Victor M. Zavala

Baldovin-DaPra Professor
Department of Chemical and Biological Engineering
University of Wisconsin-Madison
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EDUCATION

Ph.D. in Chemical Engineering (Process Systems Engineering), 2008
Carnegie Mellon University, Pittsburgh, PA, USA

B.Sc. in Chemical Engineering (Honors), 2003
Universidad Iberoamericana, Mexico City

APPOINTMENTS

University of Wisconsin-Madison, Department of Chemical and Biological Engineering
Baldovin-DaPra Professor. August 2021 - Present

Argonne National Laboratory, Mathematics and Computer Science Division
Joint Appointment (Part-Time). September 2025 - Present.

Argonne National Laboratory, Mathematics and Computer Science Division
Senior Computational Mathematician (Part-Time). April 2022 - August 2025.

University of Wisconsin-Madison, Department of Chemical and Biological Engineering
Baldovin-DaPra Associate Professor. August 2018 - August 2021

University of Wisconsin-Madison, Department of Chemical and Biological Engineering
Richard H. Soit Assistant Professor. August 2015 - August 2018

Argonne National Laboratory, Mathematics and Computer Science Division
Computational Mathematician (Part-Time). August 2015- April 2022.

Argonne National Laboratory, Mathematics and Computer Science Division
Computational Mathematician. November 2014 - August 2015

Argonne National Laboratory, Mathematics and Computer Science Division
Assistant Computational Mathematician. October 2010 - October 2014

University of Chicago, Computation Institute
Fellow. December 2011 - August 2015.

Argonne National Laboratory, Mathematics and Computer Science Division
Argonne Scholar. October 2008 -October 2010

ExxonMobil Chemical, Core Engineering and Technology Complex
Research Intern, Process Control. July 2007 - September 2007 and June 2006 - August 2006

Celanese Corporation, Cangrejera Chemical Complex, Mexico
Engineering Intern, Process Engineering. May 2003 - July 2003 and May 2001 - July 2001

HONORS AND AWARDS

- Plenary Speaker, ESCAPE, 2027
- Plenary Speaker, PSE, 2027
- Plenary Speaker, FOCAPO/CPC, 2027
- Senior Member, National Academy of Inventors, 2026.

- Peck Lecture, Illinois Institute of Technology, 2026.
- Culture Champion Award, UW-Madison, 2026.
- Harvey Spangler Award for Innovative Teaching and Learning Practice, UW-Madison, 2024.
- Outstanding Paper Award, Mathematical Programming Computation, 2023.
- Vilas Mid-Career Award, UW-Madison, 2023-2026.
- Mellichamp Lecture, University of California-Santa Barbara, 2023.
- Thiele Lecture, Notre Dame University, 2023.
- Keynote Speaker, LatinX in ChemE, 2023.
- Plenary Speaker, AMIDIQ, 2022.
- H.I. Romnes Faculty Fellowship, UW-Madison, 2022.
- Mellichamp Lecturer, Purdue University, 2021.
- Best Paper Award, Computers and Chemical Engineering, 2020.
- Presidential Early Career Award for Scientists and Engineers (PECASE), 2019.
- AIChE CAST Young Investigator Award, 2019.
- Vilas Associate Fellowship, UW-Madison, 2019.
- American Chemical Society, Class of Influential Researchers, 2018.
- National Academy of Engineering, Frontiers of Engineering, 2018.
- National Science Foundation Early Career Award, 2018-2023.
- Vilas Faculty Early Career Investigator Award, 2016-2018.
- Department of Energy Early Career Award, 2012-2017.
- Invited Keynote Speaker, 9th International Symposium on Advanced Control of Chemical Processes, 2015.
- Best Paper Award, 5th Workshop on Scientific Cloud Computing (ScienceCloud), 2014.
- Director's Postdoctoral Fellowship at Argonne National Laboratory, 2008-2010.
- Humboldt Fellowship, Humboldt Foundation, 2008-2010 (Not Realized).
- Best Paper Award, IEEE Workshop on Advanced Process Control Applications for Industry, 2007.
- Invited Keynote Speaker, International Workshop on Assessment and Future Directions of Nonlinear Model Predictive Control, 2008.
- Invited Keynote Speaker, 8th International Symposium on Dynamics and Control of Process Systems. Cancun, Mexico. 2007.

CURRENT RESEARCH FUNDING

- co-PI, *Economically Optimal Process Decision Making using Machine Learning Models*, BioMADE / DoD-USAF, $250,000 Total ($117K Allocation to co-PI), 2026-2027. Place of Performance: UW-Madison.
- co-PI, *Building Plant Chemical Platforms for Efficient Aromatic Production Directly from CO_2*, DOE-ARPA-E, $2,882,692 Total ($105K Allocation to co-PI), 2026-2029. Place of Performance: UW-Madison.
- co-PI, *BioMADE: Economically Optimal Process Decision Making using Machine Learning Models*, National Science Foundation, $500,000 Total ($224K Allocation to co-PI), 2025-2027. Place of Performance: UW-Madison.

- co-PI, *Exploiting the Unseen to Identify the Unknown: Machine Learning-Assisted Platforms for the Detection of Toxic 'Forever Chemicals' (PFAS) in Water*, Wisconsin Alumni Research Foundation, $493,096 Total ($76K Allocation to co-PI), 2025-2027. Place of Performance: UW-Madison.
- co-PI, *Solvent Targeted Recovery and Precipitation (STRAP) for Recovery of Biogenic Materials and Plastics from Municipal Solid Waste (MSW)*, DOE-EERE (via Michigan Technological University), $750,000 Total ($242K Allocation to co-PI), 2025-2027. Place of Performance: UW-Madison.
- co-PI, *CDS&E: Accelerating the Computational Design of Nanoparticle-Protein Interactions via Molecular Simulations, Topological Data Analysis, and Machine Learning*, National Science Foundation, $510,959 Total ($163K Allocation to co-PI), 2024-2027. Place of Performance: UW-Madison.
- co-PI, *UPR-UW PREM: Center for Advancing Research and Training for STEM Success*, National Science Foundation, $4,200,000 Total ($43K Allocation to co-PI), 2024-2030. Place of Performance: UW-Madison.
- co-PI, *Converting Inconsistent and Heterogenous Biomass and Municipal Solid Wastes into De-Mineralized, and Uniform Feedstocks for Thermal-Catalytic Processing to Low Carbon Fuels, Chemicals, and Materials*, Foundation for Food & Agriculture Research / Schmidt Sciences, $9,957,000 Total ($710K Allocation to co-PI), 2024-2029. Place of Performance: UW-Madison.
- co-I, *Wisconsin Materials Research Science and Engineering Center (MRSEC)*, National Science Foundation, $18,000,000 Total ($140K Allocation to co-I), 2023-2029. Place of Performance: UW-Madison.
- PI, *FMRG: Cyber: Manufacturing USA: Exploiting Spatio-Temporal Interdependencies Between Electrochemical Manufacturing and the Power Grid to Optimize Flexibility, Economics, and Sustainability*, National Science Foundation, $2,999,466 Total ($400K Allocation to co-PI), 2023-2027. Place of Performance: UW-Madison.

PAST RESEARCH FUNDING

- co-Director, *Sloan Center for Systemic Change*, Alfred P. Sloan Foundation, $249,912 Total ($33K Allocation to co-Director), 2024-2026. Place of Performance: UW-Madison.
- PI, *New and Scalable Paradigms for Data-Driven Model Predictive Control*, National Science Foundation, $344,126, 2023-2026. Place of Performance: UW-Madison.
- co-PI, *New Abstractions and Randomized Algorithms for Multiscale Stochastic Optimization*, DOE-Office of Science, $500,000 Total ($250K Allocation to co-PI), 2022-2026. Place of Performance: Argonne.
- PI, *EFRI DCheM: Distributed Photosynthetic Recovery of Livestock Waste Nutrients for Sustainable Production of Fertilizers*, National Science Foundation, $2,000,000 Total ($350K Allocation to co-PI), 2021-2026. Place of Performance: UW-Madison.
- co-PI, *Multi-University Center on Chemical Upcycling of Waste Plastics*, DOE-EERE, $10,000,000 Total ($300K Allocation to co-PI), 2021-2025. Place of Performance: UW-Madison.
- PI, *Accelerating the Discovery of Electrolyte Systems for Safe and Sustainable Energy Storage*, UW-Madison (Research Forward), $499,000 Total ($100K Allocation to co-PI), 2023-2025. Place of Performance: UW-Madison.
- co-PI, *Designing Recyclable, Biomass-based Polyesters*, DOE-EERE, $2,500,000 Total ($350K Allocation to co-PI), 2021-2024. Place of Performance: UW-Madison.
- co-PI, *Assessing and Engineering Microbes for Bioproduction in Conditions of Variable Radiation*, DARPA, $163,886 Total, 2023-2025. Place of Performance: UW-Madison.
- co-PI, *Graph-Indexed Optimization*, DOE-Office of Science, $1,670,000 Total ($300K Allocation to co-PI), 2021-2024. Place of Performance: Argonne.
- PI, *Systems Approaches and Strategies for Integrated Nutrient Management, Minimizing Nutrient Pollution and Harmful Algal Blooms*, U.S. EPA, $250,000 Total, 2020-2023. Place of Performance: UW-Madison.
- PI, *CAREER: Optimization Formulations and Algorithms for the Analysis and Design of Hierarchical Modular Systems*, National Science Foundation, $ 502,000 Total, 2018-2023. Place of Performance: UW-Madison.

- co-PI, *MACSER: Multifaceted Mathematics for Rare, High Impact Events in Complex Energy and Environment Systems*, Department of Energy, Office of Science, $3,818,507 Total ($400K Allocation to co-PI), 2018-2023. Place of Performance: UW-Madison.
- PI, *BIGDATA: IA: Collaborative Research: Data-Driven, Multi-Scale Design of Liquid-Crystals for Wearable Sensors for Monitoring Human Exposure and Air Quality*, National Science Foundation, $1,899,995 Total ($350K Allocation to co-PI), 2018-2023. Place of Performance: UW-Madison.
- Senior Personnel, *REU Site: The Chemistry of Materials and Renewable Energy*, NSF, $336,000 Total ($10K Allocation to co-PI), 2020-2023. Place of Performance: UW-Madison.
- co-PI, *Scalable Algorithms for Space-Time Indexed Optimization of Complex Systems*, DOE Office of Science, $1,320,000 Total ($300K Allocation to co-PI), 2018-2021.
- PI, *A Platform for Scientific Application, Dissemination and Community Engagement*, ParallelWorks, Inc., $100,000, 2020-2022.
- PI, *CRISP 2.0 Type 2: Collaborative Research: Exploiting Interdependencies Between Computing and Electrical Power Infrastructures to Maximize Resilience and Flexibility*, National Science Foundation, $1,791,000 Total ($300K Allocation to co-PI), 2018-2022.
- PI, *A Multi-Scale Platform for Technology Evaluation and Decision-Making in the Dairy-Water-Energy Nexus*, U.S. Department of Agriculture, $2.4M Total ($450K allocation to PI), 2016-2021.
- PI, *Multi-Stakeholder Decision-Making for the Development of Livestock Waste-to-Biogas Systems*, National Science Foundation-CBET, ($300K Total), 2016-2018.
- PI, *Multi-Scale Predictive Control of Coupled Energy Networks*, National Science Foundation-EECS, ($328K Total), 2016-2018.
- PI, *Machine Learning Algorithms for High-Throughput Materials Data*, UW-Madison MRSEC, $ 69,000 Total, 2019.
- PI, *High-Throughput Chemical Sensing Using Liquid Crystals and Scalable Machine Learning Algorithms*, UW-Madison MRSEC, $ 70,000 Total, 2018.
- PI, *Supply Chain Design for Material-to-Energy Systems*, U.S. Environmental Protection Agency, $ 112,000 Total, 2018.
- PI, *Next-Generation Optimization under Uncertainty: Structure-Oriented Algorithms*, Department of Energy, Office of Science Early Career Award, $150K/yr ($300K Total), 2016-2017.
- PI, *Incentive-Based Demand Response of Battery Systems*, Johnson Controls, $150K, 2016-2018
- PI, *Constrained Optimization for Wind Power Production*, General Electric Company, $75K, 2016.
- co-PI, *The Multifaceted Mathematics Center for Complex Energy Systems*, Department of Energy, Office of Science, $3,966,460 Total ($140K Allocation to co-PI), 2016-2017.
- PI, *Next-Generation Optimization under Uncertainty: Structure-Oriented Algorithms*, Department of Energy, Office of Science Early Career Award, $500K/yr ($1.5M Total), 2012-2015
- PI, *Development of Methodologies for Large-scale Optimization for Electrical Transmission Planning*, DOE-AOP, Office of Electricity, $300K/yr, 2010-2015
- co-PI, *Novel Power System Operations Methods for Wind-Powered Systems*, LDRD Award, Argonne National Laboratory, $350K, 2009-2012
- co-PI, *Building-Wide, Proactive Energy Management Systems for High-Performance Buildings*, DOE-AOP, EERE, $300K, 2010-2012
- PI, *Nonlinear MPC Assessment for Energy Applications*, General Electric Company, $50K, 2010

JOURNAL PUBLICATIONS

[1] J. C. Flory, A. Mukherjee, P. J. Dauenhauer, and **V.M. Zavala**. Computing optimal programs for programmable catalysts using bayesian optimization. *Computers and Chemical Engineering*, 216:109919, 2027. [doi] [preprint].

[2] A. Mukherjee, T. A. Soderstrom, M. J. Kurtz, and **V.M. Zavala**. Topological data analysis for high-dimensional dynamic process monitoring. *Computers and Chemical Engineering*, 216:109883, 2027. [doi] [preprint].

[3] M. Baldea, L. J. Broadbelt, M. G. Ierapetritou, A. Jain, A. Kumar, T. A. Kwan, F. Llovell, A. J. Medford, I. Mitrai, J. A. Paulson, and **V.M. Zavala**. Atoms to processes: the role of artificial intelligence and machine learning in chemical engineering. *Industrial and Engineering Chemistry Research*, 2026. [doi] [preprint].

[4] E. Canales, A. Ayala-Cortés, L. Santiago-Martínez, O. S. Okwundu, D. Butler, **V.M. Zavala**, and G. W. Huber. Fractionation of wheat middlings into starch, proteins, and lignocellulosic residues. *ACS Sustainable Chemistry and Engineering*, 14(43):19840–19853, 2026. [doi].

[5] D. L. Cole, F. Pecci, O. J. Guerra, H. Gangammanavar, J. D. Jenkins, and **V.M. Zavala**. Graph-based modeling and decomposition of hierarchical optimization problems. *Mathematical Programming Computation*, 18(4):1079–1131, 2026. [doi] [preprint].

[6] Y. R. Cortes-Pena and **V.M. Zavala**. Phenomena-based graph representations and applications to chemical process simulation. *Computers and Chemical Engineering*:109756, 2026. [doi] [preprint].

[7] P. Dubey, Y. R. Cortes-Pena, M. Alvear, Z. Alikhani, I. Hermans, **V.M. Zavala**, and M. M. Wright. Data-driven approaches to understand the economic and environmental impacts of fluid catalytic cracking catalyst performance for plastic upcycling. *ACS Sustainable Chemistry and Engineering*, 14(17):8244–8258, 2026. [doi].

[8] G. Hernandez-Morales, B. Cansino-Loeza, A. Jimenez-Gutierrez, and **V.M. Zavala**. Simulation-based optimization over discrete spaces using projection to continuous latent spaces. *Industrial and Engineering Chemistry Research*, 2026. [doi] [preprint].

[9] U. M. Ikegwu, R. C. Van Lehn, and **V.M. Zavala**. Navigating large chemical spaces using graph theory and integer programming. *Journal of Chemical Information and Modeling*, 2026. [doi] [preprint].

[10] J. Kim, P.-Y. Yen, A. M. Bradley, R. N. Gaines, P. J. A. Kenis, and **V.M. Zavala**. Achieving flexible operation by aggregating structured operating protocols: an electrolysis case study using real market data. *Industrial and Engineering Chemistry Research*, 65(40):21675–21696, 2026. [doi] [preprint].

[11] M. Li, R. Wang, P.-Y. Yen, A. Moeller, R. Shippy, K. H. Michael, **V.M. Zavala**, S. Jin, and M. Mavrikakis. Trends for proton transport activity and stability in turnbull's blue analogues: theory and experiments. *Chemistry of Materials*, 38(12):5903–5915, 2026. [doi].

[12] B. C. Loeza, V. McIntosh, K. Ternus, M. Bansal, D. Laky, L. Roberson, H. Alper, and **V.M. Zavala**. Space biomanufacturing of lactic acid: conceptual design and techno-economic analysis. *Computers and Chemical Engineering*, 2026. [doi] [preprint].

[13] A. Mukherjee and **V.M. Zavala**. Physics-constrained machine learning for chemical engineering. *Current Opinion in Chemical Engineering*, 51:101228, 2026. [doi] [preprint].

[14] L. Santiago-Martinez, S. Avraamidou, A. Ayala-Cortes, R. Azike, S. Bakshi, C. Banik, E. Bar-Ziv, E. Canales, T. Carlson, J. A. Dumesic, **V.M. Zavala**, et al. Biomass demineralization: a critical need for future biorefineries. *Chemical Reviews*, 126(8):4511–4591, 2026. [doi].

[15] J. Thompson, B. M. Connors, **V.M. Zavala**, and O. S. Venturelli. Physics-constrained neural ordinary differential equation models to discover and predict microbial community dynamics. *Proceedings of the National Academy of Sciences*, 123(13):e2517661123, 2026. [doi] [preprint].

[16] J. Umana, N. Zawicki, M. A. Gebbie, **V.M. Zavala**, and R. K. Cersonsky. Identifying the impact of chemical functional groups on ionic liquid conductivity. *Chemical Science*, 17(27):13642–13655, 2026. [doi] [preprint].

[17] R. Wang, K. Michael, P. J. Kenis, **V.M. Zavala**, and S. Jin. Modular electrochemical synthesis for flexible chemical manufacturing. *Nature Chemical Engineering*, 3(3):142–146, 2026. [doi].

[18] P. Zhou, U. M. Ikegwu, E. Radkevich, E. Ra, H. Liburd, G. W. Huber, **V.M. Zavala**, and R. C. Van Lehn. Solvent-mediated contaminant removal from plastic waste using thermodynamic modeling. *Green Chemistry*, 28(21):9061–9077, 2026. [doi].

[19] B. E. Zuniga, J. P. Abraham, J. Jaroensuk, B. Cansino-Loeza, C. M. Hasenour, S. Weidenbach, R. B. Williams, **V.M. Zavala**, D. K. Allen, B. F. Pfleger, et al. Rational engineering to enhance c8-fatty acid biosynthesis in picosynechococcus sp. pcc 7002. *Metabolic Engineering*, 2026. [doi].

[20] M. Baldea, L. J. Broadbelt, M. G. Ierapetritou, T. A. Kwan, C. Li, Z.-H. Luo, X. Ma, M. Morbidelli, K. C. Sahu, A. M. Scurto, Z. P. Smith, H. Wang, F.-S. Xiao, **V.M. Zavala**, and D. Zhao. 2024 in retrospective: trends in chemical engineering. *Industrial and Engineering Chemistry Research*, 64(24):11615–11623, 2025. [doi].

[21] M. Baldea, A. T. Georgiou, B. Gopaluni, M. Mercangöz, C. C. Pantelides, K. Sheth, **V.M. Zavala**, and C. Georgakis. From automated to autonomous process operations. *Computers and Chemical Engineering*, 196:109064, 2025. [doi].

[22] P. Brahmbhatt, D. L. Cole, **V.M. Zavala**, and S. Avraamidou. Benders decomposition using graph modeling and multi-parametric programming. *Industrial and Engineering Chemistry Research*, 2025. [doi] [preprint].

[23] T. A. Chavkin, L. D. Gonzalez, B. Cansino-Loeza, R. A. Larson, B. F. Pfleger, and **V.M. Zavala**. Codesign of cyanobacteria mutant strains and processes for phosphorus recovery from livestock wastewater. *ACS Sustainable Chemistry and Engineering*, 13(7):2672–2682, 2025. [doi] [preprint].

[24] D. L. Cole, S. Dalvi, **V.M. Zavala**, and O. J. Guerra. Toward understanding the complexity of long-duration energy storage siting in high renewable power grids. *iScience*, 28(6), 2025. [doi].

[25] A. Engelmann, S. Shin, F. Pacaud, and **V.M. Zavala**. Scalable primal decomposition schemes for large-scale infrastructure networks. *IEEE Transactions on Control of Network Systems*, 2025. [doi] [preprint].

[26] R. C. Garcia, E. D. Erickson, M. Martin, and **V.M. Zavala**. Evaluating the potential of plastic waste upcycling using thermochemical technologies: a case study in spain. *Computers and Chemical Engineering*:109524, 2025. [doi].

[27] L. D. Gonzalez and **V.M. Zavala**. Implementation of a bayesian optimization framework for interconnected systems. *Industrial and Engineering Chemistry Research*, 2025. [doi] [preprint].

[28] L. D. Gonzalez, B. Cansino-Loeza, T. A. Chavkin, J. D. Gay, R. A. Larson, B. F. Pfleger, and **V.M. Zavala**. Techno-economic analysis of an integrated process for cyanobacteria-based nutrient recovery from livestock waste. *Computers and Chemical Engineering*:109149, 2025. [doi] [preprint].

[29] L. D. Gonzalez, J. L. Pulsipher, S. Jiang, A. Mukherjee, T. Soderstrom, and **V.M. Zavala**. A digital twin simulator of a pastillation process with applications to automatic control based on computer vision. *Computers and Chemical Engineering*, 201:109205, 2025. [doi] [preprint].

[30] J. E. Gonzalez-Perez, S. Jiang, O. Jimenez-Gonzalez, **V.M. Zavala**, A. Romo-Hernandez, J. A. Guerrero-Beltran, A. Lopez-Malo, and N. Ramirez-Corona. Implementing topological data analysis for monitoring mass transfer during vacuum-assisted osmotic dehydration of apples. *ACS omega*, 2025. [doi].

[31] U. M. Ikegwu, A. del Carmen Munguia-Lopez, **V.M. Zavala**, and R. C. Van Lehn. Screening green solvents for multilayer plastic film recycling processes. *Computers and Chemical Engineering*:109129, 2025. [doi] [preprint].

[32] U. M. Ikegwu, P. Zhou, R. C. Van Lehn, **V.M. Zavala**, and A. del Carmen Munguia-Lopez. A fast computational framework for the design of solvent-based plastic recycling processes. *Computers and Chemical Engineering*:109148, 2025. [doi] [preprint].

[33] L. A. Knose, D. L. Cole, E. Martin-Hernandez, **V.M. Zavala**, M. A. Gonzalez, C. Vaneeckhaute, and G. J. Ruiz-Mercado. The impact of legacy nutrient loading from lake sediments on cyanobacteria bloom severity. *ACS EST Water*, 2025. [doi].

[34] B. Lopez, Y. Shao, and **V.M. Zavala**. A graph-theoretic framework for analyzing and designing chemical engineering curricula. *Computers and Chemical Engineering*:109150, 2025. [doi] [preprint].

[35] S. A. Medina-Moreno, **V.M. Zavala**, E. Gaxiola-Muniz, A. M. Juvera-Gutierrez, and E. N. Tec-Caamal. Performance drivers for diesel degradation in multiphase bioreactors by microbial consortia isolated from polluted environments. *Industrial and Engineering Chemistry Research*, 64(12):6279–6291, 2025. [doi].

[36] P. M. Perkovich, Y. R. Cortes-Pena, J. J. Baerwald, T. H. Graupmann, T. A. Chavkin, S. Mishra, W. T. Cordell, **V.M. Zavala**, and B. F. Pfleger. Demonstration and technoeconomic analysis of dodecanol production from acetate using metabolically engineered escherichia coli. *Metabolic Engineering*, 2025. [doi].

[37] A. Posada-Borbon, T. Wolter, H. Yu, E. Smith, J. J. Schauer, R. C. Van Lehn, **V.M. Zavala**, N. L. Abbott, and M. Mavrikakis. No2 adsorption on oxygen-modified ag at ambient conditions. *Journal of the American Chemical Society*, 2025. [doi].

[38] I. Riepin, T. Brown, and **V.M. Zavala**. Spatio-temporal load shifting for truly clean computing. *Advances in Applied Energy*, 17:100202, 2025. [doi] [preprint].

[39] W. D. Seider, S. Bhamla, J. Dunn, M. El-Halwagi, T. Hanrath, M. F. Hasan, J. Hedengren, L. Hirshfield, C. T. Maravelias, M. Piffarerio, **V.M. Zavala**, et al. Teaching chemical product design. *Education for Chemical Engineers*, 52:101–110, 2025. [doi].

[40] P. A. Tominac, **V.M. Zavala**, M. A. Zamarripa, and M. G. Drouven. New opportunities in produced water management: a market-based approach to produced water trading. *Geoenergy Science and Engineering*, 244:213393, 2025. [doi].

[41] J. Umana, R. K. Cashen, **V.M. Zavala**, and M. A. Gebbie. Uncovering ion transport mechanisms in ionic liquids using data science. *Digital Discovery*, 4(6):1423–1436, 2025. [doi] [preprint].

[42] F. Wang, S. Qin, Z. Yang, L. M. Edwards-Medina, B. L. Chiu, C. Acevedo-Velez, C. K. Remucal, R. C. Van Lehn, **V.M. Zavala**, and D. M. Lynn. A machine learning-assisted liquid crystal droplet array platform for the sensitive and selective detection of per-and polyfluoroalkyl substances (pfas) in water. *ACS sensors*, 10(10):7343–7353, 2025. [doi].

[43] B.-X. Wang and V. M. Zavala. A fairness-guided supply chain framework for polyester production from biomass. *Computers and Chemical Engineering*:109504, 2025. [doi].

[44] Z. Xu, K. Sanchez-Rivera, C. Granger, P. Zhou, A. d. C. Munguia-Lopez, U. M. Ikegwu, S. Avraamidou, **V.M. Zavala**, R. C. Van Lehn, E. Bar-Ziv, et al. Solvent-based plastic recycling technologies. *Nature Chemical Engineering*, 2(7):407–423, 2025. [doi].

[45] **V.M. Zavala** and A. D. Smith. The shape of complex systems. *Nature Chemical Engineering*, 1(7):494–494, 2024. [doi].

[46] V. Blanco, Y. Hinojosa, and **V.M. Zavala**. The waste-to-biomethane logistic problem: a mathematical optimization approach. *ACS Sustainable Chemistry and Engineering*, 2024. [doi] [preprint].

[47] D. L. Cole and **V.M. Zavala**. Plasmodata.jl — a julia framework for modeling and analyzing complex data as graphs. *Computers and Chemical Engineering*, 185:108679, 2024. [doi] [preprint].

[48] E. D. Erickson, P. A. Tominac, J. Ma, H. Aguirre-Villegas, and **V.M. Zavala**. Evaluating the economic and environmental benefits of deploying a national-scale, thermo-chemical plastic waste upcycling infrastructure in the united states. *Computers and Chemical Engineering*, 189:108800, 2024. [doi] [preprint].

[49] Z. P. Harmer, J. C. Thompson, D. L. Cole, O. S. Venturelli, **V.M. Zavala**, and M. N. McClean. Dynamic multiplexed control and modeling of optogenetic systems using the high-throughput optogenetic platform, lustro. *ACS Synthetic Biology*, 13(5):1424–1433, 2024. [doi] [preprint].

[50] S. Jiang, S. Qin, R. C. Van Lehn, P. Balaprakash, and **V.M. Zavala**. Uncertainty quantification for molecular property predictions with graph neural architecture search. *Digital Discovery*, 3(8):1534–1553, 2024. [doi] [preprint].

[51] D. J. Laky and **V.M. Zavala**. A fast and scalable computational topology framework for the euler characteristic. *Digital Discovery*, 3(2):392–409, 2024. [doi] [preprint].

[52] F. Long, S. Jiang, E. Bar-Ziv, and **V.M. Zavala**. Robust plastic waste classification using wavelet transform multi-resolution analysis and convolutional neural networks. *Computers and Chemical Engineering*, 181:108516, 2024. [doi].

[53] B. Lopez, J. Ma, and **V.M. Zavala**. Graph-based optimization for technology pathway analysis: a case study in the decarbonization of university campuses. *Industrial and Engineering Chemistry Research*, 63(5):2276–2293, 2024. [doi] [preprint].

[54] C. Lucky, S. Jiang, C.-R. Shih, **V.M. Zavala**, and M. Schreier. Understanding the interplay between electrocatalytic fragmentation and oxygenation reactions. *Nature Catalysis*:1–11, 2024. [doi].

[55] G. H. Morales, E. I. S. Medina, A. Jimenez-Gutierrez, and **V.M. Zavala**. Graph neural networks for co2 solubility predictions in deep eutectic solvents. *Computers and Chemical Engineering*:108750, 2024. [doi] [preprint].

[56] S. Qin, S. Omolabake, A. Diaby, J. Li, L. D. Gonzalez, C. M. Holland, **V.M. Zavala**, S. S. Stahl, and R. C. Van Lehn. Identifying green solvent mixtures for bioproduct separation using bayesian experimental design. *ACS Sustainable Chemistry and Engineering*, 12(52):18634–18647, 2024. [doi] [preprint].

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[67] A. Alessandri, M. Baglietto, G. Battistelli, and **V.M. Zavala**. Computationally efficient, approximate moving horizon state estimation for nonlinear systems. In *Proceedings of NOLCOS*, 2010. [doi].

[68] **V.M. Zavala**, M. Anitescu, and T. Krause. On the optimal on-line management of photovoltaic-hydrogen hybrid energy systems. *Computer Aided Chemical Engineering*, 27:1953–1958, 2009. [doi].

[69] **V.M. Zavala** and L. T. Biegler. The advanced step nmpc controller. In *Proceedings of the IEEE Workshop on Advanced Process Control Applications for Industry, Vancouver, Canada*. IEEE, 2007.

[70] **V.M. Zavala**, C. D. Laird, and L. T. Biegler. A fast computational framework for large-scale moving horizon estimation. In *Proceedings of 8th International Symposium on Dynamics and Control of Process Systems, Cancun, Mexico*, 2007. [doi].

[71] **V.M. Zavala**, C. D. Laird, and L. T. Biegler. Fast solvers and rigorous models: can both be accommodated in nmpc. In *IFAC Workshop on Nonlinear Model Predictive Control for Fast Systems*, 2006.

BOOKS AND BOOK CHAPTERS

[1] **V.M. Zavala**. *Statistics for Chemical Engineers: From Data to Models to Decisions*. Cambridge University Press, 2025.

[2] J. L. Pulsipher, D. L. Cole, J. Jalving, and **V.M. Zavala**. Optimization in chemical and biological engineering using julia. In *Introduction to Software for Chemical Engineers*. CRC Press, 2nd edition, 2025. [doi].

[3] S. Jiang, S. Qin, J. L. Pulsipher, and **V.M. Zavala**. Convolutional neural networks: basic concepts and applications in manufacturing. In *Artificial Intelligence in Manufacturing*, pages 63–102. Elsevier, 2024. [doi] [preprint].

[4] E. Martín-Hernández, A. M. Sampat, M. Martín, **V.M. Zavala**, and G. J. Ruiz-Mercado. A logistics analysis for advancing carbon and nutrient recovery from organic waste. In *Advances in Carbon Management Technologies*, pages 186–207. CRC Press, 2020. [doi].

[5] J. Jalving and **V.M. Zavala**. Optimization in chemical and biological engineering using julia. In *Introduction to Software for Chemical Engineers*, pages 713–730. CRC Press, 2019. [doi].

[6] S. Shin and **V.M. Zavala**. Multi-grid schemes for multi-scale coordination of energy systems. In *Energy Markets and Responsive Grids*, pages 195–222. Springer, 2018. [doi] [preprint].

[7] **V.M. Zavala**. Managing conflicts among decision makers in multiobjective design and operations. In *Sustainability in the design, synthesis and analysis of chemical engineering processes*, pages 169–180. Elsevier, 2016. [doi].

[8] N.-Y. Chiang and **V.M. Zavala**. Emerging optimal control models and solvers for interconnected natural gas and electricity networks. In *Alternative Energy Sources and Technologies*, pages 89–115. Springer, 2016. [doi].

[9] K. Kim and **V.M. Zavala**. Large-scale stochastic mixed-integer programming algorithms for power generation scheduling. In *Alternative Energy Sources and Technologies*, pages 493–512. Springer, 2016. [doi].

[10] **V.M. Zavala** and L. T. Biegler. Nonlinear programming strategies for state estimation and model predictive control. In *Nonlinear model predictive control*, pages 419–432. Springer, 2009. [doi].

TECHNICAL REPORTS

[1] D. L. Cole, H. Gangammanavar, and **V.M. Zavala**. Hierarchical Graph Modeling for Multi-Scale Optimization of Power Systems. Technical report, arXiv preprint arXiv:2309.10568, 2023. [doi].

[2] S. Shin, Q. Lu, and **V.M. Zavala**. Unifying Theorems for Subspace Identification and Dynamic Mode Decomposition. Technical report, arXiv preprint arXiv:2003.07410, 2020. [doi].

[3] Y. Cao and **V.M. Zavala**. A Sigmoidal Approximation for Chance-Constrained Nonlinear Programs. Technical report, arXiv preprint arXiv:2004.02402, 2018. [doi].

[4] S. Shin and **V.M. Zavala**. Computing Economic-Optimal and Stable Equilibria for Droop-Controlled Microgrids. Technical report, arXiv preprint arXiv:2002.09802, 2018. [doi].

[5] R. Larson, M. Sharara, L. Good, P. Porter, **V.M. Zavala**, A. Sampat, and A. Smith. Evaluation of Manure Storage Capital Projects in the Yahara River Watershed. Technical report, Technical Report for Dane County, WI, 2016.

THESES (SUPERVISED)

[1] D. Cole. *Graph-Based Modeling for Chemical Engineering Applications*. PhD thesis, University of Wisconsin–Madison, 2025. [thesis].

[2] B. Lopez. *Systems Engineering Approaches for Chemical Engineering Education*. PhD thesis, University of Wisconsin–Madison, 2025. [thesis].

[3] J. Thompson. *Modeling and Optimization of Synthetic Microbial Communities*. PhD thesis, University of Wisconsin–Madison, 2025.

[4] B.-X. Wang. *Systems Analysis Tools for Sustainable Plastics Manufacturing*. PhD thesis, University of Wisconsin–Madison, 2025. [thesis].

[5] L. Gonzalez. *New Paradigms for Bayesian Optimization: Harnessing Physics & High-Throughput Experiments*. PhD thesis, University of Wisconsin–Madison, 2024. [thesis].

[6] J. Ma. *Scalable Decision-Making Frameworks for Sustainability*. PhD thesis, University of Wisconsin–Madison, 2024. [thesis].

[7] A. Qin. *Machine Learning Methods for Chemical Property Prediction, Sensing, and Design*. PhD thesis, University of Wisconsin–Madison, 2024. [thesis].

[8] S. Jiang. *Data Representations and Transformations in Chemical Engineering*. PhD thesis, University of Wisconsin–Madison, 2023. [thesis].

[9] W. Zhang. *Quantifying and Remunerating Flexibility in Energy Systems*. PhD thesis, University of Wisconsin–Madison, 2023. [thesis].

[10] D. Goreke. *Sustainable Plastic Waste Management: Perspectives of Supply Chain Optimization and Life Cycle Analysis*. Master's thesis, University of Wisconsin–Madison, 2022. [thesis].

[11] B. Lopez. *Optimization Framework for the Analysis of Decarbonization Pathways*. Master's thesis, University of Wisconsin–Madison, 2022.

[12] J. Pulsipher. *Infinite-Dimensional Optimization: Modeling Abstractions and Software*. PhD thesis, University of Wisconsin–Madison, 2022. [thesis].

[13] Y. Shao. *Analysis and Design Using Modularity Concepts in Chemical Processes and Supply Chains*. PhD thesis, University of Wisconsin–Madison, 2022. [thesis].

[14] A. Smith. *Data Analysis Via Topology and Geometry with Applications to Chemical Engineering*. PhD thesis, University of Wisconsin–Madison, 2022. [thesis].

[15] Y. Hu. *Computational Frameworks for Sustainable Organic Waste Management*. PhD thesis, University of Wisconsin–Madison, 2021. [thesis].

[16] S. Shin. *Graph-Structured Nonlinear Programming: Properties and Algorithms*. PhD thesis, University of Wisconsin–Madison, 2021. [thesis].

[17] J. Jalving. *Graph-Based Modeling and Simulation of Cyber-Physical Systems*. PhD thesis, University of Wisconsin–Madison, 2020. [thesis].

[18] R. Kumar. *Multiscale Control of Energy Systems*. PhD thesis, University of Wisconsin–Madison, 2020. [thesis].

[19] A. Sampat. *Optimization Formulations for Multi-Product Networks*. PhD thesis, University of Wisconsin–Madison, 2020. [thesis].

PATENTS, TECHNOLOGY TRANSFER, AND INDUSTRY COLLABORATIONS

- **Patents**
  - Abbott, N.L., Cao, Y., **Zavala, V.M.**, and Yu, H. *Methods, Systems, and Media for Detecting the Presence of an Analyte*. U.S. Patent No. 11,037,032, 2021. Assignee: Wisconsin Alumni Research Foundation.
  - Kumar, R., Wenzel, M.J., Ellis, M.J., ElBsat, M.N., Drees, K.H., and **Zavala, V.M.** *Building Energy System with Stochastic Model Predictive Control*. U.S. Patent No. 10,739,742, 2020. Assignee: Johnson Controls Technology Company.
- **Industry Collaborations**

- AspenTech (AspenTech Academy), 2025-Present
- Archer Daniels Midland (Biomass Fractionation), 2026
- Thermo Fisher Scientific (Waste Upcycling), 2026
- ExxonMobil (Process Monitoring and Digital Twins), 2022-2026
- Parallel Works, Inc. (Scientific Computing Platforms), 2020-2022
- Dow Chemical Company (Control and Data Analytics), 2020-2023
- DNV (Natural Gas Networks), 2020
- Genentech (Pharmaceutical Supply Planning), 2020
- United Technologies Research Center, 2015-2020
- Johnson Controls (Building Energy Systems), 2018-2021
- General Electric Company (Wind Energy Systems), 2018
- BuildingIQ (Building Controls), 2010-2013

RESEARCH MENTORING

- **Postdoctoral (Former Institution-Department)**
  - Jiayang Ren (University of British Columbia), 2026-Present
  - Angan Mukherjee (West Virginia University), 2024-Present
  - Yoel Cortes-Pena (UIUC-Chemical Engineering), 2023-2026
  - Alejandro Ayala (UNAM-Chemical Engineering), 2024-2026
  - Brenda Cansino (Universidad Michoacana-Chemical Engineering), 2023-2026
  - Aurora Munguia-Lopez (Universidad Michoacana-Chemical Engineering), 2022-2024
  - Lloyd MacKinnon (McMaster University-Chemical Engineering), 2023
  - Daniel Laky (Purdue University-Chemical Engineering), 2022-2023
  - Philip Tominac (McMaster-Chemical Engineering), 2018-2022
  - Renke Kuhlmann (University of Bremen-Mathematics), 2019
  - Qiugang Lu (UBC-Chemical Engineering), 2019-2020
  - Yankai Cao (Purdue-Chemical Engineering), 2016-2018
  - Alexander Dowling (Carnegie Mellon-Chemical Engineering), 2015-2017
  - Kibaek Kim (Northwestern-Industrial & Systems Engineering), 2014-2016
  - Nai-Yuan Chiang (Edinburgh-Mathematics), 2013-2015
  - Yeonsook Heo (Georgia Tech-Architecture), 2011-2013 (Co-Advised with Diane Graziano)
- **Doctoral (Former Institution-Department)**
  - Jadiel Lopez Gonzalez (University of Puerto Rico), 2026-Present
  - Manuel Gomez Ochoa (Univ Cartagena), 2025-Present
  - Ethan Deutsch (Ohio State), 2024-Present (Co-Advised with Cersonsky)
  - Kiernan Jennings (UConn), 2024-Present (Co-Advised with Avraamidou)
  - Yicheng Li (Carnegie Mellon), 2024-Present (Co-Advised with Van Lehn)
  - Jukbin Kim (KAIST), 2023-Present
  - Joseph Flory (Ohio State), 2023-Present
  - Ashley McCullough (West Virginia), 2023-Present (Co-Advised with Avraamidou)
  - Ugo Ikegwu (Landmark University), 2022-Present (Co-Advised with Van Lehn)
  - Emmy Umana (University of Kansas), 2021-2026 (Co-Advised with Gebbie)
  - Adam Martin (Brigham Young), 2023-2025
  - Lisa Je (Dartmouth College), 2021-2025 (Co-Advised with Van Lehn)
  - David Cole (BYU), 2020-2025

- Blake Lopez (Oregon State), 2020-2025
- Bo-Xun Wang (National Taiwan University), 2020-2025
- Jaron Thompson (Colorado State), 2020-2025 (Co-Advised with Venturelli)
- Leonardo Gonzalez (Texas A&M), 2019-2024
- Amy Qin (Case Western), 2019-2024 (Co-Advised with Van Lehn)
- Jiaze Ma (China University of Petroleum), 2019-2024
- Weiqi Zhang (UCLA), 2018-2023
- Shengli Jiang (UCSD), 2018-2023
- Alexander Smith (Michigan State), 2017-2022
- Yue Shao (Rice University), 2017-2022
- Joshua Pulsipher (BYU), 2017-2022
- Sungho Shin (Seoul National University), 2016-2021
- Yicheng Hu (Zhejiang University), 2016-2021
- Ranjeet Kumar (IIT-Bombay), 2015-2020
- Apoorva Sampat (Institute of Chemical Technology), 2015-2020
- Jordan Jalving (Colorado State University), 2015-2020

- **Masters (Former Institution-Department)**
  - Dilara Goreke (Bogazici University), 2019-2022.

TEACHING

- **CBE-470 (Process Dynamics and Control):** Spring 2016, Spring 2017, Fall 2018
- **CBE-660 (Intermediate Problems in Chemical Engineering):** Fall 2016, Fall 2024
- **CBE-450 (Process Design):** Fall 2017, Spring 2018, Fall 2021, Spring 2022, Spring 2026
- **CBE-562 (Statistics for Chemical Engineers):** Spring 2019, Fall 2020, Spring 2021, Fall 2023, Spring 2024, Spring 2025

ONLINE EDUCATIONAL RESOURCES

- Statistics for Chemical Engineers: GitBook Companion to the Textbook
  https://zavalab.gitbook.io/statschemebook
- Unsolicited Advice for Young Scientists: Online Handbook for PhD Students, Postdocs and Young Faculty (Jupyter Book)
  https://vzavala.github.io/UnsolicitedAdvice/

SCIENTIFIC COMMUNITY ACTIVITIES

- Member, AspenTech Academy, 2025-Present
- Trustee, Computer Aids for Chemical Engineering (CACHE), 2023-Present
- Associate Editor, Industrial and Engineering Chemistry Research, ACS, 2024-Present
- Technical Editor, Mathematical Programming C, 2015-Present
- Editorial Board, Computers & Chemical Engineering, 2021-Present
- Faculty Director, Graduate Research Scholars (GERS) Program, UW-Madison, 2022-Present
- Co-Director, Texas-Wisconsin-California Control Consortium (AACC), 2015-Present
- Director, Computing and Systems Technology Division, AIChE, 2023-2025
- Director, Wisconsin Center of Systemic Change, 2024-2025

- Executive Committee, Materials Science and Engineering Center (UW-Madison), 2018-2020
- Vice-Chair for Special Sessions, American Control Conference 2024, AACC, 2023-2024
- Organizer, Wisconsin Computing in Engineering Forum, 2019-2022
- Conference Organizer, SIAM Convening on Climate Science, Sustainability, and Clean Energy, 2022
- Conference Organizer, FOCAPO/CPC 2023, 2020-2023
- AICHE Director for Board of American Automatic Control Council, 2020-2022
- LatinXChem Organizer (Chemical Engineering), 2021
- Session Organizer "Julia Packages for the Modeling and Solution of Optimization Problems", INFORMS Annual Meeting, 2021
- Associate Editor, IEEE Transactions on Control Systems and Technology, 2019-2022
- Programming Coordinator, AIChE CAST 10B, 2018-2019
- SIAM Diversity Advisory Committee, 2015-2021
- SIAM-SIAG/Optimization Early Career Prize Committee, 2019
- Technical Advisory Committee, Foundations of Process Analytics and Machine learning, 2019
- Organizing Committee, Nonlinear Model Predictive Control, 2018
- Technical Advisory Committee, Associate Editor, ADCHEM, 2018
- AIChE Midwest Research Conference Programming Committee, 2015-2018
- Department of Energy Advanced Computing Tech Team (ACTT), 2015-2017
- Area Chair, Energy Processes, Advanced Control of Chemical Processes Conference, 2018
- Area Chair, AICHE Computing and Systems Technology Division, 2018-2019
- Session Organizer "Scalable Optimization: Paradigms, Tools, and Applications", SIAM-CSE, 2019.
- Cluster Organizer "Applications in Science and Engineering", ICCOPT, 2016.
- SIAM-SIAG/Optimization Nomination Committee, 2016
- Session Organizer "High-Performance Computing for Stochastic Programming", ICSP, 2016.
- Session Organizer "Optimization of Energy Systems", ISMP, 2015.
- Session Organizer "Stochastic Optimization of Complex Systems", SIAM Conference on Optimization, 2014
- Session Organizer "Emerging Applications of Large-Scale Optimization", INFORMS Annual Meeting, 2013
- Track Organizer "Scientific and Engineering Applications of Optimization", ICCOPT, 2013
- Session Organizer "Modeling, Optimization, and Simulation for Power Grid", SIAM CSE, 2013
- International Programming Committee, Nonlinear Model Predictive Control, 2012
- Session Organizer, "Real-Time Optimization", ISMP, 2012
- Organizer "Mathematics for the Analysis, Simulation, and Optimization of Complex Systems", DOE, 2011

RECENT INVITED TALKS

- **2027** - ESCAPE, PSE, FOCAPO/CPC, New York University, UC Berkeley
- **2026** - University of Michigan-Ann Arbor, Illinois Institute of Technology, Penn State, Universidad Autonoma de San Luis Potosi (Mexico), Universidad Autonoma de Queretaro (Mexico), LatinXChem, Fraunhofer Institute (Germany), Michigan Tech, Saudi Aramco, General Motors

- **2025** - Caltech, PME-University of Chicago, IMSI-University of Chicago, BUAP (Mexico), Susu Foundation (Nigeria), Federal University of Rio de Janeiro (Brazil), Electrochemical Society Meeting, University of Pennsylvania, University of Connecticut, University of Alabama, University of Magdeburg/Max Planck Institute (Germany), Technical Institute of Celaya (Mexico), Universidad Veracruzana (Mexico), Universidad de Valladolid (Spain), Universidad de Salamanca (Spain), North Carolina State University, MIT PSE Seminar.
- **2024** - Princeton University, West Virginia University, Rowan University, FOCAPD, Universidad de San Luis Potosi, Zero Lab at Princeton, NREL, Iowa State University, Carnegie Mellon University, University of Kansas, Dow Chemical, Aspen Technology, American Chemical Society, Chem-E Days (Peru)
- **2023** - Merck, Lawrence Livermore National Lab, ExxonMobil, George Mason University, Pacific Northwest National Lab, Notre Dame (Thiele Lecturer), University of Minnesota, FOPAM, USC, University of Padova (Italy), University of California at Santa Barbara (Mellichamp Lecturer)
- **2022** - Discrete Optimization Seminar, University of Minnesota, AMIDIQ, University of Delaware, Oklahoma State University, City University of Hong Kong, University of Guanajuato, CIMAT, IFAC Seminar Series, Imperial College Control Club
- **2021** - Purdue (Mellichamp Lecturer), University of Houston, Georgia Tech, Ohio State, Wayne State, UCSB, Texas A&M, McMaster (Advanced Control Consortium), SIAM CSE, SIAM Optimization, RWTH Aachen, University of Rochester, Dow Chemical, ExxonMobil, eOptimal (MIT), AIChE Next-Gen Manufacturing, University of Celaya (Mexico), International Conference on Operations Research, RIIAA-International Meeting on Artificial Intelligence and its Application, Technical Institute of Aguascalientes (Mexico).
- **2020** - UT-Austin, ETH, Tufts, Los Alamos, IFAC World Congress, INFORMS Annual Meeting, U Washington, Universidad de Guanajuato (Mexico), Midwest Control Workshop (Canceled COVID-19), Purdue (Canceled COVID-19), Argonne AI Workshop (Canceled COVID-19).
- **2019** - Harvard, FOCAPD, IMT Lucca (Italy), Universidad de las Americas (Mexico), ICERM at Brown University, CACHE 50th Anniversary, Machine Learning in Science and Engineering Workshop at Georgia Tech, IEEE Conference on Decision and Control, Carnegie-Mellon University, International Conference on Stochastic Programming.
- **2018** - NAE Frontiers in Engineering, Machine Learning in Science and Engineering Workshop at CMU, ITESM (Mexico), UANL (Mexico), INFORMS Annual Meeting.
- **2017** - USDA, MIT, USC, Stanford, UCLA, BYU, McMaster, FOCAPO/CPC, SIAM Conference on Optimization, Wisconsin State Legislature, SIAM Annual Meeting, Universidad de Valladolid (Spain), Universidad Nacional (Colombia), Universidad de Antioquia (Colombia).
- **2016** - U.S.-Mexico Workshop on Optimization, Technical University of Denmark, King Abdullah University of Science and Technology, Argonne National Laboratory, International Symposium on Stochastic Programming (ICSP), International Conference on Continuous Optimization (ICCOPT), Institute for Mathematics and its Applications, Universidad Michoacana (Mexico), Pacific Northwest National Laboratory, General Electric Company, Dow Chemical Company, Midwest Microgrid Consortium, ITESM (Mexico)
- **2015** - Johns Hopkins University, Princeton University, SIAM CSE, ADCHEM, University of California-Berkeley, Carnegie-Mellon University, AIChE Annual Meeting, IEEE CDC.
- **2014** - University of Southern California, University of Wisconsin-Madison, INFORMS Optimization Society, Illinois Institute of Technology, SIAM Conference on Optimization, Power Systems Computation Conference, Los Alamos National Laboratory, European Control Conference
- **2013** - AICHE-CAST Plenary, Electronics and Telecommunications Research Institute (Korea), Laboratorio Nacional de Energia e Geologia (Portugal), Queen's University (Canada), Universidad Adolfo Ibañez (Chile), Lawrence Berkeley National Laboratory, SIAM CSE, INFORMS ICS, Purdue University, International Conference on Stochastic Programming (ICSP), International Conference on Continuous Optimization (ICCOPT), DOE Office of Science Advanced Scientific Computing Committee (ASCAC), Institute for Mathematics and its Applications
- **2012** - ABB Corporate Research, Universidad Iberoamericana, International Symposium on Mathematical Programming, INFORMS Annual, Singapore Workshop on Optimization, Texas A&M

SOFTWARE PRODUCTS

- Supply Chain Modeling (CoordinatedSupplyChains.jl)
  https://github.com/zavalab/CoordinatedSupplyChains.jl
- Nonlinear Programming Solver (MadNLP.jl)
  https://github.com/zavalab/MadNLP.jl
- Infinite Dimensional Modeling Framework (InfiniteOpt.jl)
  https://github.com/zavalab/InfiniteOpt.jl
- Graph-Based Optimization Modeling Framework (Plasmo.jl)
  https://github.com/zavalab/Plasmo.jl
- Graph-Based Data Modeling Framework (PlasmoData.jl)
  https://github.com/zavalab/PlasmoData.jl
- Framework for Flexibility Analysis (FlexJuMP.jl)
  https://github.com/zavalab/FlexJuMP.jl
- Decomposition for Structured Programming (DSP)
  https://github.com/Argonne-National-Laboratory/DSP
- Parallel Interior Point Solver (PIPS)
  https://github.com/Argonne-National-Laboratory/PIPS
- Lakeland (K-12 Video Game)
  https://fielddaylab.wisc.edu/play/lakeland
- Bloom (K-12 Video Game)
  https://fielddaylab.wisc.edu
- Advanced Decision-Making and Modeling (ADAM)
  https://doi.org/10.1016/j.compchemeng.2022.107911