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A Survey On Keen City Vehicle Positioning Inhabitance Tracking and Managing System

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ABSTRACT

Finding an available parking spot in a congested parking lot can be a daunting and time-consuming task, leading to frustration, traffic congestion, and increased environmental pollution. This problem is exacerbated in urban areas, where parking spaces are in high demand, and traditional methods of parking spot detection fall short in providing efficient solutions. To address this issue, we propose the development of a mobile application that leverages Machine Learning (ML) and Image Processing technologies to assist users in locating vacant parking slots within a specific area.

Our Keen City Vehicle Positioning Inhabitance Tracking And Managing System aims to revolutionize the parking experience by providing real-time information about available parking spaces. Through the use of cameras and image processing algorithms, the system continuously monitors the parking lot, identifying occupied and vacant spots. The mobile app, linked to this system, allows users to access up-to-date parking availability information, saving time and reducing the stress associated with parking.

Keywords : Machine learning, Deep learning , edge detection, coordinate bound pixels, image processing, Keen Parking, Parking space detection, Image Processing.

I. INTRODUCTION

Urbanization and the increasing number of vehicles on the road have led to a pressing problem in metropolitan areas worldwide— parking congestion. The struggle to find available parking spaces contributes significantly to traffic congestion, air pollution, and the overall stress experienced by urban commuters. In response to this challenge, modern technology, particularly computer vision and machine learning, offers a promising solution. Traditionally, parking management relied on manual checks or simple sensors, which often provided limited and inaccurate information regarding parking availability. In contrast, our proposed Keen City Vehicle Positioning Inhabitance Tracking and Managing System leverages real-time data collected from strategically positioned

cameras within parking lots and structures. These cameras capture images of parking spaces and feed them into a sophisticated image processing pipeline. The core of our system lies in machine learning and deep learning algorithms, which are employed to analyze these images. These algorithms can accurately detect the presence or absence of vehicles in each parking space, classify the types of vehicles, and even predict parking durations. By continuously processing this information, the system generates up-to-the-minute parking occupancy data. [2]

One of the notable advantages of our approach is its adaptability and scalability. The system can be easily customized to suit different types of parking facilities, from open lots to multi-story parking garages. Additionally, it can seamlessly integrate with mobile applications, websites, and electronic displays, allowing drivers to access real-time parking availability information on their smartphones or other devices. [4]

The benefits of the Keen City Vehicle Positioning Inhabitance Tracking and Managing System are manifold. By reducing the time and effort required to find parking, it helps alleviate traffic congestion, thereby decreasing fuel consumption and greenhouse gas emissions. Furthermore, it improves the overall driving experience by reducing the frustration associated with circling for parking spots. [1]

In this paper, we present a comprehensive overview of the Keen City Vehicle Positioning Inhabitance Tracking and Managing System, detailing its architecture, image processing techniques, and the machine learning models employed. We also report the results of extensive testing and evaluation, demonstrating the system's accuracy, efficiency, and real-world applicability [6]. Lots of IOT based technologies are used for advancement of safe, secure and smart travelling [8]. In an intelligent radio network and ANN, a new method is proposed that decides when to switch between stations. In this method, the WRAN cell is split into smaller parts called microcells. Each microcell has a different set of CPEs, and each CPE has been well trained with the help of fuzzy logic and ANN [9].

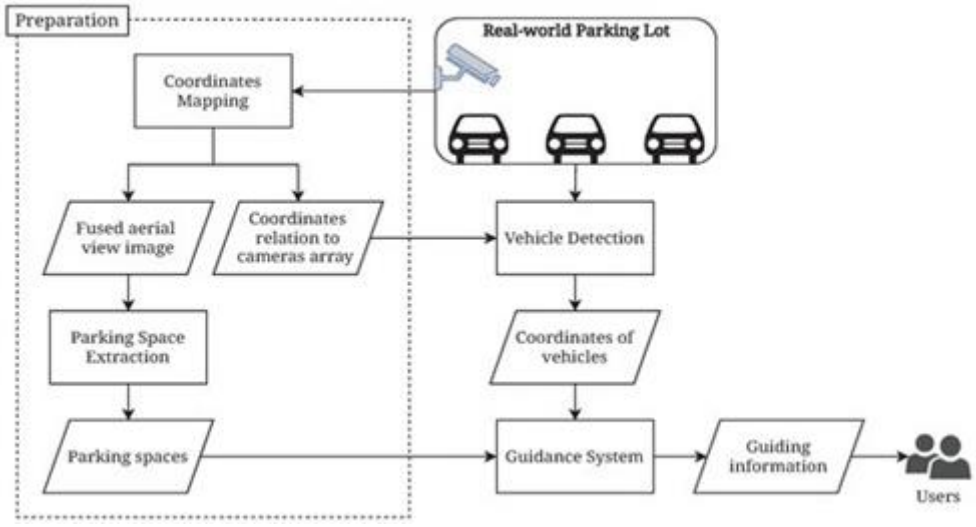

Fig 1. Overview of the system architecture.

II. LITERATURE SURVEY

"Smart way to automate the management of parking system for smart cities." Anuradha Jayakody, Karunanayake, 2021, Proper management of outdoor parking issue with an inefficient parking slot availability and occupancy. System uses a combination of Laplacian operator to edge and HAAR Cascade classifier for object identification

and motion tracking. The system proposes an effective methodology to check availability using a camera placed for a lamppost view.

"A Smart EcoSystem for Parking Detection Using Deep Learning and Big Data Analytics**"** Sai Nikhil Reddy Mettupally , Vineetha Menon**,** 2020**,** The primary focus of the work lies in reducing the model training time and outlining the classification model that is used to detect the vehicles**,** For this, we have designed a new FMRCNN model that detects multiple cars in an image.A mobile application on Android and iOS platforms could be developed displaying the realtime parking information.

"Smart Car Parking System using Convolutional Neural Network**"** Tom Thomas,Tarun Bhatt2018**,**During busy hours in the city finding a parking spot, becomes a tedious process.Convolutional Neural Network; Artificial Neural Network; Image Processing.The Neural Network; Artificial Neural Network; Image Processing. The overall aim was to develop an automatic system that counts the empty spaces in a parking lot, by giving the image of the parking lot as the input. The output will be obtained as a display on the output console.

"Car Detection in Roadside Parking for Smart Parking System Based on Image Processing**"** Deni Kristin Manase, Zahir Zainuddin 2020**,** detect vehicles that are on the side of the parking lot so that it can be used as a smart parking system for parking management and find out information on the availability of parking spaces**,** Haar Cascade Classifier, and YOLOv3 then compared them to get the best accuracy in detecting parked cars**,** Therefore, in order not to cause congestion and spend time searching for parking slots, management, and information about the availability of parking spaces on the roadside is very important for drivers and parking attendants to find out how long a parking vehicle is.

"Deep Learning Based On-Street Parking Spot Detection for Smart Cities**"** Dilan Fatma, Kemal Doruk 2020 , Finding a free on-street parking spot is an everyday chore for drivers in populated cities. The traditional method of circling around the parking lots or streets to find a spot (blind search) is inefficient, time consuming, and frustrating, It proposed system by describing the design and implementation of CNN, mobile, and server applications., Deep learning can be efficiently applied to the on-street parking management problem The server will be placed in the Cloud to make it accessible from anywhere. In addition, the mobile application will have an improved user interface such that user can choose the location or system selects the closest location .

"A Camera based Smart Parking System Employing Low complexity Deep Learning for Outdoor Environments**"** ChantriPolprasert, ChaiyaboonSruayiam2019**,** Traffic congestion has become one of the main problems in many big cities. Traffic jam contributes to many economic, environmental and social problems such as noise and air pollution.**,** Deep Neural Network, CNN, Smart Parking, Smart Camera, Machine Learning**,** Used to mitigate the traffic congestion problems by reducing time for drivers to look for vacancy positions in car parking lots and providing efficient parking space utilization.

"A Multistorey Garage Smart Parking System based on Image Processing**"** Chyn Ira C. Crisostomo, Royce Val C. Malalis2019**,** For multistorey parking garages. Car drivers spend a considerably long amount of time finding an available parking space where slots are spread throughout multiple stories which causes longer queues and traffic congestion**,** Python IDLE and the OpenCV library,Edge detection, coordinate bound pixels, image processing, multistorey parking**,** The system can be used to efficiently determine open parking spaces spread across multiple floors in indoor building garages without much added cost by utilizing surveillance camera feeds from each floor.

"An Edge Based Smart Parking Solution Using Camera Networks and Deep Learning**"** Harshitha Bura, Nathan Lin, Naveen Kumar, 2018**,** An increasing number of cities struggle with traffic congestion and inadequate parking availability. For urban dwellers, few things are more irritating than anxiously searching for a parking space**,** Deep learning, edge devices, smart cities, smart parking.System can automatically detect when a car enters the parking

space, the location of the parking spot, and precisely charge the parking fee and associate this with the license plate number.

"Implementation of an Image Processing based Smart Parking System using Haar Cascade Method" Muhammad Hakim, David Christover, Adi Mahmud Jaya Marindra, 2019, In highly populated cities, finding available car parking slots is time consuming and may cause severe traffic congestions at the parking entrance, Car detection, HaarCascade, image processing, internet of things, smart parking, A smart parking system with automated car detection is required so that the car drivers would have minimum effort and time to access the available parking location..

"Automatic Parking Space Detection System" Hassan Dawood, Nazia Bibi, 2017, Searching a suitable parking space in populated metropolitan city is extremely difficult for drivers. Serious traffic congestion may occur due to unavailable parking space., automatic parking; slot recognation; parking space detection; machine learning, Optimize the identification of available parking slots to possibly reduce the congestion in parking arena. Due to advancement in machine learning and vision base technology cost effective automatic parking systems facilitate the drivers to locate available spaces at parking arena.

III.LIMITATIONS OF EXISTING WORK

- Hardware and Infrastructure Requirements: One of the primary limitations of our system is its reliance on a network of cameras strategically placed throughout the parking facility. The deployment of such a network can be costly and may require significant infrastructure changes in existing parking facilities. Additionally, the maintenance of cameras and network connectivity presents ongoing operational expenses.
- Privacy Concerns: The use of cameras for continuous monitoring of parking spaces raises privacy concerns. While our system is designed to focus solely on vehicle detection and parking availability, it may inadvertently capture identifiable information about individuals, potentially infringing on privacy rights. Striking a balance between effective parking management and privacy protection is an ongoing challenge.
- Resource Intensity: The deployment of machine learning and deep learning models for real-time image processing requires significant computational resources. This can pose challenges for smaller parking facilities or those with limited access to high-performance computing infrastructure.
- Scalability: While we have designed our system to be scalable, scaling up to larger parking facilities or city-wide deployments may introduce complexities in data management, network bandwidth, and computational resources. Ensuring the system's seamless performance at scale is an ongoing research challenge.
- Maintenance and Calibration: Continuous maintenance and calibration of cameras and image processing algorithms are essential for the system's long-term reliability. Regular updates and monitoring are necessary to address changing conditions and improve accuracy.

IV.CONCLUSION

In this research paper, we have presented a comprehensive study on the development and implementation of a Keen City Vehicle Positioning Inhabitance Tracking And Managing System that harnesses the power of machine learning, deep learning, and image processing technologies. Our system has been designed to address the

persistent challenges associated with urban parking management by providing real-time information on parking spot availability, thereby improving the overall urban commuting experience.

our Keen City Vehicle Positioning Inhabitance Tracking And Managing System represents a significant step towards a more efficient and sustainable urban future. By leveraging machine learning, deep learning, and image processing, we have developed a solution that not only addresses the challenges of parking management but also contributes to the broader goals of reducing urban congestion and environmental impact. We look forward to the continued evolution of intelligent parking systems and their positive impact on urban mobility.

V. REFERENCES

[1]. J. A. R. Percastre and J. R. R. Cáceres, "Towards the design of interactions in an Smart Parking for people with disability," 2020 3rd International Conference of Inclusive Technology and Education (CONTIE), Baja California Sur, Mexico, 2020, pp. 84-88, doi: 10.1109/CONTIE51334.2020.00024.

[2]. D. K. Manase, Z. Zainuddin, S. Syarif and A. K. Jaya, "Car Detection in Roadside Parking for Smart Parking System Based on Image Processing," 2020 International Seminar on Intelligent Technology and Its Applications (ISITIA), Surabaya, Indonesia, 2020, pp. 194-198, doi: 10.1109/ISITIA49792.2020.9163744.

[3]. J. A. D. C. A. Jayakody, S. A. H. M. Karunanayake, E. M. C. S. Ekanayake, H. K. T. M. Dikkubura and L. A. I. M. Bandara, ""iParking" – Smart way to Automate the Management of the Parking System for a Smart City," 2020 2nd International Conference on Advancements in Computing (ICAC), Malabe, Sri Lanka, 2020, pp. 49-54, doi: 10.1109/ICAC51239.2020.9357140.

[4]. S. Lekshmi, P. Vijayan and B. Kurian, "Smart Parking System Based On Optical Character Recognition," 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), Tirunelveli, India, 2019, pp. 1184-1188, doi: 10.1109/ICOEI.2019.8862517.

[5]. Crisostomo, R. V. C. Malalis, R. S. Saysay and R. G. Baldovino, "A Multi-storey Garage Smart Parking System based on Image Processing," 2019 7th International Conference on Robot Intelligence Technology and Applications (RiTA), Daejeon, Korea (South), 2019, pp. 52-55, doi: 10.1109/RITAPP.2019.8932899.

[6]. F. Öncevarlıkl, K. D. Yıldız and S. Gören, "Deep Learning Based On-Street Parking Spot Detection for Smart Cities," 2019 4th International Conference on Computer Science and Engineering (UBMK), Samsun, Turkey, 2019, pp. 177-182, doi: 10.1109/UBMK.2019.8907006.

[7]. M. Hakim, D. Christover and A. M. Jaya Marindra, "Implementation of an Image Processing based Smart Parking System using Haar-Cascade Method," 2019 IEEE 9th Symposium on Computer Applications & Industrial Electronics (ISCAIE), Malaysia, 2019, pp. 222-227, doi: 10.1109/ISCAIE.2019.8743906.

[8]. Jadhav, Ajit, et al. "RFID based secure smart school bus system." Department of CSE, IAETSD J, March (2018).

[9]. Gaikwad, Yogesh J. "A Review on Self Learning based Methods for Real World Single Image Super Resolution." (2021).

[10]. V. Khetani, Y. Gandhi and R. R. Patil, "A Study on Different Sign Language Recognition Techniques," 2021 International Conference on Computing, Communication and Green Engineering (CCGE), Pune, India, 2021, pp. 1-4, doi: 10.1109/CCGE50943.2021.9776399.

[11]. Vaddadi, S., Arnepalli, P. R., Thatikonda, R., & Padthe, A. (2022). Effective malware detection approach based on deep learning in Cyber-Physical Systems. International Journal of Computer Science and Information Technology, 14(6), 01-12.

[12]. Thatikonda, R., Vaddadi, S.A., Arnepalli, P.R.R. et al. Securing biomedical databases based on fuzzy method through blockchain technology. Soft Comput (2023). https://doi.org/10.1007/s00500-023-08355-x

[13]. Rashmi, R. Patil, et al. "Rdpc: Secure cloud storage with deduplication technique." 2020 fourth international conference on I-SMAC (IoT in social, mobile, analytics and cloud)(I-SMAC). IEEE, 2020.

[14]. Khetani, V., Gandhi, Y., Bhattacharya, S., Ajani, S. N., & Limkar, S. (2023). Cross-Domain Analysis of ML and DL: Evaluating their Impact in Diverse Domains. International Journal of Intelligent Systems and Applications in Engineering, 11(7s), 253-262.

[15]. Khetani, V., Nicholas, J., Bongirwar, A., & Yeole, A. (2014). Securing web accounts using graphical password authentication through watermarking. International Journal of Computer Trends and Technology, 9(6), 269-274.

[16]. Kale, R., Shirkande, S. T., Pawar, R., Chitre, A., Deokate, S. T., Rajput, S. D., & Kumar, J. R. R. (2023). CR System with Efficient Spectrum Sensing and Optimized Handoff Latency to Get Best Quality of Service. International Journal of Intelligent Systems and Applications in Engineering, 11(10s), 829-839.

[17]. Nagtilak, S., Rai, S., & Kale, R. (2020). Internet of things: A survey on distributed attack detection using deep learning approach. In Proceeding of International Conference on Computational Science and Applications: ICCSA 2019 (pp. 157-165). Springer Singapore.

[18]. Mane, Deepak, and Aniket Hirve. "Study of various approaches in machine translation for Sanskrit language." International Journal of Advancements in Research & Technology 2.4 (2013): 383.

[19]. Shivadekar, S., Kataria, B., Limkar, S. et al. Design of an efficient multimodal engine for preemption and post-treatment recommendations for skin diseases via a deep learning-based hybrid bioinspired process. Soft Comput (2023). https://doi.org/10.1007/s00500-023-08709-5

[20]. Shivadekar, Samit, et al. "Deep Learning Based Image Classification of Lungs Radiography for Detecting COVID-19 using a Deep CNN and ResNet 50." International Journal of Intelligent Systems and Applications in Engineering 11.1s (2023): 241-250.

[21]. Kale, R. ., Shirkande, S. T. ., Pawar, R. ., Chitre, A. ., Deokate, S. T. ., Rajput, S. D. ., & Kumar, J. R. R. . (2023). CR System with Efficient Spectrum Sensing and Optimized Handoff Latency to Get Best Quality of Service. International Journal of Intelligent Systems and Applications in Engineering, 11(10s), 829–839.