Nicholas Kullman

Operations Research Data Scientist @ Facebook

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SUMMARY

- Experienced (7+ 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**
- Lead operations research efforts on Advanced Analytics team
- Support analytics requests across global business operations, leveraging operations research, machine learning, and data science
- Provide end-to-end project support: problem formulation, modeling, querying & 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

Organizer for the DIMACS Vehicle Routing Implementation Challenge

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