At the Chair of Logistics and Supply Chain Management of TUM School of Management, we are looking for an interested and qualified student to conduct his/her

Master Thesis/Project Study/IDP

on the topic

Optimize Sustainable Logistics Algorithms (OLA) in the End-2-End Agriculture Supply Chain

KIREAP

Introduction to KIREAP

KIREAP is a social impact start-up with a mission to democratize and digitalize the end-to-end agriculture value chain, from demand to delivery. We provide an integrated supply chain platform that connects producers (farmers) directly with off-takers. Our platform incorporates innovative solutions such as blockchain-based traceability, automated logistics optimization, demand-supply matching, and future-focused remote-sensing-supported yield prediction.

Optimized Logistics Algorithm to achieve sustainability

A cornerstone of our solution is optimizing transport and logistics in an environmentally sustainable way. Our platform leverages advanced logistics optimization models to enhance route planning by analyzing multiple parameters, including quantity, time, cost, capacity, transport type, and distance, alongside environmental factors such as greenhouse gas (GHG) emissions and traffic congestion. These dynamic models enable adaptive and efficient logistics solutions tailored to evolving needs. The primary objectives are to minimize delivery costs and time, maximize truck capacity utilization, and enable efficient fleet management with minimal delays. However, key sustainability parameters shall be included in future models. Future models should also be able to run on Quantum infrastructure.

Key project tasks:

- Analyze Kireap's current logistics processes and identify data requirements.
- Collect, clean, and prepare data for modeling purposes.
- Develop the optimization algorithms and integrate into Kireap’s digital platform.
- Improve the performance of the algorithms and test the applicability of the algorithms in different scenarios.
- Evaluate the outputs by comparing them with real logistics operation data.
- Explore impact of quantum computing requirements

Requirements:

The project study is suitable for Bachelor's or Master's students in relevant fields. Candidates are expected to have strong analytical and business skills, along with the ability to work independently and proactively. A solid understanding of mathematical modeling and optimization techniques is essential, and prior experience in applying these techniques to real-world problems is highly preferred. Additionally, excellent communication and collaboration skills are required to effectively engage with the team. A basic understanding of sustainable supply chain and logistics principles would be considered an advantage.

Earliest begin: as soon as possible

Supervisor: tbd

Application: Email with curriculum vitae and transcript of records to logtheses.log@mgt.tum.de

Information: https://kireap.com