KLAAS FIETE KRUTEIN, PH.D.

Operations Research and Applied Scientist

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EXPERIENCE

Operations Research Scientist

Convoy, Inc.

Aug 2022 - Ongoing | Seattle, WA

- Led the design of novel routing algorithm for maximizing utilization of time-based contracts.
- Drove strategic planning of new product ideas from a science perspective.

Research Associate

University of Washington – Supply Chain Transportation & Logistics

Jun 2019 – Jun 2022 | 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

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	●●●●●

- 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.

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.

PUBLICATIONS

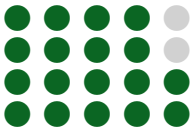
Journal Articles

- Dalla Chiara, G., Krutein, K., Ranjbari, A., & Goodchild, A. (2022). Providing curb availability information to delivery drivers reduces cruising for parking. *Scientific Reports*. doi:https://doi.org/10.1038/s41598-022-23987-z
- Krutein, K., Dalla Chiara, G., Dimitrov, T., & Goodchild, A. (2022). Improving commercial vehicle routing through the consideration of cruising for parking. *Available at SSRN*. retrieved from https://ssrn.com/abstract=4183322
- 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*.
- 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

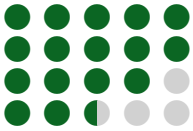
- Krutein, K., Goodchild, A., & Boyle, L. (2022a). A meta-heuristic solution approach to isolated evacuation problems, Proceedings of the 2022 Winter Simulation Conference.

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., & Boyle, L. (2019). Systematic approach for the design of flight simulator studies. (Vol. 63, pp. 833–837). doi:https://doi.org/10.1177/1071181319631524