

# Eric Pulick

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A highly motivated fifth-year Industrial and Systems Engineering PhD candidate interested in sequential decision making and data science problems in human-centered applications.

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## Education

- 2021–present **Ph.D. in Industrial and Systems Engineering**, *University of Wisconsin-Madison*.  
2021–2024 **M.S. in Industrial and Systems Engineering**, *University of Wisconsin-Madison*.  
GPA – 4.00/4.00  
2015–2016 **M.S.E. in Mechanical Engineering**, *University of Michigan*, Ann Arbor, MI.  
GPA – 4.00/4.00  
2011–2015 **B.S.E. in Mechanical Engineering**, *University of Michigan*, Ann Arbor, MI.  
*summa cum laude*, GPA – 3.94/4.00

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## Publications

- Pulick, E.**, Carey, K., Qyli, T., Oguss, M., Picart, J., Penumalee, L., Nezirova, L., Tully, S., Gilbert, E., Shah, N., Ravichandran, U., Afshar, M., Edelson, D., Mintz, Y., & Churpek, M., Treatment Recommendations for Clinical Deterioration on the Wards: Development and Validation of Machine Learning Models, *Manuscript in preparation*  
**Pulick, E.** & Mintz, Y. (2025). An Adaptive Control Approach to Treatment Selection for Substance Use Disorders, *Accepted, to appear at the 2025 IEEE Conference on Decision and Control*, Preprint DOI: arXiv:2504.01221  
**Pulick, E.**, Curtin, J., & Mintz, Y. (2025). Idiographic Lapse Prediction with State Space Modeling: Algorithm Development and Validation, *Journal of Medical Internet Research - Formative Research*, DOI: 10.2196/73265  
**Pulick, E.**, Menkov, V., Mintz, Y., Kantor, P. B., & Bier, V. M. (2024). Comparing Reinforcement Learning and Human Learning with the Game of Hidden Rules. *IEEE Access*. DOI: 10.1109/ACCESS.2024.3395249  
**Pulick, E.**, Korth, P., Grim, P., & Jung, J. (2016). Modeling Interaction Effects in Polarization: Individual Media Influence and the Impact of Town Meetings. *Journal of Artificial Societies and Social Simulation*, 19(2), 1. DOI: 10.18564/jasss.3021

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## Technical Reports

- Bier, V. M., Feldman, J., Gallos, L., Kantor, P. B., Lupyan, G., Mintz, Y., **Pulick, E.**, Sala, F., & Wang, H. (2025). Joint Research on Human and Artificial Intelligence. DOI: 10.31234/osf.io/7xydm\_v1  
**Pulick, E.**, Bharti, S., Chen, Y., Menkov, V., Mintz, Y., Kantor, P., & Bier, V. M. (2022). The Game of Hidden Rules: A New Kind of Benchmark Challenge for Machine Learning. DOI: arXiv:2207.10218v1

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## Previous & Invited Talks

- 2025 *Algorithms for Treatment Selection in Substance Use Disorders.*  
INFORMS Annual Meeting, Atlanta, GA, 2025
- 2024 *Using State Space Models for Personalized Lapse Prediction.*  
INFORMS Annual Meeting, Seattle, WA, 2024
- 2023 *Comparing Human Learning and Reinforcement Learning.*  
Open Science Grid School, Madison, WI, 2023

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## Research Experience

### 2021-present **Research Assistant**

- Advisor Professor Yonatan Mintz, Industrial & Systems Engineering, University of Wisconsin-Madison
- Project Treatment Recommendation Algorithms for Clinical Deterioration  
Built novel recurrent neural network architectures for predicting lifesaving treatments for hospital patients experiencing clinical deterioration. Benchmarked performance of proposed methods using a gold-standard, chart-reviewed multi-center dataset. Manuscript in preparation.
- Project Adaptive Control Algorithms for Substance Use Disorder (SUD) Treatment Selection  
Proposed an adaptive control framework for SUD treatment selection. Patient engagement is modeled as a linear dynamic process with unknown parameters. Patient parameters are learned using maximum likelihood estimation and are used as inputs to novel treatment selection algorithms. Manuscript accepted to the 2025 IEEE Conference on Decision and Control.
- Project Personalized Prediction Models for Alcohol Use Disorder (AUD)  
Created a personalized state-space model structure for predicting alcohol lapse for individuals recovering from AUD. Model parameters are learned for each participant as maximum a posteriori estimates from mood surveys submitted daily as part of study. Personalized models shown to outperform state-of-the-art population level machine learning models. Manuscript published at the Journal of Medical Internet Research - Formative Research.
- Project Comparing Reinforcement Learning and Human Learning  
Studied differences in human learning and reinforcement learning (RL) to inform how RL tools are best deployed alongside humans in real-world tasks. Designed and performed experiments to study how the structure of a learning task affects learning performance for humans and various reinforcement learning algorithms. Implemented Q-learning and policy-gradient based methods in PyTorch and explored the impact of hyperparameter structure through ablation studies. Experiments run on the University of Wisconsin Center for High Throughput Computing (CHTC). Published in IEEE Access.

### 2014-2016 **Research Assistant**

- Advisor Professor Patrick Grim, Center for Complex Systems, University of Michigan

Project Influence of Media on Political Polarization

Created an agent-based model exploring the interplay between direct, human-to-human interaction and media influence on political idea spread. Numerous mechanisms for each were modeled to assess their impact in driving idea consensus or polarization. Published results in the Journal of Artificial Societies and Social Simulation.

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## Service

UW-Madison INFORMS Student Chapter

- 2024-2025 **President.** Led all chapter operations, particularly setting priorities, organizing chapter activities, and managing communication with the Industrial and Systems Engineering department and College of Engineering.
- 2023-2024 **Vice President.** Organized sessions for student development, guest speakers, research presentations, and skills trainings.
- 2022-2023 **Communications Officer.** Managed all communication from the student board to the chapter. Assisted other officers to organize professional and social events for the chapter.

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## Teaching Experience

2023 Teaching Assistant

Course ISYE723 - Dynamic Programming

Description Mathematics of dynamic programming, including model-based and model-free reinforcement learning. Created new homework assignments/solutions and graded assignments. 19 students.

2023 Teaching Assistant

Course ISYE313 - Engineering Economic Analysis

Description Foundations of engineering accounting, including cash flow, discounting, and decision-making frameworks. Prepared new discussion materials, held weekly discussion sections, answered student questions, and graded homework and exams. 50 students.

2015–2016 Teaching Assistant

Course MECHENG 433 – Advanced Energy Solutions

Description Thermodynamics of modern power generation technologies and analysis of their real-world use. Held office hours, answered student questions, and created supplementary lecture materials and videos for students. 100 students.

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## Awards

- 2024 Rea C and David H Gustafson Scholarship - Merit scholarship for outstanding performance within the Industrial and Systems Engineering department, \$2,000 award
- 2011-2015 Stamps Leadership Scholarship - Merit scholarship awarded to 18 top applicants to U-M, \$80,000 total award
- 2011-2015 Dean's List, College of Engineering - Awarded to undergraduates maintaining 3.50+ GPA

- 2011-2015 James B. Angell Scholar - Awarded for consecutive ‘straight-A’ terms
- 2011-2012 William J. Branstrom Freshman Prize - Awarded to first year undergraduates ranking in the top 5% of their class

## Professional Experience

- 2018–2021 **Systems/Software Engineer**, *BOSCH*, Plymouth, MI.  
Developed software for automotive brakes products in autonomous vehicle applications, with an emphasis on hydraulic and system health monitoring functions. Led rollout of new tools and methods to improve the organization’s handling of requirements and software testing.
- 2016–2018 **Graduate Rotational Engineer**, *BOSCH*, various locations.  
Rotational development program for MS graduates, composed of four half-year assignments in various Bosch functions.
- **Rotation 4 - Software Engineer**, Abstatt, Germany  
Created Matlab tooling for ‘re-use’ analysis to assess software re-usability across different brake product customer projects.
  - **Rotation 3 - Technical Project Manager**, Plymouth, MI  
Coordinated internal development of Bosch braking solutions for GM Epsilon platform vehicles (e.g. Chevrolet Malibu, Buick Lacrosse) across various model years.
  - **Rotation 2 - Government Affairs Analyst**, Washington, D.C.  
Provided white papers on legislative topics relevant to Bosch products and organized annual international Bosch government affairs conference.
  - **Rotation 1 - Research Engineer**, Farmington Hills, MI  
Designed experiments investigating effects of direct injection fuel spray parameters on soot production and created model for minimizing emissions. Built data visualization tool in Matlab for optimizing engine emissions across different tested calibration parameters.
- Summer 2015 **Mechanical Engineering Intern**, *BURNS & MCDONNELL*, Kansas City, MO.  
Consulted on various power plant projects. Designed and documented a lubrication oil system for a plant flue gas recirculation blower. Performed detailed heat transfer analysis to size insulation for plant ash recycling silo.
- Summer 2014 **Manufacturing Intern**, *GE-HITACHI NUCLEAR ENERGY*, Wilmington, NC.  
Spearheaded tooling management project; designed SQL database capable of tracking shop tooling usage, ultimately capable of integration into a full-fledged manufacturing requirements planning (MRP) system.
- Summer 2013 **Quality Engineering Intern**, *VIDEOJET TECHNOLOGIES*, Wood Dale, IL.  
Led investigative team in root-cause analysis to resolve critical product failure; containment efforts brought failure rates from over 50% to below 0.1%.
- Summer 2012 **Mechanical Engineering Intern**, *VIDEOJET TECHNOLOGIES*, Wood Dale, IL.  
Collaborated on value analysis/value engineering projects – personally accounted for improvements estimated at approximately \$100,000 in annual savings.

## Computer Skills

- Languages Python, R, MATLAB, Julia, Stan
- Tools PyTorch, NumPy, Pandas, Seaborn, Gurobi, JuMP, HTCCondor, git, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office