, August 2011
23. "Social Ties and Predicting Churn in Mobile Call Graphs", Mathematics and Operations Research Seminar, Bell Laboratories, Murray Hill, NJ, August 2011

PROFESSIONAL AFFILIATIONS

Upsilon Pi Epsilon	IEEE	IEEE Communications Society
ACM	ACM SIGWEB	SIAM
TRB (Young Member)		

PROFESSIONAL DEVELOPMENT

Graduate Student Professional Development Certificate

School of Engineering, University of Connecticut

A certificate awarded for completing a series of professional development seminars for graduate students. Topics included proposal writing, ethical issues, lecture preparation, networking, and presentation skills.

OTHER

U.S. Citizen