

Implementation of an IoT-Based Smart Parking System with Real Time Vehicle Position Tracking and Auto Billing App

Wasalathanthree, D.V.^{1*}, Wickramasinghe, H.A.K.V.¹, Thilakasiri, W.P.M.¹, Jayasooriya, L.T.¹

¹*Department of Electrical & Electronic Technology, Faculty of Technology,
Rajarata University of Sri Lanka.*

**ent1718095@tec.rjt.ac.lk*

In our quest for innovation, we've crafted an IoT-based Smart Parking System designed to overcome the hurdles ingrained in traditional urban parking setups. By prioritizing enhanced parking space utilization, reduced search times, and simplified payment processes, our system integrates real-time vehicle tracking and an auto billing app. This strategic fusion of *IoT* technology and mobile applications aims to uplift the overall efficiency of parking management, offering users unparalleled convenience and an elevated experience. Urban parking systems, burdened by space constraints, manual ticketing, and complex payment procedures, often result in traffic congestion and user dissatisfaction. Our research charts a transformative path, leveraging IoT infrastructure and wireless communication to propose a solution that transcends the limitations of conventional setups. The project's comprehensive methodology, involving a sophisticated IoT infrastructure, *IR sensors*, *Node MCU ESP8266*, and a user-friendly mobile app, culminates in a robust system proficient in detecting parking space occupancy, providing real-time tracking, and automating billing processes seamlessly. The integration of high-quality IR sensors ensures precision, and the Node MCU brings efficiency through wireless connectivity. The tangible outcomes underscore improved parking efficiency, reduced traffic congestion, and heightened user satisfaction, marking a successful stride toward a more sustainable and user-centric urban mobility landscape.

Keywords: *Internet of Things; Smart Parking System; Strategic fusion; Traffic congestion*