

IoT and Traffic

This report reviews six research papers exploring the application of Internet of Things (IoT) technologies in optimizing traffic management systems

Literature Review

Paper 1

Title: IoT in Traffic Management: A Review of Existing Methods for Road Traffic Regulation By : Dmitry Elkin , Valeriy Vyatkin, 2020

Summary: This paper provides a broad overview of current traffic management approaches and the potential of IoT for real-time data collection and dynamic control

Analysis: While this paper offers a foundational understanding, a more detailed analysis of specific IoT applications would be valuable . The content of the paper is mostly theoretical and not practical

Paper 2

Title: PrePCT: Traffic Congestion Prediction in Smart Cities with Relative Position Congestion Tensor By Mengting Bai , Yangxin Lin and Meng ma 2020

Summary: This paper focuses on PrePCT, a machine learning technique for predicting traffic congestion in smart cities. It likely explores how the model utilizes data on relative positions within the traffic network for improved .accuracy

Analysis: This paper delves into a specific prediction technique. Examining its effectiveness compared to other methods and potential data quality .limitations would be beneficial

It is also limited to predicting congestion and does not discuss a radical solution to it

Paper 3

Title: Smart Traffic Management System Using Deep Learning for Smart City Applications By GM Lingani, DB Rawat, and M Garuba 2019

Summary: This paper investigates deep learning for developing a smart traffic management system. It might explore how deep learning algorithms can analyze traffic data and optimize traffic light timings for improved flow

Analysis: This paper explores a promising approach. Analyzing the specific deep learning architecture, training data, and potential computational demands would provide a deeper understanding

Paper 4

Title: Intelligent Traffic Control System: Towards Smart City By A Kumar, A. Roy, S. Roy, D. Chakraborty, and H.N. Saha 2019

Summary: This paper describes an intelligent traffic control system designed for smart cities. It might discuss the system components, data collection methods, and potential benefits for traffic management and overall smart city development

Analysis: Understanding the specific data sources, communication protocols, and security considerations of this system would be valuable

Paper 5

Title: Traffic Signal Control for Smart Cities Using Reinforcement Learning by Hyunjun Joo, Syed Hassan Ahmed, and Young-Man Lim 2020

Summary: This paper explores applying reinforcement learning for traffic signal control. Reinforcement learning algorithms can learn optimal strategies through trial and error, potentially leading to dynamic traffic light adjustments based on real-time traffic conditions

Analysis: This paper explores a promising approach for adaptive traffic control. Examining the specific reinforcement learning algorithm, reward function design, and potential limitations in real-world implementation would provide further insights

Paper 6

Title: Fuzzy Inference Enabled Deep Reinforcement Learning-Based Traffic Light Control for Intelligent Transportation Systems By Neetesh Kumar ,Syed Shameerur and Navin Dhakad

Summary: This study proposes a Dynamic and Intelligent Traffic Light Control System (DITLCS) for smart cities. DITLCS uses real-time traffic data to adjust light timings and prioritizes emergency vehicles. It also employs deep learning and fuzzy logic for optimal traffic flow

Analysis: The paper addresses limitations of fixed traffic light systems by dynamically adjusting lights based on real-time data. Combining deep learning and fuzzy logic offers a promising approach, but the effectiveness compared to other methods and real-world implementation considerations require further exploration

Title	Publication Year	Authors	Key Findings
IoT in Traffic Management: A Review of Existing Methods for Road Traffic	2020	Dmitry Elkin , Valeriy Vyatkin	IoT; traffic management; intelligent transportation system; ITS; traffic; traffic jam
PrePCT: Traffic Congestion Prediction in Smart Cities with Relative Position Congestion Tensor	2020	Mengting Bai , Yangxin Lin and Meng ma	Traffic congestion prediction using relative position data
Smart Traffic Management System Using Deep Learning for Smart City Applications	2019	GM Lingani, DB Rawat, and M Garuba	Deep learning for traffic data analysis and traffic light optimization , IOT
Intelligent Traffic Control System: Towards Smart City	2019	A Kumar, A. Roy, S. Roy, D. Chakraborty, and H.N. Saha	System components, data collection methods, and potential benefits
Traffic Signal Control for Smart Cities Using Reinforcement Learning	2020	Hyunjun Joo, Syed Hassan Ahmed, and Young-Man Lim	Reinforcement learning for dynamic traffic light adjustments
: Fuzzy Inference Enabled Deep Reinforcement Learning-Based Traffic Light Control	2020	Neetesh Kumar ,Syed Shameerur and Navin Dhakad	Hybrid approach for traffic light control combining deep learning and expert knowledge