Fleet Design for On-Demand Last-Mile Logistics

MSc. Project Proposal at the Autonomous Multi-Robots Lab, Cognitive Robotics, TU Delft

Brief description:

The desire of customers for faster and more reliable home deliveries is increasing strongly. At the same time, fleets of automated on-demand vehicles have the potential to disrupt urban commerce by providing last-mile delivery faster and cheaper than currently established traditional delivery channels. Yet to meet the challenging expectations of customers and fully utilize the benefits of such large-scale multi-robot systems, novel approaches for routing are developed. Additionally, the physical set up of such operations needs to be optimized to provide best starting-conditions on a day-to-day basis.

Within this project we will combine two state-of-the-art methods to do fleet design for an on-demand last-mile delivery problem. This project will build on an adaption of the routing method VGA, developed by Alonso-Mora et. al. [1]. We aim to combine it with current ideas in fleet design.

Desired qualities:
  - Motivated and independent
  - Good problem solving skills
  - Experience/interest in vehicle routing problems
  - Good experience in C++ or python programming

For further questions or to apply, please contact M.Kronmueller <m.kronmuller@tudelft.nl> or Ass. Prof. Dr. J. Alonso-Mora <j.alonsomora@tudelft.nl>. When applying, please provide a short motivation, up to date CV, a transcript of your current degree program and intended start date.

Group information: http://www.autonomousrobots.nl/

References:

J. Alonso-Mora, S. Samaranayake, A. Wallar, E. Frazzoli, D. Rus, **"On-demand High-capacity Ride-sharing via Dynamic Trip-Vehicle Assignment"**, in Proceedings of the National Academy of Sciences of the USAZ (PNAS), vol. 114, no. 3, pp. 462-467, Jan. 2017