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| 1. **Name of the challenge** *(short, powerful and inspiring description):*

 **Smart mobility – analysis of behavior of vehicles within the town limits** |
| 1. **Context*:*** *(what is the background information behind the challenge, what is the state of the art of the sectors, the role of the organization in this context, the target group to whom the solution need to be addressed, etc.)*

 The objective is to develop a vehicle monitoring system within town quarters using the camera technology - edge computing (computing directly on the end devices), machine learning and an IoT platform. The purpose of the system will be recording and evaluation of information on behavior of vehicles in the area monitored and help optimize the traffic, e.g. by identification of „peak hours“ based on the time of vehicle queuing or detection of drive-in of unauthorized vehicle in a monitored area.. |
| 1. **Problem:** (*What i*s *the problem that needs to be solved, why is important to solve, impact of this problem in the close future, impact of the problem on local or international area)*

● Vehicle recording and identification using camera. First a suitable hardware that enables work with video and evaluation of the recorded images directly in the device will be selected. Then machine learning, specifically image processing libraries ( e.g. TensorFlow or OpenCV) will be utilized for vehicle detection (vehicle type, anonymized tagging using the hash of vehicle) and finally for detection of repeated occurences. ● Processing and visualisation of recorded data. 1. **Additional info (for internal use):**  *(what is expected to be delivered by the team (idea/concept/prototype), what are the specific tools & instruments that shall be used (eg. Programing language etc), what are the asset (as knowledge, materials) will be given to the team*

Possible extension of project scope: ● Integration of data and solution to the SmartParking product zaparkuj.to ● Use of machine learning on the data acquired in order to develop models of traffic load in the streets, identification of repeated patterns, e.g. whether the trash disposal cars operate in a suitable time, etc. |
| 1. **Skills of the team (for internal use):** *what specific skills shall the team have in order to address the challenge*

Python, Java or other programming language with libraries for machine learning and image processing, frontend (HTML, CSS, JavaScript, React, Google Maps, HERE Maps), IoT LoRa - platform Live Objects. Useful knowledge fields: Knowledge discovery, Computer vision, Information retrieval, Data visualization. |
| **5. About the Seeker:****Unicorn Systems SK s.r.o.** is a software development company with long experience in forecasting solutions, especially in the field of energetics. It now seeks to utilize the forecasting know-how in other domains. **Orange Slovakia, a.s.** will help in selection of hardware and software for the project. Mentor: Ing. Ivan Srba, PhD. |