
William “Jamie” Fravel

Curriculum Vitae

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Employment

Postdoc with the Faculty of Mathematics and Physics, Institute of Informatics at Charles University, Prague, Czech Republic. Supervisor: Martin Koutecký <i>research.koutecky.name</i>	September 2025 – Present
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Education

Ph.D. in Operations Research from the Grado Department of Industrial and Systems Engineering at Virginia Tech	October 2024
B.S. in Mathematics and Physics from Furman University, Magna Cum Laude	May 2019
Certificate of Future Professoriate from the Graduate School at Virginia Tech	May 2024
Recipient Rehmert-Nachlas PhD Fellowship	2024-2025

Teaching

Postdoc at Charles University

Algorithms and Data Structures 2 – Tutorial – In Person – upcoming	Winter 2026/27
Algorithms and Data Structures 1 – Tutorial – 36 students – in person	Spring 2026

Instructor at Virginia Tech

Deterministic Operations Research 1 (Linear Programming) SPOT*Avg 5.18/6 Department Avg 5.14/6 145 Students In Person	Spring 2023
Deterministic Operations Research 2 (Topics in Optimization) SPOT Avg 5.49/6 Department Avg 5.09/6 10 Students In Person	Fall 2022
Deterministic Operations Research 1 (Linear Programming) SPOT Avg 5.26/6 Department Avg 5.30/6 34 Students Live Remote	Summer 2022

Teaching Assistant at Virginia Tech

Optimization 2 (Graduate)	Spring 2024
Deterministic Operations Research 2	Fall 2019

Mentoring

Master’s Theses

Co-advisor— <i>Optimizing Propaganda using a Graphical Model and Mathematical Programming</i> , Aryan Kumar. Charles University MFF, Prague, Czech Republic. Grade: Excellent [link]	June 2026
Assistant advisor— <i>Integrals Over Polyhedra via Random Walks</i> (working title), Aleš Prokop. Charles University MFF, Prague, Czech Republic. Grade: Good [link]	June 2026

Bachelor’s Theses/Senior Design

Co-advisor— <i>Graph Algorithm Visualizers in the Classroom</i> (working title), Phone Khant Lu. Charles University MFF, Prague, Czech Republic. Grade: Pending	Ongoing
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*SPOT stands for Student Perception of Teacher and is an anonymous student survey given at the end of each semester.

Co-advisor—*Automated hard instance search via black-box optimization*, Pavlo Tsitseï. Charles University MFF, Prague, Czech Republic. Grade: Excellent September 2026

Optimizing Outbound Shipments for Devils Backbone Brewing Company, Sam Barnes, Will Carlyle, Ashley Girod, Drew Martin, Zach Schwinger. Virginia Tech ISE, Blacksburg, VA.

— Winners of the 2023 Application of ISE Tools Award: Spring 2023
ise.vt.edu/academics/undergrad/seniordesign-program/SymposiumAwardWinners

— 4th place winners of the 2023 IISE Outstanding ISE Capstone Senior Design Project:
iise.org/Details.aspx?id=47546

Publications

Hard Instances on Demand; Jamie Fravel, Martin Koutecký and Pavlo Tsitseï; accepted to ALENEX27 conference: siam.org/conferences-events/siam-conferences/alenex27/

Automating Idealness Proofs for Binary Programs with Application to Rectangle Packing; Jamie Fravel and Robert Hildebrand; accepted for publication with INFOR: Information Systems and Operational Research from Taylor and Francis; arxiv: 2407.04867

Optimizing Representation in Redistricting: Dual Bounds for Partitioning Problems with Non-Convex Objectives; Jamie Fravel et al; Mathematical Methods of Operations Research from Springer; DOI: 10.1007/s00186-026-00919-5

Continuous Equality Knapsack with Probit-Style Objectives; Jamie Fravel, Robert Hildebrand, and Laurel Travis; Journal of Optimization Theory and Applications from Springer; DOI: 10.1007/s10957-024-02503-5

Black Representation and District Compactness in Southern Congressional Districts; Nicholas Goedert et al; Politics, Groups, and Identities from Taylor and Francis; DOI: 10.1080/21565503.2024.2331723

Dynamically Scheduling NFL Games to Reduce Strength of Schedule Variability; Elizabeth L. Bouzarth et al; Journal of Sports Analytics from ISO Press, pp. 1-13, 2020; DOI: 10.3233/JSA-200428

Working Papers

Optimizing Propaganda using a Graphical Model and Mathematical Programming, Jamie Fravel, Martin Koutecký and Aryan Kumar.

Talks

Invited Lectures

Automating Idealness Proofs for Binary Programs with Application to Rectangle Packing at Charles University May 13th 2025

Upper bounds for Optimal Political Districts at Furman University Mathematics Department Feb. 16th 2023

Conference Presentations

Automating Idealness Proofs for Binary Programs with Application to Rectangle Packing at INFORMS Annual Meeting Oct. 21st, 2024

Optimal Redistricting in Virginia Using Integer Programming and Markov Chain Monte Carlo Techniques at INFORMS Annual Meeting Nov. 10th, 2020

Optimal Redistricting in Virginia Using Integer Programming and Markov Chain Monte Carlo Techniques at Mixed Integer Programming Workshop May 18th, 2020

Research Interests

Integer Programming | Disjunctive Programming | Social Choice | Rectangle Packing | Political Districting

Teaching Interests

Linear Programming | Integer Programming | Nonlinear Optimization | Social Choice | Logic and Proofs
Calculus | Linear Algebra | Intro to Graph Theory | Probability | Complexity and Algorithms

Graduate Coursework

Linear Optimization | Nonlinear Optimization | Integer Programming | Advanced Math Programming
Stochastic Programming | Real Analysis 1 & 2 | Numerical Linear Algebra | Graph Theory
Probability Theory | Statistical Inference | Random Processes | Simulation 1 | Queueing Networks
Contemporary Pedagogy | Preparing the Future Professoriate | Communicating Science

Technical Proficiencies

Python | Gurobi | $\text{\LaTeX}$ | Canvas | Wolfram | Excel | Zoom | Streamlabs | Postal OWL

Professional Affiliations

Charles University, Faculty of Mathematics and Physics, Institute of Informatics	September 2025 – Present
Virginia Tech, Grado Department of Industrial and Systems Engineering	August 2019 – December 2024

Professional References

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Dr. Rohit Kannan
(TA Supervisor)
Virginia Tech
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Dr. Robert Hildebrand
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Dr. Manish Bansal
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