Alexey **Bochkarev**

Researcher in Mathematical Optimization / Operations Research
PhD candidate, Clemson University

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Research interests and experience

Combinatorial optimization, decision diagrams and graphs, network optimization and interdiction. Current project aims to apply game playing and reinforcement learning techniques to the Dynamic Shortest-path Interdiction problem. Previous one dealt with the Consistent Path Problem, trying to get computational edge in combinatorial problems by representing binary constraints (e.g., in a variant of the Facility Location problem) as Binary Decision Diagrams. **Research supervisor:** Dr. J. Cole Smith.

A. Bochkarev, J.C. Smith, On Aligning Non-Order-Associated Binary Decision Diagrams, revision submitted to *INFORMS Journal on Computing*. Results presented at INFORMS Annual conference, 2020.

Education

PhD Industrial Engineering (2018–2021 exp)
Clemson University, US. OR track

MSc/BSc Appl. Math and Physics (2004–2010)
Moscow Institute of Physics and Technology, Russia

M.A. Economics (2008–2010)
New Economic School, Russia

Selected coursework

University: Mathematical Programming, Network Flows, Algorithms and Data Structures, Stochastic Programming intro, Power Markets and Regulations, Game Theory, Probability / Statistics, Foundations of Data Science, Calculus & Co.

Online: Analytics Edge (MITx @ EdX), ML basics (Andrew Ng @ Coursera).

Programming skills

Main stack: Python (gurobipy / gurobi, pulp/cbc, numpy, pandas, matplotlib/plotly/seaborn), R (ggplot, dplyr, tidyverse), C++, Julia (JuMP)
Basic knowledge: PyTorch, Java, Matlab/Octave

Other technical skills

PBS (comp cluster), GNU/Linux, bash; make, git, LaTeX, Emacs, basic GIS (QGIS), Inkscape, beamer / PPT / LO Impress / reveal.js, Jupyter Notebook.

(Human) Languages

English (fluent), Russian (native), German (A1).

Teaching experience

Designed and delivered two 4-days mini-courses for gifted high-school students and early undergrads: *"Practical Intro to Probability"* and *"A Glimplse into Algorithms"*, 2021 (RUS, ENG).
TA in "Intro probability" course, ENG, CU, 2021

Other initiatives: "OR Tech Seminar" (research toolbox, 4 workshops, 2021)

Service & Community

INFORMS Chapter: Secretary (2020), President (2021); "Journal club on Network optimization and interdiction" (2021)
SMTB, ZPSH: summer/winter schools for high-school students, instructor (2020, 2021)

Industry experience

The Federal Grid (FGC UES) (2013–2017)
Electricity transmission, Moscow, Russia

Role: Team head: modeling and analytics
Focus: Performance benchmarking (branches), operational efficiency improvement. Internal regulations/KPI, strategy, analytics, and presentations.

Ministry of Energy of Russia (2013)
Public service: energy (electricity), Moscow, Russia

Role: Deputy team head
Focus: Transmission & distribution grids, benchmarking, economic efficiency. Analytics, presentations.

Roland Berger Strategy Consultants (2010–2013)
Strategic consulting, Moscow, Russia

Role: Intern → Junior Consultant → Consultant
Focus: Infrastructure and construction. Strategy and performance: market entry, supply/demand modeling, growth strategy, efficiency improvement.