KLAAS FIETE KRUTEIN, PH.D.

Operations Research and Data Scientist

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github.com/singfie 🌐 singfie.github.io

EXPERIENCE

Operations Research Scientist
Convoy, Inc.

📅 Aug 2022 - Ongoing 📍 Seattle, WA

Research Associate
University of Washington – Supply Chain Transportation & Logistics

📅 Jun 2019 – Ongoing 📍 Seattle, WA

- Led collaboration with Municipality of Bowen Island in Canada and coordinated team of 2 people to develop evacuation plan.
- Slashed estimated evacuation time of isolated communities by 70% through mixed-integer stochastic optimization model, solved through meta-heuristics.
- Reduced route time for commercial trucks by 7% through combined OD-matrix estimation and route optimization framework that incorporates expected parking delays into vehicle routing.
- Developed demand-driven mixed integer model to optimize the location of commercial vehicle loading zones in urban areas.

Research Scientist 2 Intern
Amazon, Inc.

📅 Jun 2021 - Sep 2021 📍 Bellevue, WA

- Improved expected resource planning cost for trucks by approx. 15% through routing-based resource optimization model using robust optimization and column-generation decomposition techniques in nationwide logistic network.
- Reduced manual adjustments in resource planning process by approx. 60% through flexible block-based resource planning tool.

Research Scientist Intern
Amazon, Inc.

📅 Jun 2020 - Sep 2020 📍 Seattle, WA

- Saved $26M in fixed costs per year in North American middle mile logistics network through combined planning and routing of multiple value streams with a shared equipment fleet.
- Reduced analysis time for equipment rightsizing and combined routing simulation from approx. 3 months to 12 hours of analysis time by leveraging big data warehousing, parallel computing and data pipeline integration.

Research Associate
University of Washington – Dep. of Industrial Engineering

📅 Sep 2018 - Jun 2019 📍 Seattle, WA

- Designed experiment, simulator set up, data collection, and analysis for a pilot workload study with flight simulator and developed systematic method for scenario selection.
- Developed a simulation model for investigating the effect of urban traffic density-based vehicle guidance systems on traffic flow.

SUMMARY

Operations research professional with **2 years** of industry work experience and **4 years** of academic research experience specializing in optimization modeling and data science.

MOST PROUD OF

🏆 **Research Output**
that is directly applied and helps organizations and people

📈 **Personal Growth**
experienced through balancing technical skills with project leadership and interdisciplinary collaboration to maximize impact of the dissertation project

STRENGTHS

Innovator | Team Worker | Leader
Problem Solver | Never Give Up Mentality

Optimization | Machine Learning
Simulation | Experiments | Statistics
Data Visualization | Cloud Computing
Linear & Non-Linear Programming

PROGRAMMING & TOOLS

Python	●●●●○
SQL	●●●○○
R	●●●○○
Java	●●●○○
Unix Bash	●●●○○

Pandas	●●●●●
NumPy	●●●●●
Scikit-learn	●●●●○
Pyomo	●●●●●
Dplyr	●●●●○
Ggplot2	●●●●○
Shiny	●●●●○
AWS	●●●●○
Gurobi/CPLEX/Xpress	●●●●●
Git	●●●●○

LEADERSHIP SKILLS

Teamwork	●●●●●

Material Planner Intern

Tesla, Inc.

📅 Jun 2018 - Sep 2018   📍 Reno, NV

- Reduced number of missing parts in warehouse by 10% through statistical data analysis and machine learning model to identify causes of missing parts and predict inventory shortage.
- Streamlined cross-functional processes for improved material and information flow between three business units.

Supply Chain Improvement Manager

Airbus Operations GmbH

📅 Oct 2016 - Sep 2017   📍 Hamburg, Germany

- Reduced inventory capital tie-up by $100M through data-driven target-setting process for optimized inventory levels.
- Collaborated with Business Transformation Director on 5 year road map for improved supply chain, and managed the resulting project portfolio.

Co-op Rotational Internship Program

Airbus Operations GmbH

📅 Aug 2013 - Oct 2016   📍 Hamburg, Germany

- Completed project-based engineering internships in engineering, production, supply chain, and quality departments.

PUBLICATIONS

📄 Journal Articles

- Dalla Chiara, G., Krutein, K., Ranjbari, A., & Goodchild, A. (2022). Providing curb availability information to delivery drivers reduces cruising for parking. *Under Review at: Nature Scientific Reports*.
- Krutein, K., Chiara, G. D., Dimitrov, T., & Goodchild, A. (2022). Improving commercial vehicle routing through the consideration of cruising for parking. *Under Review at: Transportation Research Part C: Emerging Technologies*.
- Krutein, K., & Goodchild, A. (2022). The isolated community evacuation problem with mixed integer programming. *Transportation Research Part E: Logistics & Transportation Review*, *161*(102710). doi:https://doi.org/10.1016/j.tre.2022.102710
- Krutein, K., Goodchild, A., & Boyle, L. (2022b). Robust and rolling horizon optimization approaches for handling uncertainty in the isolated community evacuation problem during emergency response. *Under Review at: Transportation Science*.
- Krutein, K., McGowan, J., & Goodchild, A. (2022). Evacuating isolated islands with marine resources: A bowen island case study. *International Journal of Disaster Risk Reduction*, *72*(102865). doi:https://doi.org/10.1016/j.ijdrr.2022.102865
- Dalla Chiara, G., Krutein, K., Ranjbari, A., & Goodchild, A. (2021). Commercial vehicle driver behaviors and decision making: Lessons learned from urban ridealongs. *Transportation Research Record: Journal of the Transportation Research Board*, *2675*, 608–619. doi:https://doi.org/10.1177/03611981211003575
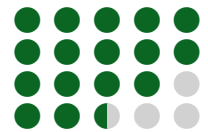
👥 Conference Proceedings

Organization
Initiative
Decision Making
Innovation
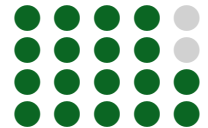
LANGUAGES

English
German
French
Spanish

EDUCATION

Ph.D. in Industrial Engineering

University of Washington

📅 2019 – 2022   📍 Seattle, WA

Dissertation: Optimization Modeling Approaches to Evacuations of Isolated Communities

M.S. in Industrial Engineering

University of Washington

📅 2017 – 2019   📍 Seattle, WA

B.Sc. in Industrial Engineering & Business Management

FH Nordakademie (University of Applied Sciences Nordakademie)

📅 2013 – 2017   📍 Elmshorn, Germany

Thesis: Framework for a Stock Opt. Strategy

Certificate of Proficiency in Industrial Engineering

University of Auckland

📅 2015 – 2016   📍 Auckland, New Zealand

AWARDS

Fellowship for High Potentials

Foundation of German Business (SDW)

📅 2013 – 2019

Fellowship for Graduate Studies Abroad

German Academic Exchange Service (DAAD)

📅 2017 – 2019

Fellowship for International Exchange

Institute Ranke Heinemann

📅 2015

- Krutein, K., Goodchild, A., & Boyle, L. (2022a). A meta-heuristic solution approach to isolated evacuation problems, Proceedings of the 2022 Winter Simulation Conference.
- Krutein, K., & Boyle, L. (2019). Systematic approach for the design of flight simulator studies. (Vol. 63, pp. 833–837). doi:https://doi.org/10.1177/1071181319631524