

# CampusSense - A Smart Vehicle Parking Monitoring and Management System using ANPR Cameras and Android Phones

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**Abstract--** Vehicle parking monitoring and management has become a big challenge for educational institutions with increasing enrollments, high percentage of vehicle ownership and decreasing parking supply which in result triggering blockage of vehicle, congestion, wastage of time and money. In university campuses particularly in Kingdom of Saudi Arabia, vehicle parking monitoring and management problem is getting worse and more frustrating due to the fact that majority of students, faculty and staff members own cars and drive through them to the university campuses. These common problems include finding out people (evidence) who are responsible for the damages (hitting, scraping, scratching and dents) to other cars and the blockage of car due to wrong car parking which takes much time to locate the owner of the car. Moreover, locating or forgetting their car park location another difficulty that is often faced by the students, faculty and staff members. The existing cameras located at the parking lots are only for video surveillance and cannot help in such situations as there is a lack of proper vehicle parking monitoring and management system. To cope with above mentioned problems and to ensure a better parking experience by accommodating increasing number of vehicles in a proper convenient manner, we propose a smart vehicle parking monitoring and management system called CampusSense. In CampusSense, Automatic Number Plate Recognition (ANPR) cameras and android based mobile application is developed to efficiently monitor, manage and protect the parking facilities at university campuses. Parking problems around the university campus faced by the students, faculty and staff members are analyzed by conducting a survey.

**Keywords—**Smart Vehicle Parking Monitoring and Management, Android based Mobile Phones, License Plat Recognition, Locating Vehicle, Mobile Sensing.



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