

# NICHOLAS KULLMAN

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## SUMMARY OF QUALIFICATIONS

- OR experience – vehicle-routing internship, thesis in multi-objective optimization
- Strong quantitative skills – B.S. in Physics (3.98 GPA), finishing M.S. in QERM
- Innovative – 15+ patents, plus contributions to a variety of technical projects
- Fast-learner; effective problem solver and communicator; able to adapt and collaborate
- Computer programming – Java, Python, D3, CPLEX, JavaScript, ArcGIS, HTML, R

## EDUCATION

### **POLYTECH TOURS – PH.D. COMPUTER SCIENCE; SPECIALITY: OPERATIONS RESEARCH (CURRENT)**

Dissertation topic: Electric Vehicle Routing Optimization

### **UNIVERSITY OF WASHINGTON – M.S. QUANTITATIVE ECOLOGY & RESOURCE MANAGEMENT (2016)**

Thesis title: *Quantifying Conflict Among Competing Objective Functions in Multi-Objective Optimization*

### **UNIVERSITY OF MISSOURI – B.S. PHYSICS (2011)**

Graduated Phi Beta Kappa with departmental and Latin honors (summa cum laude, 3.98 GPA). Minor in mathematics. Semester abroad: Barcelona, Spain. Foreign language: Spanish

## SELECTED ACADEMIC EXPERIENCE

### **RESEARCH INTERN – ELECTRIC VEHICLE ROUTING OPTIMIZATION, POLYTECH TOURS (2016)**

**Optimized** routing of electric vehicles using stochastic dynamic programming.

**Formulated** model and model assumptions and simulated queuing processes.

**Developed** and maintained project's Java codebase on GitHub.

### **GRADUATE RESEARCH ASSISTANT – UNIVERSITY OF WASHINGTON (2013-2016)**

**Established** framework for the quantification of conflict among competing objective functions in multi-objective optimization.

**Quantified** risk of climate change destabilizing tradeoff relationships between ecosystem services in the Deschutes National Forest using multi-objective mixed-integer programs.

**Developed** user-friendly software to solve multi-objective optimization problems using IBM's CPLEX optimizer and its Java Concert Technology.

**Designed** web-based interactive visualizations of optimization results using Javascript library D3.

### **GRADUATE TEACHING ASSISTANT – UNIVERSITY OF WASHINGTON (SPRING 2016)**

**Created** and taught labs for SEFS 540 - *Optimization Techniques for Natural Resources*.

### **UNDERGRADUATE TEACHING ASSISTANT – UNIVERSITY OF MISSOURI (AUTUMNS 2009, 2010)**

**Led** problem solving and discussion sections for undergraduate physics sequence.

### **NSF REU RESEARCH ASSISTANT – UNIVERSITY OF CALIFORNIA, DAVIS (SUMMER 2010)**

**Determined** the non-existence of exoplanets around dwarf stars using the transit method.

## SELECTED PRESENTATIONS

*"Electric vehicle routing with mid-route recharging and uncertain charging station availability"* — **INFORMS Annual Meeting 2016** (11/13/2016)

	<p><i>"Quantifying conflict between competing forest ecosystem services under alternative climate scenarios"</i> — <b>INFORMS Annual Meeting 2016</b> (11/16/2016)</p> <p><i>"Impacts of climate change on conflict among forest ecosystem services"</i> — <b>Precision Forestry Cooperative Annual Board Meeting 2016</b> (10/20/2016)</p> <p><i>"Measuring conflict: Computing the hypervolume of a pareto frontier"</i> — <b>Guest lecturer: Optimization Techniques for Natural Resources</b> (5/25/2016)</p> <p><i>"Multiobjective optimization &amp; the impacts of climate change on the joint provision of forest ecosystem services"</i> — <b>INFORMS Annual Meeting 2015</b> (11/3/2015)</p>
<p>SELECTED PROFESSIONAL EXPERIENCE</p>	<p><b>TELECOM DESIGN ENGINEER — SPRINT (2011-2013)</b></p> <p><b>Served</b> as subject matter expert on the use of bi-directional amplifiers in LTE networks.</p> <p><b>Designed</b> and led product testing for site-level telecom equipment.</p> <p><b>Mitigated</b> threats from intermodulation through quantitative analysis of unstable frequency combinations.</p>
<p>SELECTED PATENTS</p>	<p><b>US Pat. 8,896,497:</b> Communications-tower antenna mount</p> <p><b>US Pat. 8,897,383:</b> Enhanced multipath environments for MIMO wireless networks</p> <p><b>US Pat. 20,140,321,367; European Pat. EP 2989852:</b> Wireless communication system with multiple Device-to-Device (D2D) communication configurations</p> <p><b>US Pat. 9,445,389:</b> Utilization of relay nodes with beamformed communications</p> <p><b>US Pat. 9,319,991:</b> Dynamically adjusting power settings based on a gain mapping file</p> <p><b>US Pat. 9,288,711:</b> Systems and methods for dynamically adjusting drop-timer thresholds based on loading</p>
<p>COMMUNITY INVOLVEMENT</p>	<p><b>Uptown Alliance</b> - Transportation committee, Parks committee</p> <p><b>US Dept. of Transportation's Beyond Traffic Forum</b> - volunteer</p>