Nicholas Kullman

Research Scientist @ Amazon
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SUMMARY

- Experienced (9+ 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: Award-winning PhD in Operations Research, BS in 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*
  - Awarded national prize for best PhD in transportation research (Prix de thèse GT2L 2021)
- **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

Research Scientist - *Amazon* - **JUN 2021 - PRESENT**

- Lead researcher and developer for linehaul scheduling optimization software, driving scheduling improvements worth over $50MM

Operations Research & Data Scientist - *Facebook* - **MAY 2020 - JUN 2021**

- 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 via the Java API
- 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 (published in ***Transportation Science***)

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

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 of the DIMACS Vehicle Routing Implementation Challenge

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

Create open source Python solver for electric vehicle charging problems

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 instance visualization utility for the vehicle routing community (VRP-REP)