

# Joshua Pulsipher, Ph.D.

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🌐 <https://pulsipher.info>



## 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., Merakli, 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. (July 2023). "Linear Model Decision Trees as Surrogates in Optimization of Engineering Applications". In: *Computers & Chemical Engineering*.  URL: <https://doi.org/10.1016/j.compchemeng.2023.108347>.
- 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)

- 7 Bhatia, A., Varelá, D. O., **Pulsipher, J. L.**, Zamarripa, M. A., Drouvenc, M. G., Grossmann, I., and Laird, C. D. (July 2024). "A Computational Framework for Optimizing and Evaluating Critical Mineral Opportunities in Produced Water Networks". *Foundations of Computer-aided Process Design. In Press*.
- 6 Maciel, X. P., Ripper, P., Dias Garcia, J., Maculan, N., Bernal, D. E., and **Pulsipher, J. L.** (June 2024). "Disjunctive Programming meets Quadratic Unconstrained Binary Optimization". *34th European Symposium on Computer Aided Process Engineering / 15th International Symposium on Process Systems Engineering (ESCAPE34/PSE24). In Press*.
- 5 **Pulsipher, J. L.** and Shin, S. (June 2024). "Scalable Modeling of Infinite-Dimensional Nonlinear Programs with InfiniteExaModels". *34th European Symposium on Computer Aided Process Engineering / 15th International Symposium on Process Systems Engineering (ESCAPE34/PSE24). In Press*.
- 4 Ovalle, D., **Pulsipher, J. L.**, Gomez, C., Gomez, J. M., Laird, C. D., Drouven, M., and Grossmann, I. E. (June 2023). "Study of Different Formulations for the Multiperiod Blending Problem Applied to Lithium Recovery from Produced Water". *33rd European Symposium on Computer Aided Process Engineering*.  URL: <https://doi.org/10.1016/B978-0-443-15274-0.50295-X>.
- 3 Ammari, B. L., Merakli, M., Kompalli, S., Qian, Y., **Pulsipher, J. L.**, Bynum, M., Furman, K. C., and Laird, C. D. (Jan. 2023). "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. (Jan. 2023). "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). “Convolutional 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.** (Nov. 2022). “Systems and Methods of Monitoring and Controlling an Industrial Process”. U.S. Patent 11513496.

## 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>
- **OMLT**: A Framework for Embedding ML Models in Optimization Problems (Python)  
Role: Developer  
Source: <https://github.com/cog-imperial/OMLT>
- **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

- 16 Maciel, X. P., Ripper, P., Dias Garcia, J., Maculan, N., Bernal, D. E., and **Pulsipher, J. L.** (June 2024). "Disjunctive Programming meets Quadratic Unconstrained Binary Optimization". *34th European Symposium on Computer Aided Process Engineering / 15th International Symposium on Process Systems Engineering (ESCAPE34/PSE24)*. Florence, Italy.
- 15 **Pulsipher, J. L.** and Shin, S. (June 2024). "Scalable Modeling of Infinite-Dimensional Nonlinear Programs with InfiniteExaModels.jl". *34th European Symposium on Computer Aided Process Engineering / 15th International Symposium on Process Systems Engineering (ESCAPE34/PSE24)*. Florence, Italy.
- 14 **Pulsipher, J. L.**, Ovalle, D., Laird, C., and Grossmann, I. (Nov. 2023). "Advanced Solution Techniques for Event Constrained Programming". *The American Institute of Chemical Engineering (AIChE) Annual Meeting*. Orlando, FL.
- 13 **Pulsipher, J. L.** (Aug. 2023). "Stochastic Programming Inspired Modeling Techniques for Shaping Dynamic Trajectories". *Modeling and Optimization: Theory and Applications (MOPTA)*. Bethlehem, PA.
- 12 **Pulsipher, J. L.** (July 2023). "Recent Progress on InfiniteOpt.jl and DisjunctiveProgramming.jl". *JuMP-dev*. Cambridge, MA.



- 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

- 5 **Pulsipher, J. L.** (July 2024). “Optimal Control in Julia with JuMP and InfiniteOpt”. *The 12th IFAC Symposium on Advanced Control of Chemical Processes (ADCHEM 2024)*. Toronto, ON.
- 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*. Pittsburgh, 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

- 2023 – Present  **Stefan Mazzadi**, University of Waterloo
- 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)

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### 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, Ana Torres, Coty Jen, Lorenz Biegler (Chemical Eng.)  |
| Tufts           | Christos Georgakis (Chemical Eng.)   |
| Purdue          | David Bernal (Chemical Eng.)   |
| UNS (Argentina) | Soledad Diaz (Chemical Eng.)   |
| UFRJ (Brazil)   | Argimiro Secchi (Chemical Eng.)  |
| UWaterloo       | Luis Ricardez-Sandoval, Valerie Ward, Christian Euler, Marc Aucoin (Chemical Eng.), Elizabeth Weckman (Mech. 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

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### Scientific

- **Session Organizer**, ACC 2024 (Tackling Control Problems with Open-Source Software in Julia and Python), 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**, Great Lakes PSE Workshop 2024, JuMP-dev 2024, Pan-American Advanced Studies Institute on Optimization and Data Science for Net-Zero Carbon and Sustainability 2023, Great Lakes PSE Workshop 2023, JuMP-dev 2023
- **Committee Member**, UWaterloo Engineering Computing Committee (2023 – Present), UWaterloo Chemical Engineering Undergraduate Review Committee (2023 – Present)
- **Organizing Committee Member**, UW-Madison CBE Computing Seminar Series (2020 – 2021)
- **Treasurer**, UW-Madison Chemical Engineering Graduate Student Association (2020 – 2021)
- **Session Chair**, ACC 2024, 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, International Federation of Automatic Control
- **Volunteer**, UWaterloo 2023 Fall Open House, 2023 ChemE Amazing Race



## 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

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|-----------|--|
| Languages | 📖 Fluent in English and Spanish  |
| Coding    | 📖 Julia, Python, C, C++, Java, MATLAB, VBA, Bash, Android, Git, L <sup>A</sup> T <sub>E</sub> X, ... |
| Web Dev   | 📖 HTML, CSS, JavaScript, Markdown, Liquid, Jekyll  |
| Modeling  | 📖 JUMP, AMPL, Pyomo, Gekko, Simulink, Aspen, PyTorch, Keras, Flux                                    |