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**Introduction.** This paper builds on the initial research for a dissertation on topic "BLOCKCHAIN-based INFORMATION and PAYMENT SYSTEM for SMART PARKING", the purpose of which is to provide a secure, efficient, and decentralized platform for managing parking information and transactions. blockchain-based system for smart parking can help to reduce the costs associated with traditional parking management and payment systems. By automating many of the manual processes and eliminating the need for intermediaries, the system can lower administrative costs, reduce transaction fees and increase the speed and efficiency of parking transactions. In addition, by enabling secure and transparent data management, the system can reduce the risk of errors, fraud or disputes, which can also help to reduce costs and improve overall operational efficiency.

**Main part.** Many recent studies and research have concluded that there is a need for smart parking in every urban city in the world [1-2], and therefore the difficulties facing smart parking must be overcome in all aspects of the practical application of this technology.

- ✚ Approach: Use blockchain technology for implementing smart parking systems.
- ✚ Technologies used: YOLO v5, craft network, ResNet for license plate detection and recognition; smart contracts and a decentralized app (dapp) for information management and payment.
- ✚ Goals: Improve efficiency and security of parking operations, address challenges faced in traditional parking systems such as high costs, time-consuming manual processes, and potential security risks.
- ✚ Benefits of blockchain: Increased transparency, immutability, and decentralization.
- ✚ Advantages of smart parking systems using blockchain: More cost-effective and secure solution for parking management.

Through many experiments carried out on license plates of Russian cars, I can confidently say that we can use cameras equipped with wide view lenses to include up to four holes or more, with the use of computer vision from by using a composite structure of three. Newer and faster models that use more advanced technologies to give the best possible result: YoloV5 algorithm, CRAFT Networks and ResNet, and as a result, we obtained a high accuracy of up to 99 percent in detecting cars as an object and an accuracy of up to 96 percent in detecting an area. The image in which letters and numbers are present, as well as affinity detection, which depends on neural networks, and an accuracy of up to 92 in identifying and extracting numbers and letters, as the Russian model of license Plates were mainly adopted during the practical application, although the application can detect license plates for other countries if a good image database is obtained and trained on it.

The cameras can connect with the smart contract to verify the license plates of cars that are parked in the detected slots and compare them with the license plates recorded in the smart contract. This ensures that the cars parked in the slots match the cars that have been rented, providing an additional layer of security and accuracy to the system.

Drivers can access the system through a decentralized application (dApp) with a user-friendly web interface. The dApp communicates with a smart contract that is responsible for managing parking transactions. Drivers can use the dApp to check for available parking slots and request to rent a slot by entering their car's license plate number only where in global statistics about the blockchain, the

volume of spending is expected to reach \$19 billion in 2024, not to mention that there are more than 82 million wallets and more than 300 million users [3]. The smart contract calculates the time spent in the rental and the associated cost and securely records the transaction on the blockchain.

Through a smart contract that can be easily modified to comply with the requirements and prices of any smart parking service provider and not inconsistent with their internal systems, where the smart parking workflow was planned and then tested before putting it into the framework of an integrated project and then verifying the success of deploying the smart contract locally, and then its success on a test network that almost completely simulates the real Ethereum network, verifying it and publishing the source code so that all those who have doubts about the way the smart contract works are aware of all the details of the contract, payment and slot rental in an environment that enjoys privacy and maintains transparency, reliability, decentralization and stability, Thus, decentralized smart contracts based on the blockchain enable reliable automation of payments [4] depending on the exact time the driver stays in a slot holding state, which is one of the main limitations of existing payment systems.

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**Conclusions.** the use of blockchain technology in smart parking systems helps to improve efficiency, security, and cost-effectiveness. With the integration of cameras with advanced computer vision technology, smart contracts, and a decentralized app (dApp), smart parking systems can provide a reliable and secure solution for parking management. The smart contract ensures that payments are automatically made based on the time spent in a parking slot, providing a cost-effective and transparent solution for parking transactions. The camera's ability to verify the license plates of parked cars and compare them with the license plates recorded in the smart contract adds an additional layer of security to the system. Overall, this approach presents a promising solution for the challenges faced in traditional parking systems.

#### **List of sources used:**

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3. Zippia. "20+ Essential Blockchain Statistics [2023]: Market Size + Trends" Zippia.com. Dec. 15, 2022, <https://www.zippia.com/advice/blockchain-statistics/>
4. DiMatteo, Larry A., Michel Cannarsa, and Cristina Poncibo. The Cambridge handbook of smart contracts, blockchain technology and digital platforms. No. 165739. Cambridge University, 2019.