David W. Wanik, PhD

Associate Professor In-Residence
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SUMMARY

As an Associate Professor In-Residence at UConn, I specialize in preparing the next generation of data scientists through graduate courses in deep learning, optimization, and cloud computing. My research and practice live at the intersection of IoT analytics and remote sensing, with a specialized focus on the electric utility industry (storm outage forecasting, energy demand forecasting, tree trimming planning, storm restoration optimization.) Beyond the classroom, I am the faculty lead for BittBridge, driving UConn's initiatives in the emerging field of decentralized AI.

HIGHLIGHTS

- Work experience in academia, insurance, and utilities.
- Attracted >$4M in research funding as PI, co-PI, or Senior Personnel for my research on natural hazards, energy analytics and business analytics.
  - Collaborators and co-authors include researchers from Oak Ridge National Laboratory, the US Environmental Protection Agency, NASA, and Eversource Energy.
  - Patent awarded for storm outage model (co-developed with researchers University of Connecticut) in 2021 and licensed to leading weather analytics company.
  - >20 peer-reviewed journal articles, with more manuscripts under review and in preparation.
- Developed three data science-related graduate courses: "ENVE 5331: Predictive Analytics for Scientists and Engineers" (UConn School of Engineering, 2016); "OPIM 5509: Introduction to Deep Learning" (UConn School of Business, 2019); "OPIM 5516: Advanced Deep Learning" (UConn School of Business, 2026.
- Winner of 'Excellence in Graduate Teaching' (2024) and 'Innovation in Teaching' awards (2022) from UConn School of Business. Nominated for 'CETL University Teaching Fellow' (2026).

CURRENT ACADEMIC APPOINTMENTS

- University of Connecticut – School of Business, Dept. of Operations and Information Management, Associate Professor In-Residence (2019 –present)
- University of Connecticut – School of Business; Academic Director for Business Data Analytics (2020 –present)
- University of Connecticut – School of Engineering; Associated Faculty in Dept. of Civil and Environmental Engineering (2024 – present)

EXPERTISE

- **Skills:** data science, deep learning, statistics, geospatial data processing, optimization.
- **Research:** weather-impact modeling for infrastructure networks, energy demand forecasting for different climate scenarios, integration of renewables, decision-support systems, infrastructure resilience, emergency preparedness, smart cities.

EDUCATION

University of Connecticut - Storrs, CT

- Ph.D. Environmental Engineering August 2015
  - Advisor: Emmanouil N. Anagnostou
- M.S. Environmental Engineering December 2012
  - Advisor: Emmanouil N. Anagnostou
- B.S. Environmental Science, *cum laude* August 2011
  - Advisor: John C. Clausen

TEACHING EXPERIENCE

*****denotes new course developed by DW that has been added to UConn course catalog*

- OPIM 3510: Business Data Analytics I
- OPIM 3511: Business Data Analytics II
- OPIM 3802: Data and Text Mining
- OPIM 5502: Big Data Analytics with Cloud Computing
- OPIM 5509: Introduction to Deep Learning*****
- OPIM 5512: Data Science with Python
- OPIM 5516: Advanced Deep Learning
- OPIM 5603: Statistics in Business Analytics
- OPIM 5641: Business Decision Modeling
- ENVE 5331: Predictive Analytics for Scientists and Engineers*****

SCHOLARLY/CREATIVE RECORD

REFEREED JOURNAL ARTICLES

1. Cosby, Arthur G; Lebakula, Viswadeep; Smith, Ciarra. N.; **Wanik, David. W.;** Bergene, Karissa; Rose, Amy; (2024). "Accelerating growth of human coastal populations at the global and continent levels: 2000–2018". Scientific Reports. 14, Article number: 22489
2. Udeh, K., **Wanik D.**, Aguiar, D., Cerrai, D. and Anagnostou E.; "Probabilistic Storm and Electric Utility Customer Outage Prediction". IEEE Access. Accepted August 2024.
3. Sahin B., Udeh K., **Wanik D. W.**, Cerrai D., 2024: 'Predicting Energy Demand Using Machine Learning: Exploring Temporal and Weather-Related Patterns, Variations, and Impacts', IEEE Access Journal, Accepted February 2024.
4. Lebakula V., Datla V., **Wanik D. W.**, Cosby A. G., 2024: 'Predicting County-Level Population from VIIRS Nighttime Light Imagery with Deep Learning', IEEE Sensors Journal, Accepted February 2024.
5. Taylor, W., Cerrai, D., **Wanik D.**, Koukoula, M., Anagnostou, E., 2023 'Community Power Outage Prediction Modeling for the Eastern United States', Energy Reports, Accepted October 2023.
6. Hughes W., Zhang W., Cerrai D., Bagtzoglou A. C., **Wanik D. W.**, Anagnostou E. N., 2022: "A Hybrid Physics-Based and Data-Driven Model for Power Distribution System Infrastructure Hardening and Outage Simulation", Reliability Engineering & System Safety, Volume 225.
7. Chang C. F., Garcia V., Tang C., Vlahos P., **Wanik D. W.**, Yan J., Bash J. O., Astitha M., 2021: "Linking multi-media modeling with machine learning to assess and predict lake chlorophyll-a concentrations", Journal of Great Lakes Research, Volume 47, Issue 6, 2021, Pages 1656-1670, ISSN 0380-1330, https://doi.org/10.1016/j.jglr.2021.09.011.

8. Hughes W., Zhang W., Bagtzoglou A. C., **Wanik, D. W.**, Pensado, O., Yuan, H., Zhang J, 2021: "Resilience Hardening Strategy and Damage Modeling Framework for Overhead Power Distribution Systems", Reliability Engineering and System Safety. https://doi.org/10.1016/j.ress.2020.107367
9. Walsh, T., **Wanik D. W.**, Anagnostou E.N., Mellor J., 2020: "Estimated Time to Restoration of Hurricane Sandy in a Future Climate". Sustainability 2020, 12(16), 6502. https://doi.org/10.3390/su12166502
10. Watson P., Cerrai D., **Wanik D. W.**, Anagnostou E. N., 2020: "A Weather-Related Power Outage Model with a Growing Domain: Structure, Performance, and Generalizability", The Journal of Engineering.
11. Alpay B. A., **Wanik D. W.,** Watson P., Liang G., Anagnostou E. N., 2020: "Dynamic Modeling of Power Outages Caused by Thunderstorms", Forecasting, 2(2), 151-162; https://doi.org/10.3390/forecast2020008
12. Yang F., **Wanik D. W.**, Cerrai D., Bhuiyan M. A. E., Anagnostou E., 2020: "Quantifying Uncertainty in Machine Learning-Based Power Outage Prediction Model Training: A Tool for Sustainable Storm Restoration", Sustainability 12 (4), 1525. https://doi.org/10.3390/su12041525.
13. Cerrai D., **Wanik D. W.,** M.A.E. Bhuiyan, Zhang X., Yang J., Frediani M., Anagnostou E. N., 2019: "The Predictability of Power Outages from a New Representation of Weather and Vegetation Impacts in Non-Parametric Modeling", IEEE Access. DOI: 10.1109/ACCESS.2019.2902558.
14. Walsh, T., Layton, T., **Wanik D. W.**, Mellor J., 2018: Agent-Based Model to Estimate Time to Restoration of Storm-Induced Power Outages, Infrastructures Volume 3(3), Page 33. DOI: 10.3390/infrastructures3030033
15. **Wanik, D. W.**, Anagnostou, E. N., Astitha, M., Yang, J., Hartman, B. M., Frediani, M.E., Lackmann, G. M., 2018: "A Case Study on Power Outage Impacts from Future Hurricane Sandy Scenarios" Journal of Applied Meteorology and Climatology. DOI:10.1175/JAMC-D-16-0408.1.
16. **Wanik, D. W.**, He, J., Layton, T., Anagnostou, E. N., Hartman, B. M., 2017: Estimated Time of Restoration (ETR) Guidance for Electric Distribution Networks, Journal of Homeland Security and Emergency Management. https://doi.org/10.1515/jhsem-2016-0063.
17. Pardakhti M., Moharreri E., **Wanik D. W.**, Suib S., Srivastava R., 2017: Predictive Modeling of Methane Adsorption on Hypothetical Metal Organic Frameworks, ACS Combinatorial Science. DOI: 10.1021/acscombsci.7b00056.
18. Cole, T. A., **Wanik, D. W.**, Molthan, A. L., Román, M. O., Griffin, R. E., 2017: Synergistic Use of Nighttime Satellite Data, Electric Utility Infrastructure, and Ambient Population to Improve Power Outage Detections in Urban Areas, Remote Sens. Volume 9, Page 286. DOI: 10.3390/rs9030286
19. **Wanik, D. W.**, Parent, J. R., Anagnostou, E. N., 2017: Using Vegetation Management and LiDAR-Derived Tree Height Data to Improve Outage Predictions for Electric Utilities, Electric Power Systems Research, Volume 146, May 2017, Pages 236–245. DOI: 10.1016/j.epsr.2017.01.039.
20. He, J., **Wanik, D. W.**, Hartman, B. M., Anagnostou, E. N., 2016: Nonparametric Tree- Based Predictive Modeling of Storm Damage to Power Distribution Network, Risk Analysis. DOI:10.1111/risa.12652.
21. **Wanik, D. W.**, Anagnostou, E. N., Hartman, B. M., Frediani, M. E., Astitha, M., 2015: Storm Outage Modeling for an Electric Distribution Network in Northeastern USA, Natural Hazards, Vol 79, p. 1359. DOI:10.1007/s11069-015-1908-2.

PATENTS

1. Emmanouil Anagnostou, **David Wanik**, Brian Hartman, Jichao He; "Systems and Methods for Outage

Prediction", Patent # 11144835, 2021/10/12
https://patentimages.storage.googleapis.com/8a/9b/04/a615a946d800a1/US11144835.pdf

SELECT CONFERENCE PRESENTATIONS

1. CF Chang, M Astitha, VC Garcia, C Tang, P Vlahos, **D Wanik**, J Bash; "Updates on Utilizing Multimedia Modeling and Machine Learning to Investigate Conditions that Affect Chlorophyll-α Concentrations: A Lake Erie Case Study"; 101st American Meteorological Society Annual Meeting, January 2021
2. K. Udeh, **D. W. Wanik**, N. Bassill and E. Anagnostou, "Time Series Modeling of Storm Outages with Weather Mesonet Data for Emergency Preparedness and Response," 2019 IEEE 10th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON), 2019, pp. 0499-0505, doi: 10.1109/UEMCON47517.2019.8992951.
3. T Cole, A Molthan, LA Schultz, MO Roman, **DW Wanik**, "Improvements to Lunar BRDF-Corrected Nighttime Satellite Imagery: Uses and Applications", AGU Fall Meeting Abstracts 2016, IN33B-1817

UNRELEASED WORK

REFEREED JOURNAL ARTICLES – UNDER PREPARATION

- Deep learning time series methods for energy demand forecasting (MC dropout)
- Student grade prediction with collaborative filtering/neural factorization
- Accessible introduction to optimization topics with Pyomo
- Optimizing utility tree trimming planning

GRANT SUPPORT & PROPOSALS

I have been a PI, co-PI or senior personnel on research grants totaling over $4M in funded projects.

GRANT HISTORY

1. UConn CETL GenAI mini-grant, $2.5K, **David Wanik.** Incorporating GenAI and LLMs into OPIM 5641: Business Decision Modeling. Summer 2025.
2. Eversource Energy Center, "CLIMB: Connecticut's Low-carbon, Innovative, and Modernized electric grid for Better resilience", $90,000. Caiwen Ding, Zongjie Wang, **David Wanik,** Marcello Graziano. Submitted April 2023.
3. Eversource Energy Center, "Optigrid: Planning & Optimizing the Power Grid During the Low Carbon Transition in Connecticut"; Caiwen Ding, Mikhail Bragin, Diego Cerrai, **David W. Wanik,** Marcello Graziano (co-I, 20%); $60,000, September 2021– August 2023. Funded.
4. Eversource Energy Center, "Integration of the OPM and Resilience projects to support gridreliability; **David W. Wanik** (PI, 100%); $80,000, May 2020 – September 2022. Funded.
5. Eversource Energy Center, "Fine resolution nowcasting of PV and loads in selected sections of the Eversource Energy grid", Malaquias Peña and David W. Wanik (co-I, 20%); $280,000, May 2020 – September 2022. Funded.
6. DTN, "DTN Outage Modeling Enhancements"; **David W. Wanik** (co-I, 50%), Emmanouil N. Anagnostou; $550,000, August 2016 – July 2020. PI. Funded.
7. Eversource Energy Center, "Evaluation of Grid Resilience Activities with a Total System Performance Assessment Model informed by Optimization and Economic Methodologies", R. Bagtzoglou (PI), Wei Zhang, Paul Borochin, Maria Chrysochoou, **David W. Wanik** (5%); $450,000, October 2016 – December 2019. Co-PI. Funded.
8. Eversource Energy Center, "Expanding the UConn Predictive Storm and Outage Model to Include

MA and NH", E. Anagnostou (PI), **David W. Wanik** (30%) and Marina Astitha, $500,000, August 2016 – December 2019. Co-PI. Funded.

9. Eversource Energy Center, "Next Generation Predictive Storm & Damage Modeling Enhancements for Preparedness and Emergency Response Support"; Emmanouil N. Anagnostou (PI), Marina Astitha and **David W. Wanik** (20%); $2.37M, September 2015 – December 2019. Senior Personnel. Funded.
10. United Illuminating Company, "Phase 2 of the United Illuminating Outage Prediction Model for Preparedness and Emergency Response Support", E. Anagnostou (PI), **David W. Wanik** (30%) and Marina Astitha $275,000, July 2016 – December 2018. Co-PI. Funded.
11. Eversource Energy Center, "Evaluation of Airborne and Mobile LiDAR Technologies for Monitoring Roadside Vegetation and Utility Infrastructure"; Jason R. Parent (PI), John C. Volin, Emmanouil N. Anagnostou, **David W. Wanik** (5%), Tom Meyer, and Wei Zhang; $338,000, September 2015 – December 2016. Senior Personnel. Funded.

SUBMITTED PROPOSALS – UNDER REVIEW

1. NSF WISER, "Predicting Heatwave driven power outages for Operational Grid resilience- Phase I", 100K. Tasnim Zaman and David Wanik. December 2026.

2. Tomorrow.io, "Real-time Damage Assessment Model with Weather Nowcasting", 60K. Diego Cerrai (PI), Emmanouil Anagnostou, Marina Astitha, and Dave Wanik (co-PI). July 2025.

UNFUNDED PROPOSALS

1. Lenovo Group, "Deep Generative Model-Based Weather Nowcasting", 89K. Dongjin Song and David Wanik. Submitted June 2023.

2. Department of Energy, Advanced Grid Modeling Research Program, "Developing Adaptive Transmission Resource and Multi-Value Planning Tool Under Profound Uncertainty". $600K. Senior Personnel. Submitted July 2022.

3. UConn Dept. of Civil and Environmental Engineering: "Unleashing the Power Artificial Intelligence toward the Personalization of Teaching Material in Engineering" Arash Esmaili Zaghi and David Wanik (co-I), 30K. Seed grant. 2020.

4. National Science Foundation, Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications ("BD Spokes"), Southern Region: "Building Big Data Capacity and Community for Emergency Management"; $500K. Senior Personnel. Unfunded.
    - Project proposal was endorsed by Duke Energy, Eversource Energy, Oklahoma Gas and Electric and AVANGRID/United Illuminating. 2017.
5. NASA CT Space Grant Consortium: "Towards a Global, Space-Based Power Outage Monitoring Network: Connecticut Leads the Way"; $30K. PI. Unfunded. 2015.
    - Project proposal was endorsed by NASA's Marshall Space Flight Center.

WORK EXPERIENCE

University of Connecticut - Department of Operations and Information Management, Stamford, CT, August 2019 - present. Associate Professor In-Residence.

- Graduate lecturer in statistics, optimization, data science and deep learning as part of the MS in Business Analytics and Project Management (MSBAPM) program.
- Service on MSBAPM Curriculum Committee and search committees.

Hartford Steam Boiler/Munich Re Group - Business Intelligence and Analytics Group, Hartford, CT, November 2017 – August 2019. Senior Modeler.

- Worked on projects related to sensors/IoT, insurance and weather impact modeling.
  - Examples of projects included: energy savings analyses; claims forecasting modeling; insurance pricing models; risk modeling; remote sensing data processing.
- Part-time consultant for HSB from January 2020 – present.

University of Connecticut - Department of Civil & Environmental Engineering, Storrs, CT, August 2011-October 2017. Assistant Research Professor, Center Manager.

- Served as an Assistant Research Professor in the School of Engineering where I co-led storm outage modeling research activities and teach a graduate class on predictive analytics.
- Received >$4M in funding on predictive modeling research for engineering applications, including storm outage modeling and grid resilience.
- Concurrently served as Manager of the Eversource Energy Center (www.eversource.uconn.edu/), a UConn center of excellence where I provided modeling expertise and guidance on 15 funded research projects related to storm outage forecasting, cyber/physical security, electric grid hardening, advancing renewables, LiDAR technologies for 3-D infrastructure, grid resilience improvements, and tree and forest management.

United Technologies Corporation - Corporate EH&S Department, Hartford, CT, November 2012 – June 2013. EH&S Leadership Program Associate.

- Rotational environmental leadership program through UTC commercial, aerospace and corporate divisions.

Northeast Utilities System Company - Environmental and Property Management Department, Berlin, CT 06037, May 2009 – October 2012.

- Water compliance and GIS subject matter expert for the department, and served as a working team lead on distribution transformer lifecycle analysis for the Electric Utility Industry Sustainable Supply Chain Alliance (EUISSCA).

SOFTWARE COMPETENCIES

- Programming Languages: R (expert), Python (expert), PySpark (competent), PyTorch (competent)

HONORS AND AWARDS

- Excellence in Graduate Teaching Award (2024), UConn School of Business.
- Innovation in Teaching Award (2022), UConn School of Business. Carlos Cardonha, Stephen Fitzgerald, and Dave Wanik for the redesign of OPIM 3803 and OPIM 5641 (software change from Excel to Python and Google Colaboratory; teaching Python in core business classes).
- Environmental Leadership Award (2016): Given by University of Connecticut's Environmental Policy Advisory Council, awarded to one graduate student every three years.
- Poster Competition Runner-Up (2015): "Storm Outage Modeling and Estimated Time Until Restoration Modeling" - UConn Engineering Graduate Student Poster Competition; Storrs, CT.
- Poster Competition Winner (2014): "Storm Outage Modeling for an Electric Distribution Network in Northeastern USA" - SAS Predictive Analytics Conference; Las Vegas, NV.
- Eagle Scout (2007) - Boy Scouts of America.

REVIEWER

- Stochastic Environmental Risk Assessment
- Risk Analysis
- IEEE Access
- Remote Sensing
- PLOS One
- Journal of Applied Meteorology and Climatology (2019 – present)
- Sensors

STUDENT ADVISING

Associate MS/PhD Advisor

- Faeze Safari – PhD Candidate – Neag School of Education (current)
- Nyame Sita – PhD Candidate – Environmental Engineering (graduated Fall 2025)
- William Taylor – PhD Candidate – Environmental Engineering (graduated Fall 2023)
- Aaron Spaulding – MS- Environmental Engineering (graduated Spring 2023)
- Kingsley Udeh – PhD Candidate – Computer Science (graduated Fall 2022)
- Christina Feng – PhD Candidate – Environmental Engineering (graduated Summer 2022)
- Peter Watson– PhD Candidate – Environmental Engineering (graduated Fall 2021)
- Feifei Yang – PhD Candidate – Environmental Engineering (graduated Spring 2021)
- Tara Walsh – PhD Candidate – Environmental Engineering (graduated Spring 2020)
- Maryam Pardakhti – PhD Candidate – Chemical Engineering (graduated Spring 2019)
- Diego Cerrai – PhD Candidate – Environmental Engineering (graduated Spring 2019)

Undergraduate Advising

- JiWon Kim – Computer Science and Engineering (started Fall 2022)
  - Bayesian neural networks for probabilistic energy demand forecasting
- Nikolas Anagnostou – Computer Science and Engineering (graduated Spring 2024)
  - Deep generative models for weather 'nowcasting'
- Y'leise Saez – Electrical Engineering (graduated Spring 2023)
  - Served as advisor for Pioneering Diversity Internship at the Eversource Energy Center
  - Analysing the frequency and severity of extreme weather in Connecticut
- Berk Alpay – Computer Science and Engineering (graduated Spring 2020)
  - Barry Goldwater National Scholarship Winner (Spring 2019)
  - Application of deep learning time series models to power outage prediction models

CERTIFICATIONS

- Engineer in Training, Environmental Engineering, State of Connecticut License EIT.11352, Expiration: 2014 – 2024

VOLUNTEER EXPERIENCE

- Fidelco Guide Dog Foundation, Guide Dog Puppy Raiser and Volunteer; 2016 – 2018
  - Fitz (2016, F27 litter), Fern (2018, F28 litter), and Grace (2019, G28 litter).