Nicholas Kullman

Operations Research Data Scientist @ Facebook

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SUMMARY

- Experienced (6+ yrs) in operations research, machine learning, and analytics: optimization; simulation; math programming; deep reinforcement learning (artificial intelligence); forecasting; data visualization, manipulation, and analysis
- Innovative: author of 25+ patents
- Strong quantitative skills: PhD Operations Research, MS QERM, BS Physics
- Competent programmer: Python, Java, SQL, Gurobi/Xpress/CPLEX, JavaScript, D3
- Fast learner, effective communicator and problem solver; can adapt and collaborate

EDUCATION

- **PhD Computer Science (Operations Research)** - *University of Tours, France*

- **MS Quant. Ecology & Resource Mgmt.** - *University of Washington, Seattle, WA*

- **BS Physics, minor in mathematics** - *University of Missouri, Columbia, MO*
  - Phi Beta Kappa, Departmental Honors, Summa Cum Laude, 3.98 GPA

SELECTED EXPERIENCE

Operations Research & Data Scientist - *Facebook* - **MAY 2020 - PRESENT**
- Provide decision support for global business operations, leveraging operations research, machine learning, and data science
- Deliver end-to-end project support: problem formulation, modeling, data queries & analyses, optimization, visualization, and direct-to-stakeholder communications

PhD Student (Operations Research) - *University of Tours, France* - **JAN 2017 - MAY 2020**
- Formulate, build, and solve mathematical models representing transportation and logistics systems under uncertainty, especially in the context of electric vehicles
- Design and implement optimization solution methods, including exact solutions using commercial solvers, heuristic-based dynamic policies, and dynamic agents trained via deep reinforcement learning (AI) with artificial neural networks
- Generate simulations to assess performance of proposed realtime optimization methods
- Develop and maintain Java and Python codebases on GitHub

Co-advisor & Visiting Doctoral Researcher - *CIRRELT, HEC Montréal* - **SPRING 2019**
- Hire, advise, and manage intern investigating the adaptation of classical transportation problems for machine-learning-based solutions

Graduate Researcher & Teaching Asst. *- University of Washington -* **SEP 2013 - DEC 2016**
- Build optimization models to identify efficient forestry operations under climate change
- Develop solver for multi-objective optimization problems using CPLEX and Java
- Design interactive web-based visualization of optimization solutions using JavaScript (D3)
- Teach and write material for technical problem-solving labs for graduate-level operations research course "Optimization Techniques for Natural Resources"

Telecom Design Engineer *- Sprint, Overland Park, KS -* **JUL 2011 - AUG 2013**
- Design and lead experiments for telecom equipment; analyze and present results
- Perform quantitative mathematical analysis of potential sources of RF interference

SELECTED PUBLICATIONS

Electric Vehicle Routing with Public Charging Stations
https://hal.archives-ouvertes.fr/hal-01928730 (accepted in ***Transportation Science***)

frvcpy: An Open-Source Solver for the Fixed Route Vehicle Charging Problem
https://hal.archives-ouvertes.fr/hal-02496381 (accepted in ***INFORMS Journal on Computing***)

Dynamic Ridehailing with Electric Vehicles
https://hal.archives-ouvertes.fr/hal-02463422 (accepted in ***Transportation Science***)

Atari-fying the Vehicle Routing Problem with Stochastic Service Requests
https://arxiv.org/abs/1911.05922

SELECTED PATENTS

US Pat. 9,094,814 *- Provision of relay operation information to a wireless communication network*

US Pat. 20,140,321,367/European Pat. 2989852 *- Wireless communication system with multiple Device-to-Device communication configurations*

ACTIVITIES & SERVICE

Design vehicle routing software for coffee roaster and distributor Cafe Che Che.

Build HIV vaccine efficacy visualization with Fred Hutch Cancer Research Center

Referee for Transportation Science, Transportation Research: Part C, and International Transactions in Operational Research

Develop mapping utility for the vehicle routing community (VRP-REP)

Create open source Python solver for electric vehicle charging problems

Serve as student-faculty liaison for hiring of quantitative faculty member in UW's College of the Environment