

# Nicholas Kullman

## Operations Research PhD Student

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## SUMMARY

- Experienced (5+ yrs) in operations research, machine learning, and analytics: optimization; simulation; math programming; deep reinforcement learning (artificial intelligence); data visualization, manipulation, and analysis
- Innovative: author of 25+ patents
- Strong quantitative skills: Operations Research PhD, QERM MS, Physics BS
- Competent programmer: Python, Java, Gurobi, JavaScript, D3, ArcGIS, CPLEX
- Fast learner, effective problem solver and communicator; can adapt and collaborate

## SELECTED EXPERIENCE

### **Doctoral Researcher** - *University of Tours, France* - JAN 2017 - PRESENT

- Formulate, build, and solve quantitative 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 Gurobi commercial solver, heuristic-based dynamic policies, and dynamic agents trained via deep reinforcement learning with artificial neural networks
- Create computer simulations to assess decision-making of dynamic policies and agents
- Develop and maintain Java and Python codebases on GitHub

### **Co-advisor & Visiting Doctoral Researcher** - *CIRRELT, HEC Montréal* - SPRING 2019

- Hire, advise, and manage masters student intern investigating the adaptation of classical transportation problem models for machine-learning-based solutions

### **MS Researcher & Teaching Asst.** - *University of Washington* - SEP 2013 - DEC 2016

- Build linear and nonlinear mathematical optimization models to identify efficient forestry operations in the context of climate change
- Develop solver for multi-objective optimization problems using CPLEX and Java
- Design interactive web-based visualization of optimization solutions using JavaScript (D3)
- Design material for, teach, and grade problem-solving labs for graduate-level 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
- Quantitative mathematical analysis of potential sources of RF interference

## SELECTED PUBLICATIONS

**Atari-fying the Vehicle Routing Problem with Stochastic Service Requests**

<https://arxiv.org/abs/1911.05922>

**Dynamic Ridehailing with Electric Vehicles**

<https://hal.archives-ouvertes.fr/hal-02463422>

**Electric Vehicle Routing with Public Charging Stations**

<https://hal.archives-ouvertes.fr/hal-01928730>

**frvcpy: An Open-Source Solver for the Fixed Route Vehicle Charging Problem**

<http://goodson.slu.edu/papers/frvcpy.pdf>

## 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

Build HIV [vaccine efficacy visualization](#) with Fred Hutch Cancer Research Center

Develop [mapping utility](#) for the Vehicle Routing Problem Repository ([VRP-REP](#))

Create [open source Python solver](#) for electric vehicle charging problems

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

## EDUCATION

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

JAN 2017 - APR 2020

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

SEP 2013 - DEC 2016

**BS Physics, minor in mathematics** - University of Missouri, Columbia, MO

AUG 2007 - MAY 2011

- Phi Beta Kappa, Departmental Honors, Summa Cum Laude, 3.98 GPA