Craft #LikeABosch
online hackathon

Innovation challenge

Introduction

The parking situation in the centre of Budapest is not easy. Narrow one-way streets and heavy through traffic, lots of local services and shops mean lots of parked cars, and often even residents can't find a free parking space close to their homes. The challenge is to help the parking situation in the city centre - by building a community parking system.

Conditions

For the sake of simplicity, the task is limited to the area of District V - you can use any legally available map or database (e.g., OpenStreetMap) to perform the task.

Assume that parking is possible on all roads and streets that are not currently closed to traffic, as well as on both sides of the road, but the direction of entry must be considered when finding and leaving a parking space! All parking spaces have a fixed position/status "occupied" or "free".

Vehicles can enter the district on all roads leading inwards in terms of entry direction and can exit according to a similar logic. It is recommended to look for a map where the direction of travel is indicated plus roads closed due to traffic are marked. If not, these can be randomly generated, just make sure that you can get to (nearly) everywhere.

The purpose of traffic can be divided into three groups in terms of parking:
 • Passing vehicle, does not want to park.
 • Vehicle intending to park
 • Vehicle leaving a parking space

In addition to the things listed above, all vehicles can be divided into two further categories:
 • It has a community parking system
 • Does not have community parking system

A vehicle that owns a community parking system is a vehicle that:
 • has the ability to detect the status of a parking space (after passing it) and communicate this to other vehicles using the system
 • is able to receive and process information about available parking spaces

These vehicles take up 35% of the total number of vehicles in the district. The other vehicles can only park where and when they find a free space. For the sake of simplicity, cars are not allowed to collide at intersections, they pass each other when they meet.

The challenge

The task is the implementation of the community parking system application itself, and a simulation capable of simulating the movement of vehicles, finding parking spaces, parking in and out.

All vehicles that enter (except those that just drive through the district) "travel" to a random destination and look for the most ideal parking place, once they find it, they spend a random amount of time there, then leave the parking place and the district.

The aim of the task is to show that using the community parking system is a more efficient way to find the most ideal parking space concerning the destination.

Evaluation criteria

- Efficiency of parking information communication (topology, data volume, structure, etc.)
- Demonstrate why parking is easier with the parking assistance application, possibly justifying it with numbers
- Efficiency of offering free parking spaces (e.g., which of two free spaces is better, or which of two vehicles gets it if there is only one free space?)
- Traffic simulation