Joshua Pulsipher, Ph.D.

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Degrees

2017 – 2022 **Ph.D. in Chemical & Biological Engineering**
University of Wisconsin-Madison (Madison, WI)
Advisor: Prof. Victor M. Zavala
Thesis: Infinite-Dimensional Optimization: Modeling Abstractions and Software

2012 – 2017 **B.Sc. in Chemical Engineering**
Brigham Young University (Provo, UT)
Advisor: Prof. John D. Hedengren
Focus: Process Systems Engineering & UAV-Based Infrastructure Monitoring

Relevant Employment History

Research

2023 – Present **Assistant Professor**
Chemical Engineering, University of Waterloo (Waterloo, ON, Canada)
Areas: Data-Driven Decision-Making, Process Systems, Sustainability, Optimization under Uncertainty

2022 – 2023 **Post-Doctoral Associate**
Chemical Engineering, Carnegie Mellon University (Pittsburgh, PA)
Advisors: Profs. Carl D. Laird and Ignacio E. Grossmann
Areas: Data-Driven Decision-Making, Rare Earth Elements, Disease Control, Process Systems

2017 – 2022 **Graduate Research Assistant**
Chemical & Biological Engineering, University of Wisconsin-Madison (Madison, WI)
Areas: Decision-Making under Uncertainty, Advanced Control, Energy Systems, Data-Science

2020 **Applications Engineering Research Intern**
Differentiating Technologies, ExxonMobil Research & Engineering (Spring, TX)
Developed cognitive computer vision sensing framework (patent pending)

2019 **Research Intern**
Optimization & Control, Pacific Northwest National Laboratory (Richland, WA)
Innovated uncertainty propagation analysis for power grid operation

2013 – 2017 **Undergraduate Research Assistant**
Chemical Engineering, Brigham Young University (Provo, UT)
Co-founded optimal UAV-based infrastructure monitoring research program

Teaching

2019 **Recitation Leader**
Chemical & Biological Engineering, University of Wisconsin-Madison (Madison, WI)
Course: Introduction to Chemical Process Modeling
Instructed 1/3 of main lectures with new programming curriculum; obtained 94% approval rating

2018 **Teaching Assistant**
Chemical & Biological Engineering, University of Wisconsin-Madison (Madison, WI)
Course: Process Dynamics & Control
Helped overhaul the control laboratory structure and curriculum

2013 **Recitation Leader**
Chemistry, Brigham Young University (Provo, UT)
Course: Organic Chemistry 1
Achieved 1st quantile grades among all sections taught

Funding Proposals

2022 – 2023 *Multi-Enterprise REE/CM Network Optimization*, U.S. Department of Energy (subcontracted via KeyLogic Systems, Inc.), **$550K**, Role: Senior Personnel (contributed to writing and scoping of the project proposal)

2016 – 2017 *Optimal UAV-Based Infrastructure Monitoring*, U.S. National Science Foundation, **$14K**, Role: Undergraduate Recipient (scoped and wrote the proposal for funding)

Honors and Awards

- **Travel Award**, Foundations of Computer Aided Process Operations / Chemical Process Control (2023)
- **Plenary Speaker**, Computing & Systems Technology Division Plenary Session of the AICHE Annual Meeting (2022)
- **Undergraduate Research Fellowship**, National Science Foundation (2016)
- **Full Academic Scholarship**, Brigham Young University (2013 – 2017)
- **Academic Scholarship**, Brigham Young University Chemical Engineering Department (2012)
- **Masonic Academic Achievement Scholarship**, Yakima Masonic Lodge (2012)
- **Eagle Scout**, Boy Scouts of America (2012)
- **President's List**, Yakima Valley Community College (2011 – 2012)

Research Publications

Journal Articles

12 Kompalli, S., Ammari, B. L., Meraklı, M., Qian, Y., **Pulsipher**, **J. L.**, Bynum, M., Furman, K. C., and Laird, C. D. (2023). "Computational Performance of Algebraic Modeling Languages with Alternate Solver Interfaces and Advanced Modeling Components". *In Preparation*.

11 Ovalle, D., Abhijnan, A., Laird, C. D., Grossmann, I. E., and **Pulsipher**, **J. L.** (2023). "Event Constrained Programming". *In Preparation*.

10 Ovalle, D., **Pulsipher**, **J. L.**, Ye, Y., Ochoa, M. P., Harshbarger, K., Bury, S., Wassick, J. M., Laird, C. D., and Grossmann, I. E. (2023). "Operation Optimization of Supply Chain Networks Under Disruptions". *In Preparation*.

9 Ammari, B. L., Johnson, E. S., Stinchfield, G., Kim, T., Bynum, M., Hart, W. E., **Pulsipher**, **J. L.**, and Laird, C. D. (Mar. 2023). "Linear Model Decision Trees as Surrogates in Optimization of Engineering Applications". *In Press*.

8 **Pulsipher**, **J. L.**, Coutinho, L. D., Soderstrom, T. A., and Zavala, V. M. (Aug. 2022). "SAFE-OCC: A Novelty Detection Framework for Convolutional Neural Network Sensors and its Application in Process Control". In: *Journal of Process Control* 117, pp. 78–97. URL: https://doi.org/10.1016/j.jprocont.2022.07.006.

7 **Pulsipher**, **J. L.**, Davidson, B. R., and Zavala, V. M. (Aug. 2022). "Random Field Optimization". In: *Computers & Chemical Engineering* 165. URL: https://doi.org/10.1016/j.compchemeng.2022.107854.

6 **Pulsipher**, **J. L.**, Zhang, W., Hongisto, T. J., and Zavala, V. M. (Jan. 2022). "A unifying modeling abstraction for infinite-dimensional optimization". In: *Computers & Chemical Engineering* 156. URL: https://doi.org/10.1016/j.compchemeng.2021.107567.

5. **Pulsipher, J. L.** and Zavala, V. M. (Feb. 2020). "Measuring and optimizing system reliability: a stochastic programming approach". In: *Top* 28.3, pp. 626–645. URL: https://doi.org/10.1007/s11750-020-00550-5.

4. **Pulsipher, J. L.** and Zavala, V. M. (Sept. 2019). "A scalable stochastic programming approach for the design of flexible systems". In: *Computers & Chemical Engineering* 128, pp. 69–76. URL: https://doi.org/10.1016/j.compchemeng.2019.05.033.

3. **Pulsipher, J. L.**, Rios, D., and Zavala, V. M. (July 2019). "A computational framework for quantifying and analyzing system flexibility". In: *Computers & Chemical Engineering* 126, pp. 342–355. URL: https://doi.org/10.1016/j.compchemeng.2019.04.024.

2. **Pulsipher, J. L.** and Zavala, V. M. (Nov. 2018). "A mixed-integer conic programming formulation for computing the flexibility index under multivariate gaussian uncertainty". In: *Computers & Chemical Engineering* 119, pp. 302–308. URL: https://doi.org/10.1016/j.compchemeng.2018.09.005.

1. Martin, R. A., Blackburn, L., **Pulsipher, J. L.**, Franke, K., and Hedengren, J. D. (May 2017). "Potential benefits of combining anomaly detection with view planning for UAV infrastructure modeling". In: *Remote Sensing* 9.5, p. 434. URL: https://doi.org/10.3390/rs9050434.

Dissertations

1. **Pulsipher, J. L.** (Feb. 2022). "Infinite-Dimensional Optimization: Modeling Abstractions and Software". PhD thesis. University of Wisconsin-Madison. URL: https://www.proquest.com/dissertations-theses/infinite-dimensional-optimization-modeling/docview/2626931431/se-2.

Conference Proceedings (Peer Reviewed)

5. Ammari, B. L., Stinchfield, G., Bynum, M., Johnson, E. S., **Pulsipher, J. L.**, Qian, Y., Hart, W. E., and Laird, C. D. (Sept. 2022). "Computational Performance of Piecewise Linear Machine Learning Surrogates Embedded in Optimization Problems". *33rd European Symposium on Computer Aided Process Engineering. In Press*.

4. Ovalle, D., **Pulsipher, J. L.**, Gomez, C., Gomez, J. M., Laird, C. D., Drouven, M., and Grossmann, I. E. (Sept. 2022). "Study of Different Formulations for the Multiperiod Blending Problem Applied to Lithium Recovery from Produced Water". *33rd European Symposium on Computer Aided Process Engineering. In Press*.

3. Ammari, B. L., Merakli, M., Kompalli, S., Qian, Y., **Pulsipher, J. L.**, Bynum, M., Furman, K. C., and Laird, C. D. (July 2022). "Computational Performance of Algebraic Modeling Languages with Alternate Solver Interfaces and Advanced Modeling Components". *Foundations of Computer Aided Process Operations / Chemical Process Control 2023*.

2. **Pulsipher, J. L.**, Ovalle, D., Perez, H. D., Laird, C. D., and Grossmann, I. E. (July 2022). "Characterizing Event Constraints with Generalized Disjunctive Programming". *Foundations of Computer Aided Process Operations / Chemical Process Control 2023*.

1. **Pulsipher, J. L.**, Davidson, B. R., and Zavala, V. M. (2022). "New Measures for Shaping Trajectories in Dynamic Optimization". *13th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems*. Vol. 55. 7. IFAC PapersOnLine, pp. 495–500. URL: https://doi.org/10.1016/j.ifacol.2022.07.492.

Book Chapters

1. Jiang, S., Qin, S., **Pulsipher, J. L.**, and Zavala, V. M. (May 2022). "Convoluational Neural Networks: Basic Concepts and Applications in Manufacturing". *Artificial Intelligence in Manufacturing*. Ed. by M. Soroush and R. Braatz. *In Press*. URL: https://doi.org/10.48550/arXiv.2210.07848.

Patents

1. Kadam, J. V., Georgiou, A. T., Sheth, K. R., Li, W., Onel, O., and **Pulsipher, J. L.** (Dec. 2020). "Systems and Methods of Monitoring and Controlling an Industrial Process". U.S. Patent Application 17/126151.

Newsletter Articles (Peer Reviewed)

1. **Pulsipher, J. L.** and Zavala, V. M. (Mar. 2022). "InfiniteOpt.jl: A Julia Package for Infinite-Dimensional Optimization". Vol. 17. 1. International Federation of Operational Research Societies. URL: https://www.ifors.org/newsletter/ifors-news-march-2022.pdf.

Software

- **InfiniteOpt.jl:** An Infinite-Dimensional Modeling Framework (Julia)
  Role: Lead Developer
  Source: https://github.com/infiniteopt/InfiniteOpt.jl
- **DisjunctiveProgramming.jl:** A Modeling Framework for Discrete Decision-Making via GDP (Julia)
  Role: Developer
  Source: https://github.com/hdavid16/DisjunctiveProgramming.jl
- **FlexibilityAnalysis.jl:** A Framework for Flexibility Analysis (Julia)
  Role: Lead Developer
  Source: https://github.com/pulsipher/FlexibilityAnalysis.jl
- **compvislab:** A Toolbox for Computer Vision Control (Python)
  Role: Lead Developer
- **Volare:** Optimized Flight Planner for UAV Inspection (Android)
  Role: Developer

Research Presentations

Invited Talks

18. **Pulsipher, J. L.** (Apr. 2023). "Stochastic Programming Inspired Modeling Techniques for Shaping Dynamic Trajectories". *IEEE TC Process Control Online Seminar Series*. Online.
17. **Pulsipher, J. L.** (Feb. 2023). "Optimization under Uncertainty: From Data to Models to Decision-Making". *University of South Florida Chemical, Biological and Materials Engineering Department Seminar*. Tampa, FL.
16. **Pulsipher, J. L.** (Jan. 2023). "Optimization under Uncertainty: From Data to Models to Decision-Making". *University of Waterloo Chemical Engineering Department Seminar*. Waterloo, Canada.
15. **Pulsipher, J. L.** (Jan. 2023). "Optimization under Uncertainty: From Data to Models to Decision-Making". *Rensselaer Polytechnic Institute Chemical and Biological Engineering Department Seminar*. Troy, NY.
14. **Pulsipher, J. L.** (Jan. 2023). "Optimization under Uncertainty: From Data to Models to Decision-Making". *Brigham Young University Chemical Engineering Department Seminar*. Provo, UT.
13. **Pulsipher, J. L.**, Ovalle, D., Perez, H. D., Laird, C. D., and Grossmann, I. E. (Jan. 2023). "Characterizing Event Constraints with Generalized Disjunctive Programming". *Foundations of Computer Aided Process Operations / Chemical Process Control 2023*. San Antonio, TX.
12. **Pulsipher, J. L.** (Nov. 2022). "An Introduction to Process Systems Engineering with Applications in Energy and Disease Control". *University International Seminar at Universidad Nacional Micaela Bastidas de Apurímac*. Apurímac, Peru.
11. **Pulsipher, J. L.**, Laird, C. D., and Grossmann, I. E. (Nov. 2022). "Event Constrained Optimization". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. **Computing & Systems Technology Division Plenary**. Phoenix, AZ.
10. **Pulsipher, J. L.** and Laird, C. D. (Oct. 2022). "Advances In Solving Infinite-dimensional Optimization Problems With Infiniteopt.jl". *The Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting*. Indianapolis, IN.

9. **Pulsipher, J. L.** (Sept. 2022). "Software-Accelerated Theoretical Discovery via InfiniteOpt.jl". *Carnegie Mellon University Process Systems Engineering Seminar*. Pittsburgh, PA.
8. **Pulsipher, J. L.**, Davidson, B. R., and Zavala, V. M. (July 2022). "Random Field Optimization". *International Conference on Continuous Optimization (ICCOPT)*. Bethlehem, PA.
7. **Pulsipher, J. L.**, Coutinho, L., and Zavala, V. M. (June 2022). "Computer Vision Aided Process Control: Methods for Enhanced Autonomy and Robustness". *Advanced Manufacturing & Processing Conference (AMPc)*. Bethesda, MD.
6. **Pulsipher, J. L.** and Laird, C. D. (June 2022). "Data-Driven Surrogates for Infinite-Dimensional Optimization Problems". *CORS/INFORMS International Conference*. Vancouver, Canada.
5. **Pulsipher, J. L.**, Zhang, W., and Zavala, V. M. (Feb. 2021). "InfiniteOpt.jl: A unifying abstraction for Infinite-Dimensional Optimization". *The Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting*. Anaheim, CA.
4. **Pulsipher, J. L.**, Zhang, W., and Zavala, V. M. (Feb. 2021). "Tackling Infinite-Dimensional Optimization Problems with InfiniteOpt.jl". *Texas-Wisconsin-California Control Consortium (TWCCC) Semi-Annual Meeting*. Online.
3. **Pulsipher, J. L.**, Zhang, W., and Zavala, V. M. (Nov. 2020). "Modeling Infinite-Dimensional Optimization Problems with InfiniteOpt.jl". *The Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting*. Online.
2. **Pulsipher, J. L.** and Zavala, V. M. (Oct. 2020). "Modeling Infinite-Dimensional Optimization Problems with InfiniteOpt.jl". *UW-Madison Chemical & Biological Engineering Computational Seminar Series*. Madison, WI.
1. **Pulsipher, J. L.** and Zavala, V. M. (Oct. 2019). "Engineering Optimal Systems". *UW-Madison Undergraduate Seminar Series*. Madison, WI.

Other Talks

12. **Pulsipher, J. L.** (Aug. 2023). "Stochastic Programming Inspired Modeling Techniques for Shaping Dynamic Trajectories". *Modeling and Optimization: Theory and Applications (MOPTA)*. Bethlehem, PA.
11. **Pulsipher, J. L.**, Ovalle, D., Perez, H., Grossmann, I. E., and Laird, C. D. (Mar. 2023). "Generalized Disjunctive Programming Formulations for Event Constraints". *Center for Advanced Process Decision-making (CAPD) Annual Meeting*. Pittsburgh, PA.
10. **Pulsipher, J. L.**, Coutinho, L., and Zavala, V. M. (Nov. 2022). "Computer Vision Aided Process Control: Methods for Enhanced Autonomy and Robustness". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Phoenix, AZ.
9. **Pulsipher, J. L.**, Davidson, B. R., and Zavala, V. M. (Nov. 2022). "New Measures for Shaping Trajectories in Dynamic Optimization". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Phoenix, AZ.
8. **Pulsipher, J. L.** (July 2022). "Advances in Transformations and NLP Modeling for InfiniteOpt.jl". *Julia-Con*. Online.
7. **Pulsipher, J. L.**, Davidson, B. R., and Zavala, V. M. (June 2022). "New Measures for Shaping Trajectories in Dynamic Optimization". *IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (DYCOPS)*. Busan, South Korea.
6. **Pulsipher, J. L.** and Zavala, V. M. (Nov. 2021). "Random Field Optimization". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Boston, MA.
5. **Pulsipher, J. L.**, Zhang, W., and Zavala, V. M. (Nov. 2021). "InfiniteOpt.jl: A Unifying Abstraction for Infinite-Dimensional Optimization". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Boston, MA.
4. **Pulsipher, J. L.**, Zhang, W., and Zavala, V. M. (July 2021). "InfiniteOpt.jl: A JuMP Extension for Tackling Infinite-Dimensional Optimization Problems". *Julia-Con*. Online.
3. **Pulsipher, J. L.**, Zhang, W., and Zavala, V. M. (Nov. 2020). "Modeling Infinite-Dimensional Optimization Problems with InfiniteOpt.jl". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Online.

2. **Pulsipher**, **J. L.** and Zavala, V. M. (Nov. 2019). "A Scalable Stochastic Programming Approach for Designing Flexible Systems". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Orlando, FL.

1. **Pulsipher**, **J. L.** and Zavala, V. M. (Nov. 2018). "A Mixed-Integer Conic Programming Formulation for Computing the Flexibility Index Under Multivariate Gaussian Random Variables". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Pittsburgh, PA.

Short Courses

4. **Pulsipher**, **J. L.** (May 2023). "Modeling with Julia and JuMP". *Pan-American Advanced Studies Institute on Optimization and Data Science for Net-Zero Carbon and Sustainability (PASI)*. Buenos Aires, Argentina.

3. **Pulsipher**, **J. L.** (June 2022). "InfiniteOpt.jl: A Julia Package for Infinite-Dimensional Optimization". *IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (DYCOPS)*. Busan, South Korea.

2. **Pulsipher**, **J. L.** (May 2022). "InfiniteOpt.jl: A Julia Package for Infinite-Dimensional Optimization". *Carnegie Mellon University*. Pittsburg, PA.

1. **Pulsipher**, **J. L.** (Jan. 2022). "Julia: A Crash Course". *University of Wisconsin-Madison*. Madison, WI.

Posters

10. Ammari, B. L., Johnson, E. S., Stinchfield, G., Kim, T., Bynum, M., Hart, W. E., **Pulsipher**, **J. L.**, and Laird, C. D. (July 2023). "Optimization in Engineering with Embedded Linear Model Decision Trees". *Modeling and Optimization: Theory and Applications (MOPTA)*. Davis, CA.

9. **Pulsipher**, **J. L.**, Ovalle, D., Perez, H., Grossmann, I. E., and Laird, C. D. (Mar. 2023). "Generalized Disjunctive Programming Formulations for Event Constraints". *Center for Advanced Process Decision-making (CAPD) Annual Meeting*. Pittsburgh, PA.

8. **Pulsipher**, **J. L.** (Nov. 2022). "Decision-Making and Learning Under Uncertainty for Complex Systems". *The American Institute of Chemical Engineering (AICHE) Annual Meeting*. Phoenix, AZ.

7. Kompalli, S., Merakli, M., Ammari, B. L., **Pulsipher**, **J. L.**, Qian, Y., Bynum, M. L., Furman, K. C., and Laird, C. D. (Sept. 2022). "Computational Performance of Algebraic Modeling Languages with Alternate Solver Interfaces and Advanced Modeling Components". *Enterprise-Wide Optimization (EWO) Annual Meeting*. Pittsburgh, PA.

6. **Pulsipher**, **J. L.**, Grossmann, I. E., Laird, C. D., and Zavala, V. M. (June 2022). "InfiniteOpt.jl: A Framework for Tackling Infinite-Dimensional Optimization Problems". *Advanced Manufacturing & Processing Conference (AMPc)*. Bethesda, MD.

5. **Pulsipher**, **J. L.**, Grossmann, I. E., Laird, C. D., and Zavala, V. M. (Mar. 2022). "InfiniteOpt.jl: A Framework for Tackling Infinite-Dimensional Optimization Problems". *Center for Advanced Process Decision-making (CAPD) Annual Meeting*. Pittsburgh, PA.

4. **Pulsipher**, **J. L.** (Sept. 2021). "InfiniteOpt.jl: A Unifying Abstraction for Infinite-Dimensional Optimization". *LatinXChem*. Twitter.

3. **Pulsipher**, **J. L.** and Zavala, V. M. (Sept. 2018). "Analyzing and Quantifying the Flexibility of Complex Systems". *Machine Learning and Optimization Research (MOR) Meeting*. Madison, WI.

2. **Pulsipher**, **J. L.** and Zavala, V. M. (Sept. 2018). "Measures of System Resilience and Flexibility". *Texas-Wisconsin-California Control Consortium (TWCCC) Semi-Annual Meeting*. Madison, WI.

1. Martin, R. A., **Pulsipher**, **J. L.**, Lund, C., Clark, J., Franke, K., and Hedengren, J. D. (Aug. 2013). "UAV-Based Infrastructure Monitoring". *Center for Unmanned Aircraft Systems (C-UAS) Annual Meeting*. Snowbird, UT.

Research Mentoring

PhD Students

2023 – 2023 **Arsh Bhatia,** Carnegie Mellon University

2022 – 2023 **Bashar Ammari,** Carnegie Mellon University

Daniel Ovalle, Carnegie Mellon University

Master's Students

2023 – Present **Carlos Andres Elorza Casas,** University of Waterloo

2023 – 2023 **Louis Tobergte,** Carnegie Mellon University, Now at West Point

2022 – 2023 **Sai Kompalli,** Carnegie Mellon University, Now at Purdue University

Shumeng Lin, Carnegie Mellon University, Now at NETL

2022 – 2022 **Yicheng Xi,** Carnegie Mellon University

Yufeng Qian, Carnegie Mellon University, Now at University of Pittsburgh

Undergraduate Students

2021 – 2022 **Baide Xue,** University of Wisconsin-Madison, Now at Pyran

2019 – 2022 **Benjamin R. Davidson,** University of Wisconsin-Madison, Now at ExxonMobil

2020 – 2021 **Luke D. J. Coutinho,** University of Wisconsin-Madison, Now at Koch Industries

Tyler J. Hongisto, University of Wisconsin-Madison, Now at Proctor & Gamble

2018 – 2018 **Daniel Rios,** University of Wisconsin-Madison, Now at Texas Instruments

Research Collaborators (Past 3 Years)

Universities

UW-Madison Victor Zavala (Chemical & Biological Eng.), Dan Negrut (Mechanical Eng.), Jim Luedtke (Industrial & Systems Eng.), Megan MacLean (Biomedical Eng.)

CMU Carl Laird, Ignacio Grossmann, David Bernal, Ana Torres, Coty Jen, Lorenz Biegler (Chemical Eng.)

Tufts Christos Georgakis (Chemical Eng.)

UNS (Argentina) Soledad Diaz (Chemical Eng.)

UFRJ (Brazil) Argimiro Secchi (Chemical Eng.)

UWaterloo Luis Ricardez-Sandoval (Chemical Eng.)

National Laboratories

Argonne Mihai Anitescu, Sungho Shin (Mathematics & Computer Science)

Sandia Michael Bynum, Bill Hart, Emma Johnson (Discrete Math & Optimization)

NETL Miguel Zamarripa, Markus Drouven, Philip Tominac (Process Systems Eng.)

PNNL Zhenyu Huang (Optimization & Control), David Barajas-Solano, Jing Li (Computational Science & Mathematics)

Industry

ExxonMobil Tyler Soderstrom (Online Optimization & Control), Merve Merakli, Kevin Furman (Data & Decision Sciences)

ParallelWorks Michael Wilde, Alvaro Vidal, Matthew Shaxted

Service

Scientific

- **Session Organizer,** MOPTA 2023 (Advanced Decomposition and Hybrid Strategies for Optimization under Uncertainty), INFORMS 2021 (Julia Packages for the Modeling and Solution of Optimization Problems)
- **Conference Organizer,** Pan-American Advanced Studies Institute on Optimization and Data Science for Net-Zero Carbon and Sustainability 2023, JuMP-dev 2023
- **Organizing Committee Member,** UW-Madison CBE Computing Seminar Series (2020 – 2021)
- **Treasurer,** UW-Madison Chemical Engineering Graduate Student Association (2020 – 2021)
- **Session Chair,** AICHE 2023, MOPTA 2023, INFORMS 2022, DYCOPS 2022, CORS/INFORMS 2022, INFORMS 2021
- **Journal Reviewer,** Computers & Chemical Engineering, AICHE Journal, Chemical Engineering Science, IEEE Transactions on Control Systems Technology, Canadian Journal of Chemical Engineering, Latin American Applied Research

Community

- **Volunteer Leader,** LDS Church - Spanish Speaking (2019 – Present)
- **Volunteer,** LDS Church (2016 – Present)
- **Volunteer Missionary,** Peru Trujillo Mission - Spanish Speaking (2014 – 2016)
- **Volunteer,** Elderly Chore Services in Yakima, WA (2010 – 2012)
- **Volunteer Instructor,** Swim Lessons for All Project (2012)

Skills

Languages	Fluent in English and Spanish
Coding	Julia, Python, C, C++, Java, MATLAB, VBA, Bash, Android, Git, LaTeX, …
Web Dev	HTML, CSS, JavaScript, Markdown, Liquid, Jekyll
Modeling	JuMP, AMPL, Pyomo, Gekko, Simulink, Aspen, PyTorch, Keras, Flux