Curriculum Vitae

Wan D. Bae

Seattle University
CINE 290-01, 901 12th Avenue
Seattle, WA 98122

Office: (206) 296-5573
Email: baew@seattleu.edu

Education

Ph.D. Computer Science, University of Denver	November 2007

> Dissertation: Online Query Processing in Geographic Information Systems
> Advisor: Professor Scott T. Leutenegger

M.S. Computer Science, University of Denver	June 2004
B.S. Architectural Engineering, Yonsei University, South Korea	February 1989

Professional Experience

Position	Organization	Dates
Professor	Department of Computer Science, Seattle University	09/2022 - present
Thomas J. Bannan Endowed Chair of Engineering	College of Science and Engineering, Seattle University	07/2023 - 06/2025
Associate Professor	Department of Computer Science, Seattle University	08/2019 - 08/2022
Associate Professor	Dept of Computer Science, The Evergreen State College	09/2018 - 07/2019
Tenured Associate Professor	Dept of Mathematics, Statistics and Computer Science, University of Wisconsin - Stout	09/2014 - 08/2018
Visiting Associate Professor	Dept of Computer Science, Hanyang University, South Korea	02/2016 - 08/2017
Associate Professor	Dept of Mathematics, Statistics and Computer Science, University of Wisconsin - Stout	09/2012 - 08/2014
Assistant Professor	Dept of Mathematics, Statistics and Computer Science, University of Wisconsin - Stout	08/2008 - 08/2012
Software Consultant	Jeppesen, A Boeing Company	05/2007 - 08/2008
Teaching Assistant	Dept of Computer Science, University of Denver	01/2005 - 12/2007
Software Engineer	Mega Data Systems, Denver	06/2004 - 05/2005
Architect, Senior Manager	Samoo Architects & Engineers, South Korea	09/1992 - 06/2001
Junior Architect	Junglim Architecture, South Korea	01/1989 - 08/1992

Membership in Professional Organizations

- Association for Computing Machinery (ACM) (since 2007)

- ACM Special Interest Groups: ACM SIGSPATIAL (since 2007), ACM SIGCSE (since 2010)

- IEEE Computer Society (since 2007)

- Korean Computer Scientists and Engineers Association of America (KOCSEA) (since 2012)

- Korea Institute of Registered Architects (KIRA) (1994 - 2004)

- Architectural Institute of Korea (AIK) (1989 - 2004)

Research Interests

Spatial and spatio-temporal databases, Spatio-temporal data mining, Data science and machine learning in health informatics, Mobile computing and optimization, Statistical data modeling and analysis, Geographic Information Systems (GIS), Applied computational geometry.

Research Stays

Long-term research stays (more than 1 month)

- United Arab Emirates University, UAE, collaboration with Shayma Alkobaisi (12/2013 - 01/2014, 08/2015 - 2/2016)

- Yonsei University, South Korea, collaboration with Sanghoon Lee (05/2015 - 07/2015)

Short-term research stays

- Sooncheonhyang University, South Korea, collaboration with Sungrul Kim (2019, 2022, 2023)

- Yonsei University, Southg Korea, collaboration with Cha Ho Chung (2014, 2015)

- United Arab Emirates University, collaboration with Shayma Alkobaisi (2010, 2011, 2012)

Teaching

All courses taught are listed with level (U = undergraduate course, G = graduate course) and term indicated.

Courses taught at Seattle University

Course	Level	Terms
Data-Driven Problem Solving and Programming	U	FA 2019, WIN 2020, FA 2020, SP 2021
Fundamentals of Databases	U	WIN 2020, SP 2021, WIN 2022
Machine Learning	U	SP 2020, SP 2022
Machine Learning	G	WIN 2021
Artificial Intelligence	U	WIN 2021, WIN 2023
Artificial Intelligence	G	FA 2021, SP 2023, FA 2023
Intro to Data Science	G	FA 2021, FA 2022, FA 2024
Data Management for Data Science	G	WIN 2025
Data Science Capstone Project	G	WIN 2023, WIN 2024

Courses taught at prior institutes

Introduction to Computing	U	2018	Evergreen State College
Computational Linguistics	U	2018	Evergreen State College
Computer Science Foundations I & II	U	2019	Evergreen State College
Databases	U	2019	Evergreen State College
Computer Science I	U	2009 - 2011, 2017	UW-Stout
Computer Science II	U	2012 - 2014, 2018	UW-Stout
Computer Programming for Multimedia I & II	U	2008, 2009	UW-Stout
Data Structures	U	2011 - 2015, 2017	UW-Stout
Web and Internet Programming	U	2011 - 2014, 2018	UW-Stout
Database Design and Development	U	2010 - 2015	UW-Stout
Systems Programming	U	2009 - 2014, 2018	UW-Stout
Computer Graphics	U	2009	UW-Stout
Elementary Statistics	U	2010 - 2015	UW-Stout
Probability and Statistics for Engineers	U	2016, 2017	Hanyang University, S. Korea
Data Structures	U	2017	Hanyang Unitersity, S. Korea
Database Systems	U	2016	Hanyang Unitersity, S. Korea
Data Mining	U	2016	Hanyang Unitersity, S. Korea
Data Science	U/G	2017	Hanyang Unitersity, S. Korea
Big Data Analytics for Image Processing	G	2015	Yonsei University, S. Korea
Operating Systems	U	2015	UAE University, UAE
Introduction to 2D Game Programming	U	2008	University of Denver
Object-Oriented Programming in Java	U	2008	Metropolitan State College

Courses developed

- Computer Science Foundations I and II (Evergreen State College)

- Computatoinal Linguistics (Evergreen State College)

- Web and Internet Programming (UW-Stout)

- Systems Programming (UW-Stout)

- Data Science (Hanyang University, S. Korea)

- Big Data Analytics for Image Processing (Yonsei University, S. Korea)

Publications

The asterisk mark (*) indicates student co-authors.

Refereed journal papers

1. Synthetic Data Generation and EvaluationTechniques for Classifiers in Data StarvedMedical Applications, W. D. Bae, S. Alkobaisi, Matthew Horak, Siddheshwari Bankar, Sartaj Bhuvaji, Sungroul Kim, CS. Park, *submitted and under review, Journal of IEEE ACCESS*, September 2024

2. A hybrid Approach for forecasting peak expiratory flow rate inasthma patients using linear regression, S. Alkobaisi, W. D. Bae, M. F. Safdar*, N. Ali, S. Kim, CS. Park, R. M. Nowak, *submitted and under review, Journal of PLOS ONE*, April 2024

3. Predicting Health Risks of Adult Asthmatics Susceptible to Indoor Air Quality Using Improved Logistic and Quantile Regression Models, W. D. Bae, S. Alkobaisi, M. Horak, S. Kim, CS. Park, and J. Davidson*, *Journal of Life*, 12(10), DOI: https://www.mdpi.com/2075-1729/12/10/1631, 2022

4. A Two-Step Machine Learning Approach for Crop Disease Detection Using GAN and UAV Technology, A Prasad*, N. Mehta*, M. Horak, and W. D. Bae, *Journal of Remote Sensing*, 14(19), DOI: https://doi.org/10.3390/rs14194765, 2022

5. Performance improvement of machine learning techniques predicting the association of exacerbation of peak expiratory flow ratio with short term exposure level to indoor air quality using adult asthmatics clustered data, W. D. Bae, S. Kim, CS. Park, S. Alkobaisi, J. Lee*, W. Seo*, JS. Park, S. Park, S. Lee, and J. W. Lee, *Journal of PLOS ONE*, 16(1), DOI: 10.1371/journal.pone.0244233, 2021

6. A Two-Step Machine Learning Approach for Crop Disease Detection Using GAN and UAV Technology, A Prasad*, N. Mehta*, M. Horak, and W. D. Bae *arXiv preprint*, DOI: https://doi.org/10.48550/arXiv.2109.11066, 2021

7. FORESEE: An effective and efficient framework for estimating the execution times of IO traces on the SSD, Y. Kang*, YY. Jo*, J. Choi, W. D. Bae , W. Lee and SW. Kim, *Journal of IEEE Transactions on Computers*, 70(12), DOI: 10.1109/TC.2020.3038189, 2020

8. Predictive and exposome analytics: A Case study of asthma exacerbation management, S. Alkobaisi, W. D. Bae, M. Horak, S. Narayanappa, J. Lee*, E. AbuKhousa, CS. Park and D. Bae, *Journal of Ambient Intelligence and Smart Environments* (JAISE), 11(6): 527-552, 2019

9. A real-time health monitoring system for evaluating environmental exposures, Wan D. Bae, S. Alkobaisi, S. Narayanappa and C. Liu, *Journal of Software*, Vol. 8 (4):791-801, 2013

10. Steel threads: Framework for developing software system architecture, S. Alkobaisi, W. D. Bae and S. Narayanappa, *Journal of Computational Methods in Science and Engineering (JCMSE)*, Vol. 12 (3): 63-77, 2012

11. An interactive framework for spatial joins: a statistical approach for data analysis in GIS, S. Alkobaisi, W. D. Bae, P. Vojtěchovský and S. Narayanappa, *Journal of GeoInformatica*, Vol. 16(2):329-355, 2012 (ISSN: 1384-6175)

12. Modeling uncertainty in moving objects databases, S. Alkobaisi, W. D. Bae and S. Narayanappa, IEICE (Institute of Electronics, Information and Communication Engineers) *Journal of Transactions on Information and Systems*, Vol E94-D:2440-2459, 2011 (ISSN: 0916-8532)

13. Graph-semantic based Web data model: Conceptual design to logical representation, A. Sanyal, A. Sarkar, S. Choudhury and W. D. Bae, *Journal of Computational Methods in Sciences and Engineering (JCMSE)*, Vol. 11 (S1):77-88, 2011

14. Optimizing map labeling of point-features based on an onion peeling approach, W. D. Bae, S. Alkobaisi, S. Narayanappa, P. Vojtěchovský and K. Y. Bae, *Journal of Spatial Information Science*, http://www.josis.org/index.php/josis/article/view/34, 2011

15. IRSJ: Incremental refining spatial joins for interactive queries in GIS, W. D. Bae, S. Alkobaisi and S. T. Leutenegger, *Journal of GeoInformatica*, Vol. 14(4):507-543, 2010 (ISSN: 1384-6175)

16. Web data retrieval: Solving spatial range queries using k-Nearest Neighbor searches, W. D. Bae, S. Alkobaisi, S. H. Kim, S. Narayanappa and C. Shahabi, *the Journal of GeoInformatica*, Vol. 13(4):483-514, 2009 (ISSN: 1384-6175)

Refereed conference papers

1. Incremental SMOTE with Control Coefficient for Classifiers in Data Starved Medical Applications, W. D. Bae, S. Bankar*, S. Bhuvaji*, J. Singhvi*, M. Irukulla*, and W. McDonnell*, *accepted and appear to the 26th International Conference on Big Data Analytics and Knowledge Discovery (DAWAK 2024), pp. 112-119*, Lecture Notes in Computer Science, vol 14912. Springer, 2024

2. SDGnE: A Synthetic Data Generation and Evaluation System for Rare Event Prediction, W. D. Bae, S. Alkobaisi, S. Bhuvaji*, S. Bankar*, *accepted and appear to the 29th International Conference on Database Systems for Advanced Applications (DASFAA 2024), pp. 508–512*, Lecture Notes in Computer Science, vol 14856. Springer, 2024

3. PotholeVision: An Automated Pothole Detection and Reporting System using Computer Vision, Z. Jeffreys*, K. Kumar*, Z. Xie*, W. D. Bae, S. Alkobaisi, S. Narayanappa, *Proceedings of the 39th ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2024), pp. 695-697*, 2024

4. A Framework for Abstractive Summarization of Conversational Meetings, V. Marklynn*, A. Sebastian*, Y. L. Tan*, W. D. Bae, S. Alkobaisi, S. Narayanappa, *Proceedings of the 14th IEEE Annual Computing and Communication Workshop and Conference (CCWC 2024), pp. 507-512*, 2024

5. Improving Network Traffic Anomaly Detection through Data Denoising and Unsupervised Learning, J. Talbott*, J. Palicka*, A. Sheardown*, W. D. Bae, M. Horak, *Proceedings of the 14th IEEE Annual Computing and Communication Workshop and Conference (CCWC 2024), pp. 447-453*, 2024

6. Improving Classfication Performance on Rare Events in Data Starved Medical Applications, Wan D. Bae, A. Alfonso*, D. Stanko*, L. Hao*, L. Le*, M. Horak, *Proceedings of the 18th IEEE International Symposium on Medical Measurements and Applications (MEMEA 2023), pp. 1-6*, 2023

7. A Study of the effectiveness of transfer learning in individualized asthma risk prediction, W. D. Bae, S. Alkobaisi, M. Horak, S. Kim, CS. Kim and M. Chesney*, *Proceedings of the 36th ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2021)*, 1082-1085, 2021

8. A two-step approach to predictive modeling of individual-based environmental health risks, W. D. Bae, M. Horak, S. Alkobaisi, S. Kim, S. Narayanappa, CS. Park and D. J. Bae*, *Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2019)*, 729-738, 2019

9. A framework for estimating execution times of IO traces on SSDs, Y. Kang*, Y. Jo*, J. Cha, W. D. Bae and SW. Kim, *Proceedings of the 26th ACM International Conference on Information and Knowledge Management (CIKM 2017)*, 2123-2126, 2017

10. A Bayesian framework for individual exposure estimation on uncertain paths, M. Horak, W. D. Bae, S. Alkobaisi, S. Kim and W. Meyers*, *Proceedings of the 15th International Symposium on Web and Wireless GIS (W2GIS 2017)*, 83-99, 2017

11. Voronoi maps: An approach to individual-based environmental exposure estimation, W. D. Bae, S. Alkobaisi, W. Meyers*, S. Narayanappa and P. Vojtěchovský, *Proceedings of the 31st ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2016)*, 596-603, 2016

12. An energy-conserving algorithm for the collection and reporting of data in mobile sensor networks, M. Horak and S. Alkobaisi and W. D. Bae, *Proceedings of the 23rd ACM SIGSPATIAL Geographic Information Systems (ACM GIS 2015), MobiGIS workshop*, 50-58, 2015

13. SCHAS: A visual evaluation framework for mobile data analysis of individual exposure to environmental risk factors, S. Alkobaisi, W. D. Bae and S. Narayanappa, *Proceedings of the 14th International Symposium on Spatial and Temporal Databases (SSTD 2015)*, 484-490, 2015

14. Ultra wideband indoor positioning system in support of emergency evacuation, L. Zhang, S. Alkobaisi, W. D. Bae and S. Narayanappa, *Proceedings of the 11th ACM SIGSPATIAL Geographic Information Systems (ACM GIS 2013), International Workshop on Indoor Spatial Awareness*, 2013

15. MobiS: A distributed paradigm for mobile sensor data analytics for evaluating environmental exposure, W. D. Bae, S. Alkobaisi, S. Narayanappa and K. Y. Bae, *Proceedings of the 20th ACM SIGSPATIAL Geographic Information Systems (ACM GIS 2012), MobiGIS workshop*, 93-96, 2012

16. A mobile data analysis framework for environmental health decision support, W. D. Bae, S. Alkobaisi, S. Narayanappa and C. Liu, *Proceedings of the 9th International Conference on Information Technology: New Generations (ITNG 2012)*, 155-161, 2012

17. Health monitoring systems using patient trajectory analysis and environmental factors, W. D. Bae, S. Alkobaisi and S. Narayanappa, *Proceedings of the 4th International Conference on Advanced Geographic Information Systems, Applications, and Services (GeoProcessing 2012)*, 147-151, 2012

18. Steel threads: Framework for developing software system architecture, S. Narayanappa, W. D. Bae and S. Alkobaisi, *Proceedings of the 20th International Conference on Software Engineering and Data Engineering (SEDE 2011)*, 109-114, 2011

19. Geographic Information Systems: RSL services definitions of a framework for Web services, O. Testa, G.n Montejano, D. Riesco and W. D. Bae, *Proceedings of the 26th International Conference on Computers and Their Applications (CATA 2011)*, 66-71, 2011

20. Convex onion peeling: Efficient data structure for point feature label placement, W. D. Bae, S. Alkobaisi and S. Narayanappa, *Proceedings of the 25th ACM Symposium on Applied Computing (ACM SAC 2010)*, 892-899, 2010

21. Robust TCP migration techniques for server failure, S. Narayanappa, W. D. Bae and S. Alkobaisi, *Proceedings of the 23rd International Conference on Computer Applications in Industry and Engineering (CAINE 2010)*, 67-73, 2010

22. The Truncated Tornado in TMBB: A spatiotemporal uncertainty for moving objects, S. Alkobaisi, P. Vojtěchovský, W. D. Bae, S. T. Leutenegger and S. H. Kim, *Proceedings of the 20th International Conference on Database and Expert Systems Applications (DEXA 2008)*, 33-40, 2008

23. MBR models for uncertainty regions of moving objects, S. Alkobaisi, W. D. Bae, B. Yu and S. H. Kim, *Proceedings of the 13th International Conference on Database Systems for Advanced Applications (DASFAA 2008)*, 126–140, 2008

24. Supporting range queries on Web data using k-Nearest Neighbor search, W. D. Bae, S. Alkobaisi, S. H. Kim, S. Narayanappa and C. Shahabi, *Proceedings of the 7th International Symposium on Web and Wireless GIS (W2GIS 2007)*, 61-75, 2007

25. Supporting range queries on Web data using k-Nearest Neighbor search, W. D. Bae, S. Alkobaisi, S. Ho Kim, S. Narayanappa and C. Shahabi, *Proceedings of the 10th International Workshop on the Web and Databases (WebDB 2007)*, 2007

26. An interactive framework for raster data spatial joins, W. D. Bae, Petr Vojtěchovský, S. Alkobaisi, S. T. Leutenegger and S. H. Kim, *Proceedings of the 15th ACM International Symposium on Advances in Geographic Information Systems (ACM GIS 2007)*, 19-26, 2007

27. The Tornado model: Uncertainty model for continuously changing data, B. Yu, S. H. Kim, S. Alkobaisi, W. D. Bae and T. Bailey, *Proceedings of the 12th International Conference on Database Systems for Advanced Applications (DASFAA 2007)*, 624-636, 2007

28. An incremental refining spatial join algorithm for estimating query results in GIS, W. D. Bae, S. Alkobaisi and S. T. Leutenegger, *Proceedings of the 17th International Conference on Database and Expert Systems Applications (DEXA 2006)*, 935-944, 2006

Thesis

- Online query processing in Geographic Information Systems, Ph.D. thesis (advisor: Professor Scott T. Leutenegger), Department of Computer Science, University of Denver, 2007

Book chapters

- Online query processing in Geographic Information Systems: Statistical and probabilistic approaches, with S. Alkobaisi, *VDM*, 2009

- Continuously changing data in spatiotemporal databases: Managing uncertainty of moving objects, with S. Alkobaisi, *VDM*, 2009

Students Supervised

PhD stuents

- Yoonsuk Kang, *A framework for estimating execution times of IO Traces on SSDs*, Dept of Computer Science, Hanyang University, South Korea, co-supervisor with Sangwook Kim, 03/2016 - 08/2017

MS students

- Rohit Nagotkar, Siri Chandana Vemaraju, *AI-powered Unoccupied Systems and Deep Learning for Crop Disease Detection*, Dept of Computer Science, Seattle University, 04/2024 - current

- Siddheshwari Bankar, *SMOTE Boost with control coefficient for rare event prediction*, Dept of Computer Science, Seattle University, 04/2023 - current

- Sartaj Bhuvaji and William McDonnell, *Autoencoders for synthetic tabular data generation*, Dept of Computer Science, Seattle University, 04/2023 - current

- Ankita Kadam, *Unsupervised clustering and SMOTE to tackle imbalanced class data*, Dept of Computer Science, Seattle University, 04/2023 - current

- Madhuroopa Krukulla and Jay Singhvi, *A study of transfer learning for rare health events prediction*, Dept of Computer Science, Seattle University, 04/2023 - current

- Zachary Jeffreys, *An automated pothole detection and reporting system*, Dept of Computer Science, Seattle University, 04/2023 - 12/2023

- James Talbott, *Network traffic anomaly detection using unsupervised learning*, Dept of Computer Science, Seattle University, 04/2023 - 12/2023

- Vincent Marklynn, Anjali. Sebastian and Yong L. Tan, *A framework for abstractive summarization of conversational meetings*, Dept of Computer Science, Seattle University, 04/2023 - 12/2023

- Vindhya Jayachandran, *A study of transfer learning for early detecgtion of plant diseases*, Dept of Computer Science, Seattle University, 01/2022 - 03/2023

- Lili Hao, *Transfer learning for tabular data*, Dept of Computer Science, Seattle University, 03/2021 - 09/2022

- Peter Loyd, *Machine learning on plant pathology*, Dept of Computer Science, Seattle University, 03/2021 - 06/2022

- Mark Chesney, *Personalized asthma risk prediction with transfer learning*, Dept of Computer Science, Seattle University, 03/2020 - 09/2020, now data science consultant at Novo Nordisk

- Won Seok Seo, *Performance improvement of machine learning techniques predicting asthma health risk*, Dept of Computer Science, Seattle University, 10/2019 - 03/2020, now software engineer at Bloomburg LP

- Jongwon Lee, *Performance improvement of machine learning techniques predicting asthma health risk*, Dept of Informatics, Technical University of Munich, Germany, 09/2017 - 12/2019, now software engineer at Kakao Enterprise

Undergraduate students

- Alivia Zhao and Garland Lau, *GeoAI for Personalized Walkable Path Planning*, CSE Summer Undergraduate Research, Seattle University, 06/2024 - current

- Nathan Tran, *AI-powered Unoccupied Systems and Deep Learning for Crop Disease Detection*, Dept of Computer Science, Seattle University, 04/2024 - current

- Angelo Alfonso, David Stanko and Linh Le, *Personalized Asthma Risk Prevention: Synthetic Oversampling for Enhanced Classification on Imbalanced Data*, CSE Summer Undergraduate Research, Seattle University, 06/2022 - 04/2023

- Ojeet Deol and Bryce Chinn, *Personalized Health Risk Prediction of Environmentally Triggered Chronic Diseases Using Deep Leaning*, CSE Summer Undergraduate Research, Seattle University, 06/2021 - 12/2021

- Kyle Fraser, *Automating tree health monitoring from images and geospatial information*, CSE Summer Undergraduate Research, Seattle University, 06/2021 - 06/2022

- Joel Davidson, *Spatio-temporal modeling of environmental health risk using geographical information*, Seattle University, 11/2020 - 06/2021

- Yinying Liang, *Constrained spatial clustering in the presence of obstacles*, Seattle University, 11/2020 - 06/2021

- Ethan Chatfield, *Seasonal and locational analysis of urban carnivores in great Seattle area*, CSE Summer Undergraduate Research, Seattle University, 06/2020 - 09/2020

- Whan-il Yoo and Hyun-han Kim, *An improved Kalman Filter method for identifying false GPS data*, Hanyang University, South Korea, 08/2016 - 06/ 2017

- Wade Meyers, *Statistical approaches for estimating individual-based environmental exposures*, UW-Stout, 09/2014 - 03/2016

- Nicholas Gauvin and Erik Gunderson, *A mobile application and sensor device development for health data acquisition*, UW-Stout, 09/2013 - 06/2015

- Eric Bonsness and Jason Gass, *A data acquisition system for managing environmental exposures*, UW-Stout, 09/2012 - 06/2014

- Andrew Christie and Richard Johnson, *A visual evaluation framework for moving objects*, UW-Stout, 09/2011 - 06/2012

- Ronnie Obermueller and Josh Herbert, *An automated GPS data acquisition and visualization*, UW-Stout, 09/ 2009 - 06/2011

High school students

- Nikhil Mehta and Aaditya Prasad, *Diseased Crop Detection from UAV Based Images Using Novel GAN Applications Alongside a Machine Learning Classifier*, Tesla STEM High School, Redmond, WA, Washington State Science and Engineering Fair, 09/2020 - 08/2021

Undergraduate student presentations

- Angelo Alfonso, David Stanko, and Linh Le, *Personalized Asthma Risk Prevention: Synthetic Oversampling for Enhanced Classification on Imbalanced Data, A poster presentation at the National Conference on Undergraduate Research (NCUR) 2023, Eau Claire, WI*, April 2023

- Kyle Fraser, Ojeet Deol, and Bryce Chinn, *Individual-Level Environment Exposure Estimation Using Reinforcement Learning, A poster presentation at the National Conference on Undergraduate Research 2022*, Online, April 2022

- Kyle Fraser and Peter Loyd (graduate student), *Machine learning for plant health monitoring and diagnosis, Pacific Northwest Citizen Science Summit*, Online, October 2021

- Seasonal and locational analysis of carnivores in an urban Setting with visualization and evaluation of clusters, Y. Liang and E. Chatfield, Seattle University, *A poster presentation at the National Conference on Undergraduate Research 2021*, Online, April 2021

- An improved Kalman Filter method for identifying false GPS data, W.I. Yoo and H.H. Kim, Hanyang University, South Korea, *a poster presentation at Hanyang University Research Fair*, South Korea, August 2017

- Wireless sensor module development for environmental exposures, J. Gass and E. Bonesness, UW-Stout, *a poster presentation in Rotunda*, Madison, WI, May 2014

- A framework for individual health monitoring of asthma patients, J. Gass and E. Bonesness, UW-Stout, *a poster presentation at the 1st workshop on Smart and Connected Health*, United Arab Emirates University, UAE, January 2014

- A distributed paradigm of mobile sensor data analytics for evaluating environmental exposures, J. Gass, *a poster presentation at the National Conference on Undergraduate Research*, La Crosse, April 2013

- MOViewer: A visual evaluation framework for mobile data analysis, A. Christie and R. Johnson, *a poster presentation at the National Conference on Undergraduate Research*, Ogden, March 2012

- A framework for supporting data analysis of moving objects: automated GPS data acquisition and visualization, J. Herbert and R. Obermueller, *A poster presentation at the National Conference on Undergraduate Research*, Ithaca, March 2011

Awards

- Thomas J. Bannan Endowed Chair of Engineering (2023 - 2025), Seattle University, Febraury 2023

- Provost Fellows Award, Seattle University, 2022 - 2024

- CSE Summer Undergraduate Student/Faculty Research Award, Seattle University, 2020, 2021, 2022

- Best Teaching Award, College of Engineering, Hanyang University, South Korea, 2017

- UW-Stout Emerging Outstanding Researcher Award, University of Wisconsin-Stout, 2011

- ASPIRE-Multicultural Student Services of Excellence Award, University of Wisconsin-Stout, 2011

- Best Teaching Assistant Award, School of Engineering and Computer Science, University of Denver, 2007

Grants

External grants (funded)

- Environmentally Triggered Asthma Prediction in Indoor Environment using Machine Learning, international collaborator and consultant with PIs Shayma Alkobasi and Najah Abu Ali, National Faculty Research Program (NFRP), United Arab Emirates, AED 255,000 (approx. $70,000), 09/023 - 08/2025

- Predictive and preventive asthma management for the elderly, *Genome Research Center for Allergy and Respiratory Diseases at Bucheon Hospital*, Sooncheonhyang University, South Korea, consultant, $6,000, 09/2019 – 08/2020

- Promoting opportunities for women in engineering, *National Research Foundation: Education Division*, South Korea, Co-PI with PI Chae-Ok Yun, $1,391,000, 09/2016 - 12/2018

- Spatio-temoral modeling, optimization and analysis of mobile senser data for estimation, evaluation and prediction of individual esposure to environmental risk factors, *Faculty Research Funds*, Hanyang University, PI, $20,000, 03/2016 - 08/2017

- Spatio-temporal modeling, optimization and analysis of mobile sensor data for estimation, evaluation and prediction of individual exposure to environmental risk triggers, *Stout Foundation*, PI, $49,000, 01/2015 - 12/2017

- A Real-time monitoring and analysis system for evaluating environmental exposures, *Information and Communication Technology (ICT) Fund*, United Arab Emirates, Co-PI with PI Shayma Alkobaisi, AED 2,750,000 ($748,400), 03/2014 - 08/2018

- US - UAE planning visit: Development of research collaborations on spatio-temporal modeling and analysis of individual exposure to various environmental conditions, *National Science Foundation: Catalyzing New International Collaborations*, PI with Co-PI Cheng Liu, $34,597, 10/2013 - 09/2014

External grants (under review)

- Implementing a Science, Technology and Society Undergraduate Certificate Program, PI: Julie Holman (Communication and Meda), Co-PI: Yen-Lin Han (Mechanical Engineering), members of the impelmentation team: Wan D. Bae (CS), Rellihan (Philosophy), and Matthew Whitlock (Theology and Religious Studies), *National Endowment for the Humanities: Humanities Connections Implementation Grants*, $149,848, September 2023

External grants (not funded)

- Collaborative research: Enabling optimal interventions to patient self-management through behavioral and environmental sensing and computational modeling, Co-PI with PI Sehjeong Kim at United Arab Emirates, *National Research Foundation, United Arab Emirates*, AED 450,000 ($122,500), 2017

- SCH: INT: RUI: Collaborative Research: Enabling optimal interventions for patient self-management through behavioral and environmental sensing and computational modeling, *National Science Foundation*, PI with Co-PI Cheng Liu, $991,970, 2015

- Development of a real-time environmental health nonitoring and analysis system for asthma attack prevention, *The Korean Federation of Science and Technology Societies: Brain Pool Project*, Co-PI with PI Cha Ho Chung at Yonsei University, $60,000, 2015

Internal grants

- Personalized Asthma Risk prevention: Synthetic Oversampling for Enhanced Classification on Imbalanced Data, *SU CSE Summer Undergraduate Research*, Seattle University, $6,000, 2022

- A data acquisition and visualization system development to support data mining in moving object databases, *Faculty Research Initiative Grant*, UW-Stout, PI with Co-PIs Cheng Lui, $10,000, 2011

- A framework for data mining in moving object databases, *Research Incubator Grant*, UW-Stout, PI with Co-PIs Cheng Lui, $10,000, 2010

- A data acquisition system development to support moving objects in spatiotemporal databases and health-care monitoring system development, *STEM College Research Grant*, UW-Stout, PI with Co-PI Cheng Liu, $3,000, 2010

- An Assessment of GPS Technology and Data Acquisition To support Moving Objects Databases, *Indirect Research Grant*, UW-Stout, $3,000, 2010

- UW-Stout travel grant to attend the conferences for preseantions, UW-Stout, 2009, 2010, 2011, 2012, 2013, 2014

Professional Presentations and Meetings

Contributed conference talks

- Incremental SMOTE with Control Coefficient for Classifiers in Data Starved Medical Applications, *the 26th International Conference on Big Data Analytics and Knowledge Discovery (DAWAK 2024)*, Nales, August 2024

- SDGnE: A Synthetic Data Generation and Evaluation System for Rare Event Prediction, *the 29th International Conference onDatabase Systems for Advanced Applications (DASFAA 2024)*, Gifu, July 2024

- PotholeVision: An Automated Pothole Detection and Reporting System using Computer Vision, *the 39thACM/SIGAPP Symposium on Applied Computing (ACM SAC 2024)*, Avila, April 2024

- A Framework for Abstractive Summarization of Conversational Meetings, *the 14th Annual Computing and Communication Workshop and Conference (CCWC 2024)*, Las Vegas, January 2024

- Improving Network Traffic Anomaly Detection through Data Denoising and Unsupervised Learning, *the 14th Annual Computing and Communication Workshop and Conference (CCWC)*, Las Vegas, January 2024

- Improving Classfication Performance on Rare Events in Data Starved Medical Applications, *the 18th IEEE International Symposium on Medical Measurements and Applications (MEMEA) 2023*, Jeju, South Korea, June 2023

- A Study of the effectiveness of transfer learning in individualized asthma risk prediction, *the 36th ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2021)*, Online, April 2021

- A two-step approach to predictive modeling of individual-based environmental health risks, *the 34th ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2019)*, Limassol, Cyprus, April 2019

- A Bayesian framework for individual exposure estimation on uncertain paths, *the 15th International Symposium on Web and Wireless GIS (W2GIS 2017)*, Shanghai, China, May 2017

- Voronoi maps: An approach to individual-based environmental exposure estimation, *the 31st ACM/SIGAPP Symposium on Applied Computing (ACM SAC 2015)*, Pisa, Italy, May 2015

- Ultra wideband indoor positioning system in support of emergency evacuation, *the 11th ACM SIGSPA-TIAL Geographic Information Systems (ACM GIS 2013) Workshop on Indoor Spatial Awareness*, Orlando, November 2013

- Mobis: A distributed paradigm for mobile sensor data analytics for evaluating environmental exposure, *the 10th ACM SIGSPATIAL Geographic Information Systems (ACM GIS 2012) MobiGIS*, Redondo Beach, November 2012

- A mobile data analysis framework for environmental health decision support, *the 9th International Conference on Information Technology: New Generations (ITNG 2012)*, Las Vegas, March 2012

- Steel threads: Framework for developing software system architecture, *the 20th International Conference on Software Engineering and Data Engineering (SEDE 2011)*, Las Vegas, June 2011

- Geographic Information Systems: RSL services definitions of a framework for Web services, *the 26th International Conference on Computers and Their Applications (CATA 2011)*, New Orleans, March 2011

- Robust TCP migration techniques for server failure, *the 23rd International Conference on Computer Applications in Industry and Engineering (CAINE 2010)*, Las Vegas, November 2010

- An interactive framework for spatial joins: A statistical approach for data analysis in GIS, Advances in Research (AIR) Presentation, *Midwest Instruction and Computing Symposium (MICS 2010)*, Eau Claire, April 2010

- An interactive framework for raster data spatial joins, *the 15th ACM International Symposium on Advances in Geographic Information Systems (ACM GIS 2007)*, Seattle, November 2007

- An incremental refining spatial join algorithm for estimating query results in GIS, *the 27th International Conference on Database and Expert Systems Applications (DEXA 2006)*, Krakow, Poland, September 2006

Seminar and colloquia talks

- A Synthetic Data Generation and Evaluation System for Rare Event Prediction in Medical Applications, , *Invited Seminar*, Soonchunhyang University Bucheon Hospital, South Korea, July 2024

- Transfer learning in medical applications, *Invited Seminar*, Department of ICT Environmental Health System and Department of Environmental Sciences, Soonchunhyang University, South Korea, June 2023

- Computational approaches to solving publich health problems: a study of the effectiveness of transfer learning in personalized models in health data analytics, *Invited Seminar*, Joint seminar of Department of ICT Environmental Health System and Department of Environmental Sciences, Soonchunhyang University, South Korea, September 2022

- Machine learning to advance environmental health research and Decision, *The 2nd Forum of Environments and Public Health Monitoring Platform*, Korea Environmental Industry & Technology Institute and Korean Society for Indoor Environment, online, November 2020

- From public to individual: transfer learning for asthma health risks, *Asthma - Environment Data Analysis Seminar*, Sooncheonhyang University Buchoen Hospital, South Korea, December 2019

- Spatio-temporal data analysis in health informatics, *Machine Learning Seminar*, The Evergreen State College, Olympia, March 2019

- Applied computatonal geometry: exposure estimation using Voronoi diagrams, *Data Mining Seminar*, Colorado College, Colorado Srpings, February 2019

- A new paradigm of predictive and exposome analytics, *Machine Learning & AI Seminar*, School of Public Health, Hanyang University, Seoul, South Korea, May 2017

- Smart care and smart live: Analysis of asthma patient data with vector autoregression and quantile regression, *Genome Research Center for Allergy and Respiratory Diseases*, Sooncheonhyang Hospital, Bucheon, South Korea, April 2017

- A big data framework for medical informatics, *Respiratory Medicine Research Seminar*, School of Medicine, Hanyang University, Seoul, South Korea, October 2016

- Spatio-temporal modeling, optimization and analysis of mobile sensor data for estimation, evaluation and prediction of individual exposure to environmental risk triggers, *BK21 Research Seminar*, School of Electronic and Electrical Engineering, Yonsei University, Seoul, South Korea, March 2015

- Computing and healthcare, *CS Seminar*, Ateneo de Manila University, Manila, Philippines, January 2015.

- A framework for spatio-temporal modeling and data analysis in evaluating environmental exposures, *1st Workshop on Smart and Connected Health, United Arab Emirates University*, Al Ain, UAE, January, 2014

- UWB based indoor positioning systems, *14th KOCSEA Technical Symposium*, San Jose, December 2013

- A mobile data analysis framework for environmental health decision support, *Research Seminar*, College of Information Technology, United Arab Emirates University, Al Ain, UAE, May 2013

- Uncertainty management for moving objects databases, *Research seminar*, *Research Seminar*, College of Information Technology, United Arab Emirates University, Al Ain, UAE, June 2012

- Early career challenges and opportunities in the spatial and spatiotemporal databases and data mining, *Panel Talk, 12th International Symposium on Spatial and Temporal Databases*, Minneapolis, August 2011

- Undergraduate research in Geographic Information Systems, *Research Seminar*, College of Information Technology, United Arab Emirates University, Al Ain, UAE, May 2011

- Map/Reduce paradigm for mobile sensor data, *12th KOCSEA Technical Symposium*, San Jose, December 2011

- A framework for data analysis in moving objects databases, *Research Seminar*, USGS Upper Midwest Environmental Sciences Center, La Crosse, June 2010

Professional Contributions

Exterrnal committees

- CLEP Information Systems Development Committee, The College Board, 2023 - current

- NSF Proposal Review Panel, 2022, 2023

- Vermont Biomedical Research Network (VBRN) Review Committee, 2022, 2023

Industry advisory board

- Advisory board member, Smartdash AI (AI start-up, CEO: Zacharh Jeffrey), since August 2023

- Advisory board member, Geospaces (AL/ML start-up, CEO: Megna Gowda), since August 2023

Referee for professional journals

- Journal of Medical Systems, since 2023

- ACM Transactions on Spatial Algorithms and Systems, since 2021

- Journal of Ambient Intelligence and Smart Environments, since 2018

- Journal of Geo Information, since 2017

- Journal of Applied Information Science, since 2012

- Journal of Computer Science and Technology, since 2010

- Journal of Distributed and Parallel Databases, 2012 - 2015

- Journal of Geographical Information Science, 2010 - 2015

Referee for proceedings

- ACM SAC Technical Symposium, 2019, 2021, 2022, 2023, 2024

- ACM SIGCSE Technical Symposium, 2021, 2022, 2023

- International Conference on Information Technology: New Generations, 2011 - 2015

- ACM SIGSPATIAL GIS, International Workshop on MobiGIS, 2012 - 2015

- ISCA International Conference on Software Engineering and Data Engineering, 2011 - 2014

- IEEE Mobile Database Management, 2012

- IEEE International Conference on Industrial Informatics, 2011 - 2013

- Business Intelligence & Data Warehousing, 2009, 2010, 2011

- Transactions on Information Technology: Theory and Applications, since 2008 - 2010

- International Conference on Informatics, Cybernetics, and Computer Applications, 2010

- International Conference on Information Resources Management, 2009

Conference/Workshop organizer

- Co-chair of Sponsorship committee, the 32nd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL), 2024

- Co-chair of Sponsorship committee, the 31st ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL), 2023

- Co-chair of ACM/NSF travel grant committee, the 31st ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL), 2023

- Member of the organizing committee, Pacific Northwest Citizen Science Summit, 2023

- Co-chair of local arrangement, the 30th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL), 2022

- Orgnizer of Pacific Northwest Citizen Science Summit, *Expanding Our Impact*, October 2022

- Session chair, the 36th ACM/SIGAPP Symposium on Applied Computing, online, April 2021

- Co-program director, the 1st workshop on promoting opportunities for women in engineering , Hanyang University, Seoul, South Korea, May 2017

- Co-chair, the 2nd workshop on Smart and Connected Health: Modeling and Analysis of the Effect of Environmental Exposure on Public Health, an NSF funded project, Al Ain, United Arab Emirates, February 21 - 22, 2016

- Co-chair, the 1st workshop on Smart and Connected Health: Modeling and Analysis of the Effect of Environmental Exposure on Public Health, an NSF funded project, Al Ain, United Arab Emirates, January 8 - 9, 2014

- Co-chair of KOCSEA Scholarship/Poster, the 14th Korean Computer Scientist and Engineering Association in America (KOCSEA) Technical Symposium, December 2013

- Co-organizer of the track on Information Systems and Internet Technology, the 9th International Conference on Information Technology: New Generations 2012

- Chair of research track on Multidimensional Query Processing, the 12th International Symposium on Spatial and Temporal Databases, Minneapolis, MN, August 2011

University Service Activities

Service activities at Seattle University

University	member	Academic Assembly	09/2023 - current
	member	DEI Committee of SU Board of Trustees	06/2021 - 12/2023
	member	Advising Task Force Group	03/2021 - 09/2022
	member	VP for Enrollment Management Search Committee	12/2019 - 12/2020
College	panel	CSE Academic Grievance Board	01/2020 - current
	member	ME Dept. Faculty Promotion Committee	10/2023
	peer evaluator	ME Dept Faculty Teaching Review	02/2023 - 04/2023
Department	co-organizer	CS Seminar Series	01/2020 - current
	co-chair	CS Depart Chair Search Committee	09/2023 - 03/2024
	peer evaluator	CS Dept Tenure Track Faculty Teaching Review	04/2023 - 06/2023
	co-chair	CS Dept Assistant Teaching Professor Search Committee	10/2022 - 03/2023
	member	CS Dept Tenure Track Faculty Search Committee	10/2021 - 03/2022
	member	CS Curricum Committee	02/2020 - 08/2022
	member	CS Dept Senior Associate Search Committee	06/2021

Service activities at prior institutes

University of Wisconsin - Stout

University	member	Chancellor's Diversity Leadership Team	2013 - 2015
	member	Program Review Committee	2014 - 2015
	member	Personnel Policies Committee	2014 - 2015
	member	General Education committee	2013 - 2015
	member	Racial Studies & Global Perspective Curriculum Committee	2013 - 2015
	member	Infusing Diversity across the Curriculum Cohesive Group	2013 - 2015
	member	Educational Activities Committee	2011 - 2015
	member	Equal Opportunities in Education Committee	2011 - 2014
	member	Admissions and Credit Appeals Committee	2011 - 2013
	member	Professional Development Committee,	2011 - 2012
	member	UW-Stout Committee on Research Experiences	2009 - 2017
	advisor	Multicultural Student Services	2009 - 2015
Department	member	Math Faculty Search Committee	2014, 2017
	member	Faculty search Committee	2010 - 2014
	member	Spring MAA Organization Committee	2010 - 2012
	member	Program Advisory Committee	2009 - 2015
	member	MSCS Colloquium Committee	2010 - 2015
	chair	CS textbook search Committee	2010 - 2015
	advisor	AMCS Women's Group	2009 - 2015

Hanyang University, South Korea

College	co-director	WE-UP program: Women in Engineering	2016 - 2017

Computer Skills

C/C++, Java, Object-oriented design paradigm, Perl, Python, R, Matlab, Mathematica, Socket programming, Java RMI, pthread, SQL, JDBC, Oracle, MySQL, Postgres, Solaris, JSP/Java servlet, CGI, Struts, JavaScript, HTML, PHP, Macromedia Flash ActionScript, LateX, Cygwin, awk, Korn, tcsh, make, CVS, GitHub, and Map/Reduce programming on Hadoop distributed systems.

Last updated: September 8, 2024