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 – June 2023; 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
- Programming: C++, C, Python, Julia, other languages; large-scale software development
- Tools: git, jira, disparate C and C++ libraries, pytorch ecosystem