Quickpark – Open, Cost-Effective System Conveniently Automating Parking Security

Abstract

Managing vehicle parking areas requires significant error-free human effort, and has historically been a problem picked up only by expensive, proprietary, always-online solutions. Many small organizations cannot afford such expensive solutions. Trusting remote servers with physical security is a great risk even for large organizations. Coming last in this chain, consumers too, face issues - e.g. with digital privacy - when using such proprietary software. In this paper, we propose *Quickpark* – an open, libré, and cheap solution with the ability to oppose said exorbitant expenses, remote reliance, and privacy problems. We then discuss the development of a prototype of *Quickpark Unit* for a single vehicle. This involves the ESP-IDF SDK, Python, OpenCV, MariaDB, and many other well-known open-source, freely-accessible technologies. Vehicle-detection mechanisms via weight and vision shall be explained, as well as the use of computer vision to parse vehicle ID, and optimize the *Quickpark Unit's* power usage. Finally, we show the network architecture and server-side setups, which aim to be hosted on security infrastructure owned by the organization aiming to integrate *Quickpark*.