

# David Rushing Dewhurst, PhD

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## Experience

**D R Dewhurst, Inc.: President**, June 2023 – present

- Provide strategy and technical consulting to US Government clients

**Charles River Analytics: Sr. Scientist**, Oct 2022 – present; **Scientist**, Aug 2020 – Oct 2022

- Lead >\$12M of DARPA research programs in systemic financial risk, information operations, and human-machine interfaces; lead, mentor, manage, and hire teams of 2 – 10 AI research scientists and ML/software engineers
- Coalesce disparate existing and new research efforts into unified Probabilistic Digital Engineering business line with \$1M invested
- Created four universal probabilistic programming languages and probabilistic graphical model library; designed/implemented corporate financial forecasting toolkit; invented statistical inference algorithms

**MassMutual: Lead Data Scientist**, Feb 2020 – Aug 2020; **PhD Fellow**, Sep 2019 – Feb 2020

- Designed/implemented automated economic capital risk management system that replaced legacy spreadsheet-based solution
- Architect and develop comprehensive Bayesian structural time series library for VaR and other risk measure computations on complex asset portfolios

**MITRE Corporation: Computer Science Fellow**, Jun 2017 – Sep 2019

- Design and implement digital signal processing algorithms for petabyte-scale financial transaction analysis, author empirical studies of US equities market microstructure; received Trailblazer award for establishing new company initiative in computational finance

## Education

**PhD** (Feb 2020) – *University of Vermont*: Complex Systems and Data Science

- 100% funded: DARPA #W56KGU-17-C-0010 (2018 – 2019); MassMutual (2019 – 2020)

**MS** (May 2018) – *University of Vermont*: Mathematics

- 100% funded: GTA (2016 – 2017), DARPA #W56KGU-17-C-0010 (2017 – 2018)

**Séminaire de Mathématiques Supérieures** (Jul 2017) – MSRI/University of Montreal

- 100% funded: MSRI scholarship

**BA** (May 2016) – *University of Vermont*: Economics, Mathematics, and Political Science

## Open-source software

- **lppl** (<https://davidrushingdewhurst.com/lppl/>): resource-efficient probabilistic programming language hosted in modern C++; highly performant modeling and inference (symbolic regression solved in 130ms with 1.32MB RAM usage, prediction in 4us)
- **stsb3** (<https://davidrushingdewhurst.com/stsb3/>): Bayesian structural time series grammar; flexible object-oriented, arbitrarily extensible structural time series models with inference, prediction, and forecasting for free; program-wide resource for systemic financial risk quantification DARPA program

## Skills

- Software leadership: Agile software engineering (Scrum/Kanban) and product management
- General leadership: financial planning; project change/turnaround, strategic planning and roadmaps
- Programming: C++, C, Python, Julia, other languages; large-scale software development
- Tools: git, jira, disparate C and C++ libraries, pytorch ecosystem