Vusal Babashov

Data Scientist

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https://github.com/vbabashov

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About me

I am a Ph.D. candidate in Advanced Analytics. Over the past eight years of academic, industry and consulting work experience, I have specialized in development of predictive and prescriptive quantitative models such as operations research, simulation and machine learning approaches to support complex operational and tactical decision making.

Skills

Python

R

Tableau

Java

Simul8, Simio

Gurobi,CPLEX

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(*)[The skill scale is from 0 (Fundamental Awareness) to 6 (Expert).]

Education

2016- Ph.D. Candidate in Advanced Analytics — Ottawa,ON
Telfer School of Management, University of Ottawa

2010-2012 M.Sc. in Epidemiology and Biostatistics — London, ON
Western University

2008-2010 M.Sc. in Industrial Engineering — Pittsburgh, PA
University of Pittsburgh

2003-2007 B.Sc. in Industrial Engineering — Baku,AZ
Qafqaz University

Relevant Experience

2019- PhD Intern/Analyst,Currency Department, Bank of Canada — Ottawa,ON

- Implemented classical time series forecasting and advanced machine learning models including deep neural network to improve the accuracy of multi-denominational and multi-regional bank note demand forecasting.
  - Methodology: Time Series Forecasting, Machine Learning, Multi-Layer Perceptron, Long Short-Term Memory
  - Analytical Tools: R, Python
- Built Graphical User Interface (GUI) to Note Flow Simulation Tool to support decision making process and allow for various What-If scenario analysis.
  - Methodology: Decision Support System, Discrete Event Simulation
  - Analytical Tools: Java

2016- Doctoral Candidate, Telfer School of Management — Ottawa,ON

- Developed inverse optimization model to estimate the implicit cost of waiting and to set appropriate wait time targets in a multi-priority patient setting.
- Submitted a manuscript for a publication in a peer-reviewed journal that describes the approach in detail.
  - Methodology: Multiple Linear Regression, Quadratic Regression, Deep Neural Network, Convex Inverse Optimization, Simulation
  - Analytical Tools: Python, R, Gurobi, Java, Scikit-learn, Keras, Tensorflow, Pandas, Matplotlib
- Developed dynamic programming model to efficiently allocate healthcare resource capacity and to identify good scheduling policies for patients with multiple visits.
  - Methodology: Markov Decision Processes, Approximate Dynamic Programming, Linear Programming, Integer Programming, Column Generation, Simulation
  - Analytical Tools: CPLEX, Java, GAMS
- Developed a predictive framework using Multi-Criteria Decision Analysis (MCDA) approach for sorting and classification of pharmaceutical drug alternatives for reimbursement recommendation decisions.
- Presented research model and findings at several academic conferences, and published the results in a peer-reviewed journal.
  - Methodology: Multi-Criteria Decision Analysis, UTADIS, Linear Programming
  - Analytical Tools: R, rorutadis
- Taught Business Analytics course to BCom undergraduate students in Fall 2018 and 2019 terms, and served as a Teaching Assistant to Probability, Statistics, Business Analytics, Simulation and Data Mining courses.

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Relevant Experience (Cont'd)

2013-14 Health Economist, Health Quality Ontario — Toronto,ON

- Developed a comparative economic analysis model for a medical technology and provided a funding policy recommendation to the Ministry of Health and Long-Term Care to establish fee for service code as a part of the Ontario Health Insurance Plan (OHIP).
- Wrote a technical report (publicly available on HQO website) on economic analysis that describes the methodology and findings in detail.
- Presented key findings of the analysis to the senior executive team at the Health Quality Ontario.
  - Methodology: Cost-Effectiveness Analysis, Decision Tree, Markov Chains
  - Analytical Tools: TreeAge

2012-14 Health Economist, PIVINA Consulting Inc — Toronto,ON

- Built several cost-effectiveness, cost-utility and budget impact analyses for pharmaceutical manufacturers seeking market access for drugs in Canada.
- Wrote a report for each medical product to explain the specifics of the economic analysis.
  - Methodology: Cost-Effectiveness Analysis, Decision Tree, Survival Analysis, Markov Chains
  - Analytical Tools: MS Excel, SAS

2010-12 Master's Candidate, Western University — London,ON

- Built a discrete-event simulation model to reduce the wait times and improve treatment planning efficiency for radiation planning process at the London Regional Cancer Program.
- Published a manuscript on simulation model and findings in a peer-reviewed academic journal.
  - Methodology: Discrete-Event Simulation
  - Analytical Tools: Simul8
- Developed an early-look economic model for an oncology drug based on the phase II clinical trial.
- Using large administrative data, analyzed clinical resource utilization and conducted survival analysis for a cohort of patients to estimate total cost to the payer.
- Presented results at a conference and published the research work in an academic journal.
  - Methodology: Decision Analytical Model, Markov Chains, Survival Analysis
  - Analytical Tools: SAS, TreeAge

Awards and Distinctions

2019	National Capital Region Thesis Competition Second Place
2016-17	Ontario Graduate Scholarship
2016-2020	Telfer School of Management Admission and Excellence Scholarship
2008-10	Full Graduate Scholarship
2007	Honour's Diploma

Professional Affiliations

- The Institute for the Operations Research and Management Sciences (INFORMS)
- The Canadian Operational Research Society (CORS)