NXT22-018 - Knowledge Graph-driven Tour Management for Sustainable Waste Processing

Abstract

Achieving a circular economy is one of the most critical ingredients of a sustainable economy and society. Recycling and waste processing is one of the lynchpins for achieving this goal. In this project, we will use Knowledge Graph-based methods to improve a key part of this recycling process, namely collecting organic waste: In our new target group for the transfer project, mobile devices capture images and metadata within a truck collecting organic waste. Selected materials and items are then identified by a neural network while a garbage bin is being purged. The goal in this transfer project is to improve tour management so that optimized tours with similar types of waste can be computed automatically. In particular, we are interested in splitting tours into “red”-tours which frequently collect harmful materials mixed into organic waste, and which have to be separated manually and “green” tours, which mainly collect pure organic waste. This helps improve the circular economy and CO2 emissions (less waste has to be burned, more is composted and reused). The method we will apply for this are knowledge graphs (developed in our WWTF VRG) on top of the collected information to identify and optimize (geographically and temporally) tours for the trucks regarding waste content. Furthermore, we study the derived metrics of waste composition for detecting patterns over time at specific locations. This provides the partners the possibility to use targeted information material depending on the detected waste and provides us the possibility to analyze the effect of the campaign.

Keywords:
sustainability, waste management, tour management, knowledge graphs, CO2 reduction

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Further links to the persons involved and to the project can be found under
https://www.wwtf.at/funding/programmes/ei/NXT22-018/