



AUTOMATED SMART PARKING FOR CARS

Ergashev Odiljon Alijon o'g'li

Intern teacher of the department

"Automation of machine building production"

of the Andijan Mechanical Engineering Institute

Email: ergashevodiljon944@gmail.com

Khasanov Davron Ravshanbek o'g'li

Andijan Institute of Mechanical Engineering

"Intelligent control computer systems"

"Mechatronics" faculty. and robotics" 4th year student

+998901474773

Email: xasanovdavronbek01@gmail.com

Annotation: Smart parking - a special parking space created using sensors and modern technologies to quickly and easily find parking spaces, ensure safety and automate the process of parking a car. The creation of special parking spaces for cars began almost at the same time as the appearance of the first cars. The number of cars is growing rapidly, and modern technologies are being introduced to solve the problem of limited parking spaces. The main direction of development is "smart" parking sensors. Such sensors are installed on the road bed in parking lots and monitor the space or free space above them, transmitting data to the general system. Using such a network of sensors, a parking map is created, the status of which is transmitted to users on the streets using special screens or a mobile application

Keywords: Sensors LoRa, NB-IoT, Sigfox, RFID and Integration with GPS/GLONASS systems.

Introduction: One of the components of smart parking is a smart payment system. This system is actively used in many countries and consists of bank cards, communication using mobile devices, and contactless payment methods. To expand the possibilities, parking spaces can be filled with surveillance cameras, light indicators, motion sensors, etc. Equipping residential buildings, shopping centers with smart parking spaces. Place existing sensors/video cameras on city streets for mapping or parking listings.

The United Nations Department of Economic and Social Affairs has predicted that all the growth in the world's population will live in cities. And the growth rate is expected to reach 68% in 2050. Population growth is not only a pressing issue for governments, but also a real daily reality for most citizens. Searching for parking is a huge waste of time and money, according to a USA Today report, with 35% of

time and \$345 spent on it. Let's take a look at the parking issues and the need for a smart parking system using IOT.

Overcharging- Sometimes drivers or customers don't know how long they will stay at a certain location. So they sometimes overcharge for parking. **Overcharging-** Sometimes drivers or customers don't know how long they will stay at a particular spot. Thus, they occasionally pay extra for parking. **Environmental impact -** Unabsorbed pollutants accumulate in the parking lot and are washed into the reservoir during rains. Large parking lots Augmented reality can create a display function on real images captured by smartphones. These external and internal augmented reality navigation systems can guide drivers through virtual roads to parked cars.

Methods: Smart parking systems have many advantages over current automatic or manual parking systems; some of them are listed below:



- Low capital investment - low space requirements, minimal ventilation, lighting and security systems require no human access.
- Social amenity - more green space in public spaces/ Less stress/ Less time to get a car.
- Fuel/time savings/environmental impact by accurately predicting and detecting point/vehicle fill-up in real-time and directing the driver to the right.
- Better and real-time monitoring and management of available parking space resulting in significant revenue generation.
- Provides tools to optimize workforce management.
- Less likely to damage the vehicle.
- Provides tools to optimize workforce management.
- For better control, allow various law enforcement agencies to control the movement of vehicles
- Security - Drivers and passengers who do not need to enter the parking lot
- Lower land requirement – more vehicles can be parked on the same building footprint.
- Enables transportation agencies to make smarter decisions using historical trends and real-time status data

• Using IoT technology will help the traffic flow more freely in the city

Functional diagram of parking sensors:

Let's consider the principle of operation of the car assistant using the example of one of the options of the functional diagram of the device. The MK microcircuit analyzes the parameters of the received signals (time delay in the case of ultrasonic sensors), after which it determines the further operation of the transmitter and signaling unit (BSI) controls. There are certain differences in the functional diagrams of different car sensors. For example, simpler ones can work without microcontrollers at all. In this case, the control is carried out through other electronic circuits. The operation of this circuit is controlled by the microcontroller. At the specified times, the microcontroller delivers control signals to the transmitter (Transmitter), which turns on the sensors (ultrasound) for transmission. When approaching the obstacle, the signals reflected from it are sent to the receiving circuit, then amplified by the amplifier (U) and sent to the microcontroller.

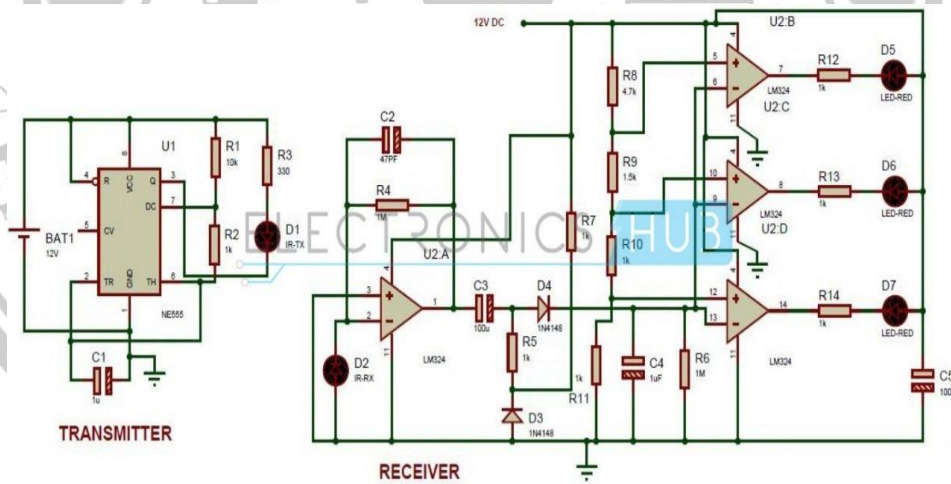


Figure-1. Functional diagram of parking sensors.

The main part of the electrical circuit: The circuit diagram is assembled on the Z86E0208PSC 8-bit microcontroller from ZiLOG (DD1). DA1 is a 7805 voltage stabilizer

that supplies +5 V. The resonant amplifier is assembled using transistors VT1-VT3. Four ultrasonic emitters and receivers (BQ) are used.

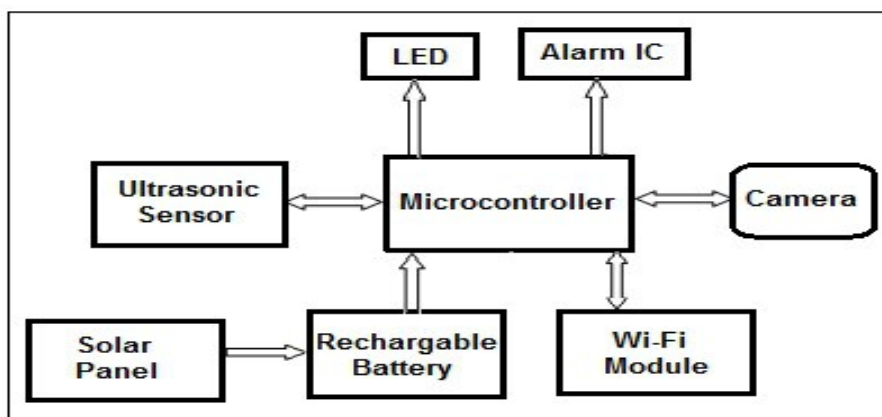


Figure-2. A circuit in a microcontroller.

Conclusion: In this article, we have a lot of information about smart homes. We organized what parts to go, where the sensors go, what motors to go to. When choosing a servo drive, we calculated its most efficient and economically energy-saving option. Humanity is constantly making its work easier as it improves, leaving it to artificial intelligence and mechatronic modules. Robotization of production made it possible to abandon a number of professions, for example, in the last century, telephone operators connected two subscribers, but today telephone communication service is provided only through

electronics. Nowadays, the development has progressed further, and humans have started to create real artificial machines - robots - that can perform various mechanical operations. Today, based on the reforms implemented in our country, it is important to expand production, identify effective directions, and produce competitive products. The main goal of ensuring the integration of modern production with market relations is that the manufactured products are of high quality, meet market requirements, and can compete in market conditions.

REFERENCES

1. Alijon o'g'li, E. O., & Sodiq o'g'li, M. U. (2024). Uarm robots in python data base formation electrical principle and structure scheme design. *European Journal of Emerging Technology and Discoveries*, 2(2), 43-47.
[URL:https://humoscience.com/index.php/itse/article/view/42](https://humoscience.com/index.php/itse/article/view/42)
2. Alijon o'g'li, E. O. (2023). Robototexnik tizmlarning tashqi ob'ektlarga ta'sir ko'rsatishida gidroyuritmalardan foydalanish usullari. *Mexatronika va robototexnika: muammolar va rivojlantirish istiqbollari*, 1(1), 102-104.
[URL:https://humoscience.com/index.php/itse/article/view/43](https://humoscience.com/index.php/itse/article/view/43)
3. Ergashev, O. A. O. G. L. (2022). Robototexnik tizimlarning tashqi obyektarga ta'sir ko'rsatishida suyuqlik oqimlaridan foydalanish usullarini tadqiq etish. *Science and Education*, 3(6), 399-402.
4. Alijon o'g'li, Ergashev Odiljon, va Qo'ldashboev Raxmatullox Zafarbek o'g'li. "quyos paneli monitoring mexatron moduli loyihalanih". *Rivojlanayotgan texnologiyalar va kashfiyotlar Yevropa jurnali* 2.4 (2024): 68-77.
5. Alijon o'g'li, Ergashev Odiljon, va Juraev Asilbek Xotamjon o'g'li. "Zamonaviy scada tizimida isiliklarni loyihalashtirish". *Rivojlanayotgan texnologiyalar va kashfiyotlar Yevropa jurnali* 2.4 (2024): 36-43.
6. Xolmatov Oybek Olim o'g'li, & Xoliqov Izzatulla Abdumalik o'g'li. (2023). Quyosh paneli yuzasini tozalovchi mobile roboti taxlili. *Innovations in Technology and Science Education*, 2(7), 791-800.



- URL: <https://humoscience.com/index.php/itse/article/view/424>
7. Xolmatov Oybek Olim o'g'li, & Vorisov Raxmatulloh Zafarjon o'g'li. (2023). Kalava ipi ishlab chiqarishda paxtani sifatini nazorat qilish muammolarining taxlili. *Innovations in Technology and Science Education*, 2(7), 801–810.
- URL: <https://humoscience.com/index.php/itse/article/view/425>
8. Xolmatov Oybek Olim ugli, & Иминов Холмуродбек Элмуродбек угли. (2023). Экстракция хлопкового масла с использованием технологии субкритической воды. экстракция хлопкового масла с использованием технологии субкритической воды. *Innovations in Technology and Science Education*, 2(7), 852–860.
- URL: <https://humoscience.com/index.php/itse/article/view/432>
9. Xolmatov Oybek Olim ugli, & Хасанов Жамолитдин Фазлитдин угли. (2023). Автоматическая система очистки солнечных панелей на базе arduino для удаления пыли. *Innovations in Technology and Science Education*, 2(7), 861–871.
- URL: <https://humoscience.com/index.php/itse/article/view/433>
10. Xolmatov Oybek Olim o'g'li, & Jo'rayev Zoxidjon Azimjon o'g'li. (2023). Machine learning yordamida idishni sathini aniqlash. *Innovations in Technology and Science Education*, 2(7), 1163–1170.
- URL: <https://humoscience.com/index.php/itse/article/view/477>
11. Xolmatov O.O., Motalipov F.U. "Создание пожарного мини-автомобиля на платформе Arduino" *Universum: технические науки : электрон. научн. журн.* 2021. 2(83).
- URL: <https://7universum.com/ru/tech/archive/item/11307>
11. Xolmatov O.O., Darvishov A.B. "Автоматизация умного дома на основе различных датчиков и Arduino в качестве главного контроллера" *Universum: технические науки : электрон. научн. журн.* 2020. 12(81).
- URL: <https://7universum.com/ru/tech/archive/item/11068>
DOI:10.32743/UniTech.2020.81.12-1.25-28
12. Xolmatov O.O., Burxonov Z.A. "проекты инновационных парковок для автомобилей" *Международный научный журнал «Вестник науки» № 12 (21) Том 4 ДЕКАБРЬ 2019 г.*
- URL: <https://www.elibrary.ru/item.asp?id=41526101>
13. Kholmatov O.O., Burkxonov Z., Akramova G. "The search for optimal conditions for machining composite materials" *science and world International scientific journal*, №1(77), 2020, Vol.I
- URL: http://en.scienceph.ru/f/science_and_world_no_1_77_january_vol_i.pdf#page=28
14. Xolmatov O.O., Burxonov Z., Akramova G "автоматизация и управление промышленными роботами на платформе arduino" *science and education scientific journal volume #1 ISSUE #2 MAY 2020*
- URL: <https://www.openscience.uz/index.php/sciedu/article/view/389>
15. Кабулов Н. А., Холматов О.О "AUTOMATION PROCESSING OF HYDROTHERMIC PROCESSES FOR GRAINS" *Universum: технические науки журнал декабрь 2021 Выпуск: 12(93) DOI - 10.32743/UniTech.2021.93.12.12841*
- URL: <https://7universum.com/ru/tech/archive/item/12841>
DOI - 10.32743/UniTech.2021.93.12.12841
16. Xolmatov O.O., Negmatov B.B "разработка и внедрение интеллектуальной системы управления светофором с беспроводным управлением от arduino" *Universum: технические науки: научный журнал, – № 6(87). июнь, 2021 г.*
- URL: <https://7universum.com/ru/tech/archive/item/11943>
DOI-10.32743/UniTech.2021.87.6.11943.
17. Xolmatov O.O., Negmatov B.B "АВТОМАТИЗАЦИЯ ПРОЦЕССА ОБРАБОТКИ ЗЕРНА" *Universum: технические науки: научный журнал. – № 3(96). Часть 1. М., Изд. «МЦНО», 2022 г.*
- URL: <https://7universum.com/ru/tech/archive/item/13235>



DOI - 10.32743/UniTech.2022.96.3.13235

18. Холматов Ойбек Олим угли “Автоматизация системы зерновых осушителей с помощью плк” *Universum: технические науки: научный журнал.* – № 3(96). Часть 1. М., Изд. «МЦНО», 2022 г.

URL: <https://7universum.com/ru/tech/archive/item/13234>

DOI - 10.32743/UniTech.2022.96.3.13234

19. Холматов Ойбек Олим угли, & Негматов Бегзодбек Баходир угли. (2022). Методы организации логистических услуг с использованием интеллектуальных систем организации грузов. *E Conference Zone*, 219–221.

URL: <https://econferencezone.org/index.php/ecz/article/view/196>

20. Kholmatov Oybek Olim ugli, & Negmatov Begzodbek Bakhodir ugli. (2022). Optimization of an intelligent supply chain management system based on a wireless sensor network and rfid technology. *E Conference Zone*, 189–192.

URL: <http://www.econferencezone.org/index.php/ecz/article/view/467>

21. Oqilov Azizbek, Oripov Shoxruxmirzo, Eshonxodjayev Hokimjon Xotamjon o’g’li, & Sobirov Anvarjon Sobirov. (2022). Remote Control of Food Storage Parameters Based on the Database. *Texas Journal of Engineering and Technology*, 9, 29–32. Retrieved from <https://zienjournals.com/index.php/tjet/article/view/1872>

