

معهد الإسكندرية العالي
للهندسة والتكنولوجيا
ALEXANDRIA HIGHER INSTITUTE OF
ENGINEERING & TECHNOLOGY (AIET)



Alexandria Higher Institute of
Engineering & Technology



GRADUATION

Is not the end, It is the beginning.

Class of 2024



Foreword

AIET is keen to invite prominent Professors and Experts from reputed Egyptian universities and institutions to share in and/or head Project oral Exam Committees. AIET hopes to get benefits of their experience and constructive comments on our students' efforts.

The total number of graduation projects adds to projects distributed among our current four B.Sc. engineering programs as follows:

| B. Sc. Eng. Program | No. of Projects | No. of Students | No. of Supervisors |
|---|-----------------|-----------------|--------------------|
| Electronics and Communication Engineering (ECE) | 12 | 100 | |
| Computer Engineering (CE) | 2 | 30 | |
| Mechatronics Engineering (EME) | 14 | 146 | |
| Industrial Engineering (IE) | 2 | 12 | |
| SUM | | 288 | |

Graduation projects are diversified to cover most of the sub-specialties of a B.Sc. engineering program. Academic staff, from different Universities, other high education institutions, industries, and business; kindly contributed in supervising graduation projects parallel with the academic staff of the AIET.

This booklet gives an overview on B.Sc. graduation projects for the academic year 2023-2024.



معهد الإسكندرية العالي للهندسة والتكنولوجيا كُتيب مشاريع التخرج للعام الجامعي 2023-2024

AIET student performance is evaluated according to the grade-point average (GPA) system. Student graduates where earning 180 credit hours; among them, graduation project represents 6 credit hours which are equivalent to 3.33% of the total 180 credit hours.

Project grading is: 50% of project grade on Year Work and 50% on Final oral Exam.

AIET deeply acknowledges and appreciates the ample effort of all project supervisors to get the project up to the level which, hopefully, will win the satisfaction of project examiners.

Prof. Dr. Eng. Wageeh Ahmed El-Askary, Dean, AIET



| Electronics and Communication Engineering (ECE) | |
|--|--|
| 1 | Design and implementing of an external medical structure for the arm. |
| 2 | Design Implementation of a unit to measure the rates of sea level and its impact on agricultural land |
| 3 | Design and implementation of a full stack virtual reality solution. |
| 4 | Design and Implementation of Multi-Function Semi -Autonomous Quadcopter |
| 5 | Road Sign Marking Robot. |
| 6 | Design a Wireless Power transfer Charger Based on induction Coupling Implementation from A Solar Cell Source Controlled by Net Application |
| 7 | Mobile Communication and implementation of IBS. |
| 8 | Smart Health Insurance pharmacy. |
| 9 | Smart Farming System with Mobile Connectivity. |
| 10 | Prosthetic ARM. |
| 11 | Solar Powered Smart Traffic Solutions Based on IOT and Multi -level Garage Mechanism. |
| 12 | Blindness Smart Assistant |

1- Design and implementing of an external medical structure for the arm.

Supervisor

أ.م.د. محمد الأمير

د. عمرو الجندي

Students

- | | |
|--|--|
| 6. احمد مجدى ابو بكر علي عوض | 1. ندى معوض محمد متولى خليل |
| 7. سلمى محمد فاروق على ابراهيم | 2. نردين مهدى شاکر سعد زين الدين |
| 8. محمود وائل امين محمود مصطفى | 3. ريم محمد احمد محمد بيومي (ميكاترونيات) |
| 9. مصطفى محمد محمد رمضان كساب | 4. مصطفى محمود أحمد محمد بدوى (ميكاترونيات) |
| 10. معاذ رمضان عبد الحكيم حماد ابو العطا | 5. نور الدين محمد محمد عبد الوهاب ماضي (ميكاترونيات) |

Abstract

The project is a treatment for people with special needs who are undergoing motor rehabilitation through the “Biomedical Arm” concept. This arm is not an actual replacement, but rather a “medical exoskeleton” (EMS) – a wearable exoskeleton. This EMS acts as a supportive frame that aids in arm movement and posture. Imagine an adjustable structure that provides stability and control while the user performs everyday tasks such as eating or getting dressed. The key lies in the adjustable assistance you provide. By tailoring the level of support, an EMS can empower individuals with greater mobility and independence. Additionally, this biomedical arm has the potential to enhance motor rehabilitation. By facilitating movement control and reducing fatigue, it can create a more effective environment for restoring lost motor function. This project has the potential to significantly improve the quality of life for those facing upper extremity challenges.

2- Design and Implementation of a unit to measure the rates of sea level and its impact on agricultural land

Supervisor

أ.م.د. محمد الأمير

د. عمروالجندي

Students

- | | |
|-----------------------------------|--|
| 1. ايتن ابراهيم احمد على احمد | 6. احمد محمد عنتر عبد الله عطيه |
| 2. علياء علي ابراهيم علي الشيشيني | 7. اسلام فرج الله جاد ابوهيش |
| 3. محمد مسعد احمد سالم شاهين | 8. احمد رضا فرغلى الدرديري |
| 4. محمود صبري احمد محمد | 9. احمد سمير عبد الهادي محمود عبد الجواد |
| 5. احمد السيد محمد تمام شحاته | |

Abstract

Climate change is considered one of the most important challenges of the current era because of its effects on the environment. Therefore, Egypt included this in its strategic axes 2030.

The topic of the research project was chosen to design and implement an electronic unit to measure the rise in water levels in the Mediterranean Sea because of the melting of ice due to the differences in climate changes and the impact of these changes. The increase in water level in the agricultural areas adjacent to the sea, which may in the future cause a change in the crops that are currently being done. This electronic unit measures changes in height, analyses them,

and extracts the real changes. This unit works using micro sensors and using solar cells as its power source.

3- Design and implementation of a full stack virtual reality solution.

Supervisor

| | | |
|------------------|----------------|------------------|
| د. محمد البوريدي | د.رضا الششتاوي | د. أميرة البطوطي |
|------------------|----------------|------------------|

Students

| | |
|--|---|
| <p>5. يارا السيد محمد مرسي دسوقي</p> <p>6. ياسمين عبد العزيز بسيوني سعد ابوزيد</p> <p>7. احمد عيد حسن على حسن (حاسبات)</p> <p>8. حسن على حسن عبد الكريم (حاسبات)</p> | <p>1. فارس محمد عبد اللطيف مرسي السيد الباسوسي (حاسبات)</p> <p>2. احمد ناصر ابراهيم محمد زكى (ميكاترونيات)</p> <p>3. بيتر مجدى صبحى يعقوب عبد السيد (ميكاترونيات)</p> <p>4. السيد ايهاب السيد غازى ابراهيم (ميكاترونيات)</p> <p>5. شادي مجدي وليم توفيق جرجس (حاسبات)</p> |
|--|---|

Abstract

Designing and implementation of a full stack virtual reality solution (VR) project presented aims to immerse users in a meticulously crafted virtual environment, enabling interaction across diverse fields such as interior design, education, and entertainment. This paper outlines the integration of software, hardware, and 3D printing frameworks to deliver a comprehensive VR experience. Utilizing a Raspberry Pi, MPU6050, ESP32, and joystick modules, the project constructs a functional VR headset and hand controller, ensuring seamless interaction with virtual spaces.

The development process leverages Unity Game Engine for crafting virtual environments and embedded software for managing the microcontrollers. The physical design of the VR components, including the headset and hand controller, is executed using Fusion 360, emphasizing precise ergonomic dimensions.

The primary outcome is the successful creation of a virtual space within Unity that boasts realistic visuals and interactive elements. This virtual environment is packaged as an APK application, running on a Raspberry Pi with an Android operating system. The project demonstrates the feasibility of integrating low-cost hardware with advanced software frameworks to produce an engaging and interactive VR experience. These results highlight the potential of this approach for applications in various domains, paving the way for more accessible and customizable VR solutions.

4- Design and Implementation of Multi-Function Semi -Autonomous Quadcopter

Supervisor

د. رضا الششتاوي

د. محمد البوريدي

د. أسماء عطية

Students

6. روان مصطفى احمد عبد الرحمن على
7. طارق احمد فريد مرسى محمد
8. عبد الرحمن وليد عبد الرحمن محمد محمد
9. عمرو حاتم سمير ابراهيم سرور

10. ندا احمد جمعه البسيونى
11. احمد سعيد عبد الوهاب عبد العال محمد (ميكاترونيات)
12. حسن محمد حسن نعيم النفراوى (ميكاترونيات)
13. يحيى اسامه عبد الحميد احمد جودت (ميكاترونيات)
14. حسين خميس خميس حسن سليمان

Abstract

This project report details the design and implementation of a multi-function semi-autonomous quadcopter, focusing on both the mechanical and electrical aspects, as well as the integration of control systems and software. The primary objective is to develop a versatile aerial platform capable of performing various tasks autonomously or with minimal human intervention.

The mechanical design involves the selection and analysis of suitable components to ensure stability and efficiency in flight. Key components include electric motors, propellers, and a robust frame structure. Electrical analysis covers the selection of motors, batteries, and control systems essential for reliable operation.

A significant portion of the project is dedicated to the control system, which utilizes a combination of flight controllers and Internet of Things (IoT) components. This includes the use of Arduino and Raspberry Pi for processing, along with sensors like GPS modules and cameras for navigation and task execution. The choice of flight controller and development boards is justified based on performance and compatibility considerations.

Software implementation involves developing algorithms for autonomous flight, object detection, and data transmission. The system architecture is designed to enable remote



معهد الإسكندرية العالي للهندسة والتكنولوجيا كُتيب مشاريع التخرج للعام الجامعي 2023-2024

monitoring and control, employing technologies like Bluetooth, Wi-Fi, and GSM for communication.

The quadcopter is tested for various applications, demonstrating its capability in surveillance, environmental monitoring, and delivery tasks. The results indicate a successful integration of mechanical, electrical, and software systems, meeting the project's objectives.

Safety protocols and sustainable development considerations are also addressed, ensuring the project aligns with best practices and ethical standards. Future recommendations include enhancements in autonomous capabilities and the incorporation of advanced machine learning algorithms for improved performance.

5- Road Sign Marking Robot

Supervisor

د. حسن الشوباشي

د. عمرو ياسين

Students

- | | |
|---|--|
| 1. على محمد فؤاد شمس الدين مصطفى | 6. يوسف محمد عز الدين السيد حسن |
| 2. كريم مصطفى حافظ يونس | 7. يوسف عادل محمود اسماعيل بدر (حاسبات) |
| 3. محمد نبيل صلاح السيد عرفه | 8. يوسف محمود منصور سليم (حاسبات) |
| 4. يوسف عبد الصمد زكريا عبد الصمد مزروع | 9. محمد السيد عبد الرحمن السيد مبروك (ميكاترونيات) |
| 5. يوسف علاء الدين عبد العظيم حسين | 10. محمد صلاح بسيوني محمود سليمان (ميكاترونيات) |

Abstract

This research abstract presents a highly advanced robot designed to identify streets, color sidewalks in two different colors, and self-illuminate at sunrise using a sensor (LDR), and includes several sensors to enhance its functionality. The robot features an ultrasonic sensor to detect obstacles in its path, and a water level sensor to detect the presence of water. And an LCD screen for identification purposes. There is also a camera to display a direct image of the robot. The robot also works using a solar panel system as another source of energy, and by integrating these sensors and functions, this innovative robot shows efficiency and effectiveness in completing its specific tasks.

The main goal of this robot is to identify streets and color sidewalks in two different colors, which enhances their visual appeal and determines whether the sidewalk is located where cars can park or not. It achieves this using a specially designed mechanism that allows this. This ability enables the robot to create complex patterns or designs on sidewalks, adding liveliness to urban landscapes.

In addition, the robot includes an LDR sensor that enables it to automatically self-illuminate when the sun rises. This feature ensures the robot remains visible and operational during daylight hours, enhancing safety and visibility for pedestrians and other sidewalk users.

To effectively navigate its surroundings, the robot is equipped with an ultrasound sensor. This sensor allows the robot to detect obstacles in its path, enabling it to autonomously avoid collisions and complete coloring tasks without interruption. This ability to detect obstacles ensures efficient operation and reduces potential damage to both the robot and its environment.

Integrating a Color Sensor allows the robot to know whether the sidewalk is colored or not. This data provides valuable insights into the painting process. Taking into account this data, the robot can decide to stop painting to ensure painting results.

The robot includes an LCD screen through which one can identify the number of times the color has been sprayed on the ground.

The robot includes a (solar panel). The robot has a solar panel system as another source of energy.

The robot includes a (water level sensor) which is used to determine whether there is water on the road or not before spraying.

The robot includes (Asp camera), and the camera is used to display a direct image from the robot.

WE can control the robot by using application and this application is connected to robot by using Bluetooth module.

In conclusion, this advanced robot displays a range of innovative features and functions. By combining the ability to identify streets and color sidewalks in two different colors, self-lighting, obstacle detection, water level detection, and a screen to recognize the number of times color has been sprayed on the ground, this robot shows efficiency and effectiveness in completing its specific tasks. The integration of multiple sensors and functions ensures optimal results, adaptation to various environmental conditions, and smooth operation in urban environments.

6- Design a Wireless Power transfer Charger Based on induction Coupling Implementation from A Solar Cell Source Controlled by Net Application

Supervisor

د. طارق عبد الشهيد

د. محمد عادل

Students

- | | |
|--|-----------------------------------|
| 1. أحمد كمال فتح الله حسن | 6. يحيى محمد علاء احمد يوسف |
| 2. كريم محمد عبد المعطي احمد ابوالعلا | 7. يوسف احمد محمد عيد سرور |
| 3. محمد عبد الناصر محمد احمد على | 8. يوسف اسامه ابراهيم يوسف على |
| 4. محمد علاء الدين امين اسماعيل | 9. يوسف اسامه عطيه سلامه عطيه |
| 5. مروان حسام الدين محمد عبد العزيز محمد | 10. يوسف محمد ابوالعزیز ابوالعزیز |

Abstract

Wireless power transfer (WPT) is a very broad though relatively new technology. Almost 80% of references are dated later than the year 2010. Hence, the scope of the project was limited to implement the inductive power transfer mode only. The question of our project was aimed to answer was simple, are we ready to use cordless electricity in our everyday lives? Last but not least, my utmost aims that I set in the beginning were to apply the gained knowledge in practice, assess my professional competence and development needs and learn how to work in a professional team researching a totally new technology. Wireless power transmission is the transmission of electrical energy without using any conductor or wire. It is useful to transfer electrical energy to those places where it is hard to transmit energy using conventional wires. In this project, we designed and implemented a wireless power transfer system using the basics of magnetic resonant coupling. Numerical data are presented for power transfer efficiency of both receivers. Graphs are given to show the comparison of power and efficiency with distance of both receivers. This project investigates wireless energy transfer systems based on resonant inductive coupling with applications such as charging electric equipment's. Wireless energy transfer can be used to power or charge stationary and moving objects, and the interest in energy transfer over the air has grown considerably in recent years. We study



wireless energy transfer systems consisting of two resonant circuits that are magnetically coupled via coils. Further, we explore the use of magnetic materials and shielding metal plates to improve the performance of the energy transfer. We find that magnetic materials can significantly increase the coupling between the two coils and reduce the induced currents and losses in the shielding metal plates. Further, we design wireless energy transfer systems capable of a peak-value power transfer over an air gap controlled by Bluetooth application. This is achieved without exceeding the exposure limit of magnetic fields in areas where humans can be present.

7- Mobile Communication and implementation of IBS

Supervisor

د. فاطمة أحمد

د. رشا الخامي

Students

6. جابر محمد جابر السيد
7. زياد محمد عبد السيد محمد سيد احمد
8. فرح محمد خليل ابراهيم محمد مرسى
9. محمد عادل عبد اللاه احمد

1. ابراهيم شكرى محمد شكرى حسين
2. احمد جابر محمد الصاوي محمد ابوغزاله
3. احمد عبد الحميد محمد عبد العزيز محمد
4. احمد عبد العزيز عمار محمد
5. احمد نبيل ابراهيم العليمي

Abstract

Mobile networking is one of the areas in the very rapid growth of mobile and wireless communication due to the advancement of technology in all fields nowadays. The new standard appears to be 4G mobile communication system while 5G stands for cellular and wireless communication of the next generation.

We will discuss the journey of wireless communication from the first three generations (1G, 2G, and 3G) to the fourth (4G) and fifth (5G) generations. from analog voice transmission to digital data services. The transition from 3G to 4G marked a significant leap in data speeds and mobile internet access, paving the way for transformative applications. Furthermore, the advent of 5G promises unprecedented levels of connectivity, with ultra-fast speeds, low latency, and massive device connectivity, heralding a new era of innovation and connectivity. Our project has two applications. First, In-Building Solutions (IBS) which tends to use what we will discuss in details in mobile generations, antennas and microwave links to provide network connectivity to buildings that have weak network reach using iBwave software. The second application is a GPS tracking system using GSM (2G) that will be applied to smart cars to get their location, speed, send Save Our Souls (SOS) messages by SMS, a combination of what we will discuss throughout the whole project in mobile and GPS technologies.

8-Smart Health Insurance pharmacy

Supervisor

د. أسماء محمد علي

Students

7. مازن حمدي احمد رمضان عامر (حاسبات)
8. يوسف سامي محمد علي الطويله (حاسبات)
9. حبيبه خالد جمعه علي عيسى (ميكاترونيات)
10. خالد محمد احمد عبدالدايم عسقلاني (ميكاترونيات)
11. يوسف طارق خليل محمد سليمان (ميكاترونيات)

1. بسمة عبد المنعم دياب خليفة هيبه
2. روان احمد محمد عبد الشافي عبد الله مطاوع
3. ريهام محمد سعيد احمد سعيد
4. رضوى احمد عوض سيد احمد
5. حبيبه محمد صبحى عبد الستار السيد (حاسبات)
6. عمرو حسن عبد الحميد حسن حسين (حاسبات)

Abstract

This project is based on two main parts:

- First part, a website for patients and doctors to interact with.
- Second part, a machine responsible for dispensing medications to patients.

Firstly, the website which contains two modes:

- The First one for the doctor, who can control the data of all his patients including features for adding and updating patient information, medical history, and treatment plans.
- The second one for the patient, through which he can see his medications include details such as name, image, description, dosage and obtain the QR code that the machine will scan and then begin the medication dispensing process.

Secondly, the vending machine which is responsible for four processes:

- First, the process which is responsible for scanning the QR code and obtaining instructions such as the patient's name and ID, then accessing this patient's database using his ID to obtain his medications, through which the rest of the three processes will begin.

- Second, the elevator that collects the medicine from the shelf and delivered it to the pickup door, which avoids the product being damaged when falling.
- Third, the process which is responsible for moving the medicine until it is placed on the elevator. This medicine is moved by a specific motor, which starts for a certain period, based on ensuring that the medicine has placed on the elevator.
- Fourth, the sensor that is responsible for capturing the movement of the medicine and the result of this process either start the elevator to move to the place where the medicine is picked up depend on medicine has been captured by sensor, or turning on the medicine's motor again depend on medicine has not been captured by sensor.

9- Smart Farming System with Mobile Connectivity

Supervisor

د. نهال مبروك

د. مروه سماره

أ.م.د. قاسم قدری

Students

7. فيلوباتير سعيد حليم يوسف بخيت
8. محمد احمد فؤاد عبد الحليم محمد هنداوى
9. محمد احمد فاروق العربى حسنين
10. محمد جمال على على الجمال
11. محمد سعد فتحى عبده احمد (ميكاترونيات)

1. زياد عماد الدين حسن علي
2. صهيب سعيد محمود شتا
3. عبد الرحمن جلال كامل مصباح
4. عمر احمد عطيه متولى الطباخ
5. عمر بكر مرسي احمد البنا
6. عمرو موسى عبد الله اسماعيل محمد

Abstract

This project presents an innovative solution for modern agriculture through the integration of smart technologies and mobile connectivity. Leveraging a variety of sensors including soil moisture, temperature, ultrasonic, and light-dependent resistor (LDR), our system aims to optimize crop management, enhance security, and minimize resource consumption.

The core functionalities of the system include automated irrigation based on real-time soil moisture levels detected by soil moisture sensors, ensuring optimal hydration for crops while conserving water resources. Additionally, temperature sensors facilitate precise monitoring of environmental conditions crucial for crop growth.

Enhanced security measures are implemented through automatic gates equipped with ultrasonic sensors for obstacle detection, complemented by a keypad and camera system for access control and surveillance.

To further optimize energy consumption, a lighting system controlled by LDR sensors is employed, enabling illumination only during nighttime hours.

Moreover, the entire system is powered by solar energy, reducing reliance on conventional power sources and promoting sustainability.

Integration with mobile connectivity enables remote monitoring and control, empowering farmers with real-time insights and control over farm operations from anywhere, at any time.



معهد الإسكندرية العالي للهندسة والتكنولوجيا
كُتيب مشاريع التخرج للعام الجامعي 2023-2024

Overall, this project represents a comprehensive and efficient approach to modernizing agriculture, fostering increased productivity, sustainability, and resilience in farming practices.

10- Prosthetic ARM

Supervisor

د. نهال مبروك

د. مروه سماره

Students

- | | |
|---|---|
| 1. ايهاب وائل محمود محمد الريفى | 7. سليمان محمد سليمان محمد احمد |
| 2. جورج ملاك ابراهيم رزق عوض | 8. عبد الرحمن احمد صبحى فرج احمد |
| 3. حاتم عبد الرؤف محمد على | 9. حسين محمد احمد رجب(ميكاترونيات) |
| 4. حسام الدين محمد عبد المنعم مصطفى عامر الوكيل | 10. زياد ابراهيم محمود احمد حامد(ميكاترونيات) |
| 5. رضوى احمد حسن على حسن | |
| 6. سلمى هانى فتحى سليمان سليمان | |

Abstract

This project focuses on advancing prosthetic technology in alignment with Egypt's Vision 2030, particularly the goals of promoting good health and well-being. The prosthetic arm targets individuals who have experienced limb loss just below the elbow to the fingers, offering a lightweight, user-friendly design with various advanced control systems. Utilizing PLA+ as the base material and body frame, the prosthetic arm ensures sustainability, durability, and ease of use.

The project incorporates innovative technologies such as camera recognition, a web application, and EMG sensors(simulation), which provide enhanced control and customization options for users. These features enable intuitive operation and greater functionality for amputees, allowing them to perform daily tasks with confidence.

The prosthetic arm serves multiple settings, including hospitals, clinics, and rehabilitation centers, and is designed for easy maintenance and future upgrades. By leveraging widely available electrical components, the project promotes accessibility and affordability

11- Solar Powered Smart Traffic Solutions Based on IOT and Multi -level Garage Mechanism

Supervisor

د. نهال مبروك

د. مروه سماره

د. أحمد هاني

Students

- | | |
|---|--------------------------------------|
| 7. مصطفى محمد على محمد | 1. احمد حسنى حفظى محمد حسين |
| 8. ندى محمد محمد على مصطفى الملاح | 2. احمد رحى عبد المنعم عوض عباده |
| 9. احمد محمد ابراهيم الدسوقى مرسى الجمل (ميكاترونيات) | 3. اكرم ابوبكر متولى محمد طه |
| 10. الاء مجدى احمد محمد وهيب (ميكاترونيات) | 4. مؤمن سعيد بغدادى محمد ابراهيم |
| 11. عبد الرحمن ايمن محمد محمد السيد مكى (ميكاترونيات) | 5. محمد محمود صبحى عبد اللطيف الشريف |
| 12. مصطفى سعيد ابراهيم حنيتة ابراهيم | 6. محمود جلال خميس محمود محمد |

Abstract

The Solar Powered Smart Traffic Solutions with Multi-Level Garage Mechanism project is a cutting-edge initiative that aims to revolutionize the way traffic is managed and parking is organized in urban areas. This project offers a range of innovative solutions that leverage advanced technologies and sustainable energy sources.

Firstly, the project addresses the challenge of managing train crossing roads. By utilizing sensors, the system can accurately detect the location of an approaching train. In response, an automatic gate is deployed to secure the road, preventing any cars or pedestrians from crossing while the train passes. Additionally, an audio alarm is activated to alert people in the vicinity about the approaching train, enhancing safety and reducing accidents.

Secondly, the project introduces a smart garage system that optimizes parking space utilization. The system employs sensors to continuously monitor the number of empty spaces within the garage. This information is then transmitted to a cloud service, enabling users to access real-time data on the availability of parking spaces and the corresponding prices. Moreover, the garage is equipped with screens and LEDs that display the number of empty spaces in each area, facilitating efficient parking for users.

The third solution offered by this project is a traffic light management system that dynamically adjusts the timing of traffic lights based on crowd levels. By utilizing sensors to measure



congestion levels, the system can optimize traffic flow and reduce congestion in real-time. This ensures a smoother driving experience for commuters and minimizes travel time.

The fourth solution is a Multi-level garage operated by a mechanical mechanism to address the issue of limited parking space in urban areas. We aim to build a unique vertical garage system that maximizes parking capacity by utilizing vertical space.

Lastly, the project introduces smart street lights that are powered by solar panels. These street lights are designed to only illuminate when a car is passing by at night, thereby saving energy and reducing light pollution. Additionally, the street is equipped with screens that display important information such as permitted speed limits and messages regarding road closures or congestion due to accidents. This enhances road safety and provides valuable real-time information to drivers.

Overall, the Solar Powered Smart Traffic Solutions with Multi-Level Garage Mechanism project offers a comprehensive set of solutions to improve traffic management and parking efficiency. By leveraging advanced technologies, such as sensors, cloud services, and solar power, this project aims to create a sustainable and intelligent transportation ecosystem that enhances safety, reduces congestion, and improves the overall urban commuting experience.

12- Blindness Smart Assistant

Supervisor

د. لمياء علي

د. علا حسين

د. أسماء محمد علي

Students

| | |
|--|--|
| 1. محمد احمد حسن محمد ابراهيم | 6. شادى رمسيس رؤوف ابراهيم (ميكاترونيات) |
| 2. محمد السيد عبد السمیع احمد ابوجانب | 7. عبد الفتاح محمود عبد الفتاح عبد المنعم عجوه (ميكاترونيات) |
| 3. محمد ايمن احمد عصران مشالى | 8. محمد ابراهيم محمد حامد على (ميكاترونيات) |
| 4. كريم احمد عبد الفتاح احمد محمد (حاسبات) | 9. محمود رضا محمد عبده ابو العنين (ميكاترونيات) |
| 5. محمد حسن انور محمد السيد (حاسبات) | 10. يوسف احمد عبدالموجود عبدالحليم عبد الموجود (حاسبات) |

Abstract

This paper introduces Smart Vision, an assistive technology device designed to promote independence and well-being for individuals with visual impairments. Smart Vision employs a multifaceted architecture, integrating a user-friendly mobile application built with React Native for a seamless interface and Firebase for robust backend support. The system leverages a Raspberry Pi for efficient data processing. The hardware component incorporates a comprehensive suite of sensors, including ultrasonic sensors for obstacle detection during navigation, a GPS module for real-time location awareness, an oximeter for blood oxygen monitoring, and temperature sensors for environmental analysis.

Smart Vision incorporates cutting-edge Artificial Intelligence (AI) features, enabling accurate object and face recognition within the user's surroundings. This real-time object recognition empowers users to interact with their environment more effectively, fostering a sense of confidence and security. Additionally, the mobile application facilitates remote monitoring and support from caregivers or designated observers, enhancing user safety and providing peace of mind.

By harnessing the processing power of the Raspberry Pi and the diverse functionalities of the integrated sensors, Smart Vision offers a holistic solution. It safeguards users by detecting obstacles, guides navigation with GPS assistance, monitors vital health parameters through the oximeter, and keeps users informed about their environment through temperature sensors.



معهد الإسكندرية العالي للهندسة والتكنولوجيا

كُتيب مشاريع التخرج للعام الجامعي 2023-2024

This comprehensive approach fosters a sense of control and independence, allowing users to navigate their surroundings with greater ease.

In conclusion, Smart Vision transcends the boundaries of a mere assistive device. It functions as an empowering tool, demonstrably enhancing mobility, promoting well-being, and ultimately elevating the quality of life for individuals with visual impairments.



معهد الإسكندرية العالي للهندسة والتكنولوجيا
كُتيب مشاريع التخرج للعام الجامعي 2023-2024

| Computer Engineering Department (CE) | |
|---|--------------------------------------|
| 1 | Health care. |
| 2 | Health care and emergency assistant. |

1- - Health Care .

Supervisor

د. لمياء سعيد

د. أسماء محمد على

Students

6. ميار ياسر على شحات عثمان
7. يارا ايهاب سعيد حمادى

1. احمد محمد سرور بدر خليل
2. انجى محمد عبد الرحمن سعد
3. ايهاب احمد على حميده محمود
4. بسنت رضا صبحى يمنى عطيه الشاعر
5. محمود محمد اسماعيل سليمان الجرف

Abstract

Sustainable development is a call for action by all countries – developed and developing. They recognize that ending poverty must go together with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection. Currently, there are a number of tools for assessing products' sustainable impact and improving their performance. This project will serve goal number three which is good health and well-being.

There are many individuals around the world who need continuous health monitoring, such as people who suffer from chronic health diseases or those who are recovering from surgery, and with technological advances, the way has been paved to provide innovative solutions in Facilitating monitoring the health status of these people.

This project introduces a comprehensive approach to remote health monitoring through providing real-time data on temperature, oxygen saturation, and heart activity through a range of specially designed sensors for accurate and consistent measurements of key health indicators, the device helps in identifying abnormalities promptly, which can be

critical in preventing complications and managing health conditions effectively. By quickly analyzing these vital signs, it not only identifies potential diseases but also formulates personalized treatment recommendations, empowering individuals to take proactive steps towards wellness.

Furthermore, a remote healthcare monitoring system allows healthcare professionals, including doctors, to access patient data through a secure application. This feature enhances communication between the doctor and the patient and allows timely interventions based on the patient's health trends, which may save the patient's life if his health values are critical.

Another advantage of the health care project is that the patient can register in the application one of the people close to him as an Observer. The application will alert him if the patient's health values are critical, which is important in saving the patient's life if he is in a critical health condition that prevents him from communicating with the doctor.

Overall, the project aims to support community healthcare by providing advanced monitoring tools for individuals with specific health needs. It also seeks to improve user independence and well-being by providing intuitive interfaces and personalized health insights through the device.

2- Health care and emergency assistant

Supervisor

د. لمياء على أحمد

د. أسماء محمد على

Students

6. ناردين صموئيل بطرس سعيد ميخائيل

1. احمد محمد احمد عبد المنعم مصطفى

2. تقى محمد محمد حسن حسين

3. روفانا محمد كامل خلف الله الجندي

4. سلمى حامد عبد الحليم عبد العلى بكر

5. محمد رمضان محمد كامل

Abstract

Healthcare assistance is becoming increasingly popular, as it provides a convenient and affordable way for people to manage their health and well-being. It also facilitates communication with healthcare providers, and has the potential to improve the healthcare delivery process, making it more accessible and personalized. People can benefit greatly from healthcare apps. Healthcare applications can link smart watches with the application to call for emergency ambulance and save patient life in the first minutes

The healthcare app has a variety of features that make it usable and accessible. These qualities can consist of:

Access to healthcare services and information has been improved due to the use of health apps, which can help people access services and information that may be challenging for them. For example, a person may be able to use a health care app to communicate with a doctor or nurse online.



معهد الإسكندرية العالي للهندسة والتكنولوجيا كُتيب مشاريع التخرج للعام الجامعي 2023-2024

Independence: Deaf and dumb people can manage their health more independently with the help of a healthcare app. For example, a person may be able to translate sign language into written sentences that facilitate communication between them and their health care providers.

In addition, these healthcare applications will provide emergency personnel with evidence of medical records, current status, and an estimate of cases in critical situations.



| <u>Mechatronics Engineering Department (EME)</u> | |
|---|---|
| 1 | Modified Filling and Capping System. |
| 2 | Agricultural spraying robot remotely controlled |
| 3 | Cutter Machine with Robot Arm |
| 4 | Design and Implementation of a 6-DOF Medical Robotic Arm with Remote Control System |
| 5 | Super-Efficient solar cel |
| 6 | Design and implementation of Stairs Climbing Wheelchair |
| 7 | Design and implementation of 3d printer and scanner with recycling |
| 8 | Design and Implementation of Smart Agriculture Robot |
| 9 | Design and implementation of brackish water Ro desalination unit power by solar energy and recovery energ |
| 10 | Solar Powered Smart Wheelchair controlled by Voice commands, Android app and Joystick |
| 11 | Design and Fabrication of a Smart quilibrium Maintainer |
| 12 | Development of smart aquaculture farm management system |
| 13 | Electrical Power planning and Distribution for a hospital using solar energy for feeding. |
| 14 | Solar Playfield marking robot. |

1- Modified Filling and Capping System

Supervisor

| | | |
|------------------|-----------------|--------------|
| أ.م.د. قاسم قدرى | د. حسن الشوباشى | د. أمته سعيد |
|------------------|-----------------|--------------|

Students

| | |
|------------------------------------|---------------------------------------|
| 1. عبد الرحمن عزت كامل محمد | 6. محمد عصام محمد محمد البياع |
| 2. كرم رضا يونان جرجس حنا | 7. محمود احمد زكريا مصطفى عيسى |
| 3. محمد خميس مصطفى محمد الاقداحى | 8. محمود على محمود ابراهيم جعفر |
| 4. محمد عبده محمد المسلمانى | 9. محمود ماهر عبد الرحمن ابراهيم غاتم |
| 5. محمد عثمان عبد المنعم ابو النجا | 10. محمود متولى محمود متولى عارف |

Abstract

Over the past years automation has impacted a wide range of industries beyond manufacturing through the reduction of production time and cost . The Manual filling methods being used are resulting in low production outputs and losses through spillages. The procurement of state of art bottling systems is cost prohibitive as most systems are designed for large scale industries. This project describes the design of a low cost flexible automated bottle filling machine capable of filling two different volumes and different fluids. A primary calculation was used to determine the most suitable material, transfer system and filling mechanisms for the machine. A conveyor based transfer system was developed coupled to a filling unit which fills a certain number of bottles at a time. Developed control algorithms were implemented on an Arduino uno of the microcontroller ATmega 2560 As It is the largest Arduino series with 28 digital input and output pins, among which 14 pins are used as PWM outputs. It has also 6 analog inputs , so it better from the point of cost . System integration is resulted in a physical prototype which is produced based on the calculation and the objective of the work . a test rig for the apparatus built and is tested

2- Agricultural spraying robot remotely ontrolled

Supervisor

د. هشام عابدين

د. حسن الشوباشي

Students

7. اسلام ياسر محمد ابراهيم البنا
8. جورج حبيب سعد معوض سعد
9. حمدي سعد سليمان محمد حموده
10. زياد رزق السيد حسن عبد الله
11. محمد محمد حسن على عثمان

1. احمد محمد عبده محمد عبده
2. احمد محمد فوزي محمد حسن
3. احمد مصطفى محمد مصطفى باشا
4. احمد هاني احمد محمد شعبان
5. ادهم هشام السيد حسن المكى
6. اسلام احمد عبد المعطي ابراهيم عبده

Abstract

The Smart Agricultural Irrigation and Pesticide Spraying Robot is an innovative project aimed at automating and optimizing the irrigation and pesticide spraying processes in agricultural lands. This robot, controlled and monitored through a mobile application, incorporates various sensors to ensure efficient irrigation and pesticide application while considering weather conditions, fire safety, water levels, obstacle avoidance, and precise control of irrigation pumps. Additionally, the system is secured with RFID technology to restrict access and ensure only authorized personnel can operate it.

Project Overview:

The main objective of this project is to develop a robot that can irrigate agricultural lands and spray pesticides based on real-time data and user inputs. The system consists of the robot itself and the mobile application for control and monitoring.

1. Robot Design:

The robot is specifically designed to navigate agricultural lands and perform irrigation and pesticide spraying tasks. It is equipped with wheels for mobility and incorporates various sensors to gather essential data for decision-making. The robot is powered by batteries, ensuring energy efficiency and sustainability.

2. Mobile Application:

The mobile application serves as the interface for controlling and monitoring the robot. It allows authorized personnel to remotely control the robot's movements, irrigation pumps, and pesticide spraying mechanisms. Users can also access real-time data from the onboard sensors, including temperature, humidity, fire alarms, water levels and obstacle detection. The application provides a user-friendly method that displays this information for informed decision-making.

3. Sensor Integration:

To enhance the efficiency and effectiveness of the irrigation and pesticide spraying processes, the robot is equipped with several sensors:

- Temperature and Humidity Sensor: This sensor detects and measures the weather conditions in real-time. The data collected is displayed on the mobile app, allowing users to make informed decisions regarding irrigation schedules and pesticide application.

- Fire Alarm Sensor: A fire alarm sensor is integrated into the robot to ensure fire safety in agricultural areas. It detects the presence of smoke and sends immediate alerts to the mobile app, enabling prompt action to prevent potential disasters.

- Water Sensor: The water sensor detects if the robot is approaching a pool or body of water. If water is detected, the robot adjusts its path to avoid sinking and potential damage.

- Ultrasonic Sensor: This sensor enables obstacle avoidance by detecting objects or obstacles in the robot's path. It helps the robot navigate around barriers during irrigation and pesticide spraying operations.

4. RFID Security:

To maintain security and prevent unauthorized access, the robot is equipped with an RFID system. Authorized personnel are provided with RFID tags or cards that grant them



access to control and operate the robot. The RFID reader integrated into the mobile application verifies the personnel's identity before allowing them to interact with the robot.

The robot will also be powered by Solar power using a solar panel that charges the batteries to extend the battery charge while being used and increase the travel distance during daylight

3- Cutter Machine with Robot Arm

Supervisor

د. سمیه أحمد

د. حسن الشوباشی

Students

7. محمد عبد الحمید ابوشبانه (الکترونیات)
8. محمود مديح السید (الکترونیات)
9. محمود مصطفى محمود عبد الوهاب (الکترونیات)
10. مصطفى محمد عبد الوهاب الشریف (الکترونیات)
11. احمد سعيد محمد مبروك عبد الاله (حاسبات)

1. ابراهيم خالد مصطفى القحـاوي
2. احمد اشرف لزناتي
3. احمد عبد الحمید رضوان راشد رضوان بدوی
4. بسمله محمود السـلامونی
5. عمرو موسى موسى عبد الجواد
6. رنا محمد محمود السید (الکترونیات)

Abstract

The presented project aims to design and implement an autonomous robot for grass cutting in sports fields, public parks, and agricultural lands. This robot operates using solar energy harvested from environmentally friendly photovoltaic cells, ensuring a sustainable and eco-friendly solution. The robot is designed to navigate through rough and uneven terrains with ease, equipped with versatile tools for cutting various types of grass. Key features of this robot include a six-axis articulated robotic arm that removes obstacles, ensuring uninterrupted operation. The robot is also outfitted with multiple sensors, such as ultrasonic sensors and MPU6050, to enhance accuracy and prevent errors in task execution. These sensors enable the robot to predict potential dangers, determine necessary actions, and return to its origin after completing its tasks. Fieldwork involves deploying the robot in various terrains, including sports fields, public parks, and agricultural lands. During operation, the robot navigates these terrains while performing grass cutting and object removal tasks. The cutting mechanism is designed to handle different types of grass, providing a versatile solution for various



environments. The robot's behavior is controlled and monitored via a mobile application connected through Bluetooth. This app allows users to input specific commands, set operational parameters, and monitor the robot's performance in real-time. Users can control the robot's path, start or stop operations, and receive alerts about obstacles or issues detected by the sensors. The grass-cutting mechanism is designed to be efficient and adaptable to different grass types and thicknesses. The robot detects objects in its path using ultrasonic sensors, and the MPU6050 helps in maintaining stability and precise movements. When an obstacle is detected, the robotic arm engages to remove or clip the object, ensuring the path remains clear for continuous operation.

4- Design and Implementation of a 6-DOF Medical Robotic Arm with Remote Control System

Supervisor

د. احمد فؤاد كشك

د. سميه أحمد

د. حسن الشوباشي

Students

1. احمد اشرف فـرج الخـضـرجي

2. اسماعيل محمد محمد عبده

3. خالد حماده احمد حسن

4. شـريف محمد على سعد

5. عبد الرحمن حسن عبد الرحمن الشيخ

6. عبد الرحمن عصام محمد ابراهيم صقر

7. على صفوت كشك

8. عمر محمد محمد السيد

9. اسامه محمد السيد (الالكترونيات)

10. محمد جمال سعد عبد العال (الالكترونيات)

11. محمد محروس مصطفى (الالكترونيات)

Abstract

This project focuses on developing a 6-DOF medical robotic arm with remote control capabilities, equipped with a laser beam for precise medical applications such as laser surgery and dermatological treatments.

Main Components:

- 6-DOF Robotic Arm: Allows movement in six directions for high precision.
- Medical Laser Beam: Used for various precise medical procedures.
- Remote Control System: Operated via a laptop using Bluetooth or Wi-Fi.

Objectives:

- Achieve high accuracy in medical applications.
- Enhance safety and comfort for both doctors and patients through remote control.
- Provide a flexible and scalable system adaptable for multiple medical uses.

Expected Outcomes:

- High precision in medical procedures.
- Improved surgical efficiency and reduced patient recovery time.
- Effective remote control, expanding possibilities in healthcare

5- Super-Efficient solar cell

Supervisor

| | |
|--------------|--------------|
| د. نبال مبرك | د. سمیه أحمد |
|--------------|--------------|

Students

| | |
|-------------------------------------|--|
| 1. احمد السيد ابراهيم محمد عبده | 6. محمد احمد محمد عبد العزيز جاد الله |
| 2. احمد سامح انور محمد فـرج | 7. محمد عادل عبد المنعم عيد عبد الواحد |
| 3. خالد حسن عبده احمد احمد المنوفي | 8. محمد عاطف احمد محمد خليفه |
| 4. عز الدين محمد حامد احمد الشربيني | 9. يوسف محمود مرزوق رجب عبد الله |
| 5. عمر شعبان السيد محمد العزوني | |

Abstract

By Improving the conditions of the environment affecting the solar cell increasing the number of flux lines falling on the cell using convex lenses, then cooling the heat generated from the focusing of light on the cell to optimum temperature we can maximize the output of the cell getting maximum efficiency. In addition, the robot includes an LDR sensor that enables it to automatically self-illuminate when the sun rises. This feature ensures the robot remains visible and operational during daylight hours, enhancing safety and visibility for pedestrians and other sidewalk users.

To effectively navigate its surroundings, the robot is equipped with an ultrasound sensor. This sensor allows the robot to detect obstacles in its path, enabling it to autonomously avoid collisions and complete coloring tasks without interruption. This ability to detect obstacles ensures efficient operation and reduces potential damage to both the robot and its environment.

Integrating a Color Sensor allows the robot to know whether the sidewalk is colored or not. This data provides valuable insights into the painting process. Taking into account this data, the robot can decide to stop painting to ensure painting results.

6- Design and implementation of Stairs Climbing Wheelchair

Supervisor

د. أسماء عطيه

د. رضا الششتاوى

د. احمد هانى

Students

1. أسـر محمد عـلاء الدين ابراهيم جاد الله
2. عبد الرحمن احمد محمد محمود
3. عبد الرحمن محمد عبد الفتاح فرج خضر البيير
4. مصطفى عوض ابوهـلب
5. مصطفى محمد الطاهر ابراهيم
6. يوسف محمد محمود عبد السلام

Abstract

This proposal outlines a project focused on the design and implementation of a stairs climbing wheelchair. The project aims to address the challenges faced by wheelchair users in navigating staircases, with the purpose of enhancing their mobility and independence. By developing an innovative solution, this research endeavor strives to contribute to the field of assistive technology and improve the quality of life for individuals with mobility impairments. Wheelchair users encounter significant difficulties when confronted with staircases, as traditional wheelchairs are primarily designed for level surfaces. The inability to independently traverse stairs restricts their freedom of movement, limits access to various environments, and poses safety risks. Existing solutions such as stair lifts, ramps, and assistance from others have certain limitations, including high costs, time-consuming setups, and impracticality in certain scenarios. Therefore, there is an urgent need for the development of a reliable, efficient, and user-friendly stairs climbing wheelchair.

The purpose of this project is to design and implement a stairs climbing wheelchair that enables individuals with mobility impairments to independently ascend and descend staircases. The proposed wheelchair should provide a safe, stable, and comfortable

experience while addressing the unique challenges posed by different types of stairs. The primary objective is to enhance the mobility and independence of wheelchair users, enabling them to access a wider range of environments with ease.

Adapting double tracked mechanism ,After thorough evaluation on concepts of different stair climbing mechanisms, it is found that the integration of double tracked mechanism with tri-wheel belt drive system is the more stable and economical solution. The design is based on six wheels distributed on the sides and every three wheels surrounded by a belt ,Two electric motors ,battery and hydraulic system

7- Design and implementation of 3d printer and scanner with recycling

Supervisor

د. محمد البوريدي

د. أميره البطوطي

د. رضا الششتاوي

Students

1. كيرلس حاسم رشاد لبيب

2. ميار محمد عبد القادر حسن سليمان

3. مينا اشرف كامل جرجس بسطوروس

4. مينا رافت نعيم تادرس ايوب

5. نور الدين ايمن محمد السيد محمد عمار

6. هادي عبد الحميد بسيوني عبد الله النحاس

6. هادي ناجي هادي ناجي ناجي مصطفى غنيم

7. محمد عبد المنعم سعد ميهره (الالكترونيات)

8. مصطفى رمضان عبد الهادي محمد (الالكترونيات)

9. يوسف حسام الدين محمد سليمان العزب (الالكترونيات)

Abstract

In this project we aim to recycle materials for 3D printing to reduce environmental pollution and wastes converting it to create unique things. Also, we can use special kind of bottle's which have been recycled many times and can't be used any more. So, we can make those bottles' useful by using them in recycling throughout a compatible system have 3 main divisions:

Recycling & Scanning and Printing

1. Recycling: -

The Polyform is an open-source machine that recycles plastic bottles into 3D printer filament.

2. 3D Scanner: -

photogrammetry relies on using a data set consisting of photographs of the same physical object. In this paper are evaluated different 3D models generated from the same input data set by specialized software packages for photogrammetry. The main attributes of the 3D models are examined in comparative analyses and their differences highlighted.

3. 3D Printer: -

3D printers are distinguished from other configuration and manufacturing technologies in that they provide easier, faster and less costly solutions, as well as allowing the design of complex configurations that need to overlap many normal manufacturing processes.

8- Design and Implementation of Smart Agriculture Robot

Supervisor

د. أحمد شطا

د. أسماء عطيه

د. عمرو نصر الدين

Students

- | | |
|---------------------------------------|--------------------------------------|
| 1. ابراهيم احمد ابراهيم احمد ابوشاهين | 6. ادهم اشرف محمود عبد الرحمن |
| 2. احمد ايهاب جلال عبد المقصود عتلم | 7. اسلام جابر السيد محمد عبد الله |
| 3. احمد سعد عبد المولى | 8. اسلام عمر محمد محمود هبالة |
| 4. احمد عطيه محمد حسين | 9. محمد مصطفى احمد سليمان درويش |
| 5. احمد محمد عبد الوهاب حامد محمد | 10. محمود خليل عز الدين خليل ابراهيم |

Abstract

The Smart Agriculture Robot project aims to revolutionize the agricultural industry by introducing advanced robotic systems capable of performing various tasks autonomously. With the increasing demand for food production and the challenges faced by traditional farming methods, there is a need for innovative solutions that can enhance efficiency, productivity, and sustainability.

- The project focuses on developing a versatile robot that can navigate through agricultural fields, plowing the field, sowing seeds, and covering the seeds with soil. The robot will be equipped with a combination of sensors to gather data and make informed decisions in real-time. This agriculture robot will optimize resource utilization, reduce labor costs, and minimize environmental impact. It will be capable of adapting to different terrains, weather conditions, and crop types, ensuring optimal performance across various agricultural settings.

9- Design and implementation of brackish water Ro desalination unit power by solar energy and recovery energ

Supervisor

د. أمنيه جودت

د. أسماء عطيه

د. أحمد هاني

Students

7. كريم السيد عبد السميع جبريل عبد الرحمن
8. ماريننا عماد عياد ميخائيل
9. محمد الشاذلي محمد عثمان
10. محمد حسن محمد حسن ابو العيد
11. محمود سامي محمود احمد محمود ناجي

1. سهيله عبد الحميد محمد عبد الحميد مهينه
2. عمر جمال المرسى
3. عمر سعد متولى
4. عمرو السيد عيد السيد شحاته
5. عمرو عبد الحميد اسماعيل ابوحميد
6. كارين محمد احمد محمد

Abstract

The shortage of sufficient available of fresh water resources in Egypt to meet water needs forces the nation to look for new water supply sources also to meet the increasing demand for fresh water. In this project, a case study for designing, optimizing and implementing an off-grid water desalination system using RO method of desalination

This Grid will be design to produce fresh water and installed at the mouths of rivers. The system operates the pumping system as well as the reverse osmosis based desalination unit.

A measurement system has been collected relevant data like temperature, radiation, voltage, current, water quality, pressure, etc.

This Grid consists of three stage, The first stage, before treatment using RO, removes impurities and improves color using a filter and getting rid of dust, The second stage is treatment using RO, in which salts and organic materials are removed, and also using UV, in which viruses and bacteria are removed, so that the water is suitable for drinking , The third stage, when the amount of salt is acceptable returned to first tank to re treatment and when the amount of salt is large, it is extracted and used in agricultural crops, fish, and flat areas with wide areas and short depths ,this Grid powered by renewable energy (turbine) and clean energy (solar energy)

10- Solar Powered Smart Wheelchair controlled by Voice commands, Android app and Joystick Students Supervisor

Supervisor

د. أحمد نور

د. هشام عابدين

Students

- | | |
|---------------------------------------|---------------------------------------|
| 1. احمد السيد سعد حبيب | 6. محمد على عبد اللاه عبد الحميد احمد |
| 2. احمد رشدى عبد التواب محمود زيد | 7. مصطفى رشاد سعد محمد ابومندور ودين |
| 3. ادهم شريف عبد الحميد حماد الخامى | 8. مصطفى سعد شعبان حسن عثمان |
| 4. عبد الغفور محمود عبد الغفور الماحى | 9. مصطفى عبد الحليم محمد خضر |
| 5. محمد طارق كمال وهبة عبد الحليم | 10. محمود اسامه السيد محمد جاد الله |

Abstract



Introducing the state-of-the-art smart wheelchair, designed to revolutionize the mobility experience for individuals with limited mobility. This advanced wheelchair incorporates cuttingedge technology, combining voice command and joystick control for enhanced maneuverability and accessibility. One of the standout features of this smart wheelchair is its unparalleled safety functions. With the integration of ultrasonic technology, the wheelchair has an anti-collision system that detects obstacles in its path, preventing potential accidents and ensuring the user's safety. Furthermore, this intelligent wheelchair goes beyond the traditional functionalities by incorporating a range of health monitoring features

11- Design and Fabrication of a Smart equilibrium Maintainer

Supervisor

د. أمل صالح

د. أسماء عطيه

د. أحمد هانئ

Students

5. كرسيتين كميل عطا حزين جرس (الالكترونيات)
6. روان تامر عاطف على حسن(حاسبات)
7. سلمى اسامه محمد عبد الحافظ الحداد(حاسبات)

1. ابراهيم عبد الرحمن فهمى الطححان
2. ردينه ابراهيم محمد مرسى سبجد
3. رواء محمد محمد محمد
4. زياد شوقي السيسى

Abstract

As The goal of the "Smart Equilibrium Maintainer" project is to create a device that improves ankle joint proprioception and reduces basketball player injuries by enhancing proprioceptive awareness and balance. The device allows for controlled tilting in both the X and Y axes. It consists of an upper platform and a lower platform connected by a 4-bar linkage and springs, including Nema 23 stepper motors, TP6600 motor drivers, and an Arduino controller are among the mechanical and electrical parts it has. The platform's movement helps simulate various balance exercises. Anterior Cruciate Ligament (ACL) tears can be avoided by practicing balance exercises, which are aided by the movement of the platform. using the help of a mobile application created using Flutter and Dart, the project combines mobile control, giving athletes an easily accessible and useful training aid. The device's specifications include a maximum load capacity of 30 kg, a body weight of 30 kg, and a maximum speed of 1500 rpm, making it a robust and efficient solution for enhancing athletic performance and safety.

12-Development of smart aquaculture farm management system

Supervisor

د. مروه خضري

د. سهى جاب الله

د. حسن الشوباشي

Students

- | | |
|---|--|
| 6. فـادى نبيـل مقبـول | 1. ابوزيد صبحى عبد الحليم |
| 7. فرحـه حسـام الدين حمـاد حافظ رضوان | 2. احمد حمدي صلاح عبد الله بدوى |
| 8. مريم محمد احمد محمد | 3. احمد كمال فوزى برغش |
| 9. مصطفى محمد عبد الغنى محمد عبد الغنى | 4. ثابت محمد ابو المعالى |
| 10. محمد ابراهيم عشاوى ابراهيم (الالكترونيات) | 5. جمال علي حامد ابراهيم |
| | 6. زياد احمد عبد المنعم ابو اليزيد شوارب |

Abstract

This project focuses on developing an automated water quality monitoring and purification system utilizing an Arduino-based platform. The system incorporates four sensors to measure key water quality parameters: temperature, total dissolved solids (TDS), pH, and turbidity. These sensors continuously relay data to an Arduino microcontroller, which also controls a motor that circulates water through reverse osmosis (RO) and Ultrafiltration (UF) filters before returning it to the tank. A flow meter sensor monitors the output flow rate from the motor. Real-time readings from all sensors are displayed on a TFT screen and transmitted via a Bluetooth module to a mobile application. The mobile application not only displays these readings but also allows users to control the motor through a relay module and record sensor data into a Google Sheet at the touch of a button. This closed-loop system ensures continuous purification and monitoring, providing a robust solution for maintaining high water quality.

13- Electrical Power planning and Distribution for a hospital using solar energy for feeding

Supervisor

د. حسناء محمد

أ.م.د. لمياء عبد الله

Students

6. علاء الدين محمد محمد عبد الحميد الابيارى
7. محمد السيد ابراهيم مصطفى
8. محمد محمد سعد عبد الجواد
9. يوسف عمر عبد القادر عبد الفتاح الدرس
10. ايمان نعيم حسن غازى (الالكترونيات)

1. ابوبكر عز الدين عبد العال عثمان على
2. احمد عبد الحميد سلامه محمود
3. احمد محمد عبد الله حسن نعيم
4. رنا احمد محمد حسن
5. طارق محمد محمد المسلمانى

Abstract

In this project, the main target is to design the distribution a completely perfect and advanced Electrical distribution system according to code standards. In order to achieve our vision, we should take into consideration three main important factors: time, quality, and cost. The main goals are to achieve the optimal power distribution for the hospital, power reduction, low cost, reducing cables lengths, finally, choosing the suitable insulation material for cables according to environmental conditions and the Egyptian code. However, improving IP for protection of electrical equipment, choosing suitable circuit breakers according to the loads and using LED components for their long lifetime.

14- Solar Playfield marking robot

Supervisor

د. سميه أحمد

د. حسن الشوباشي

Students

7. زياد عادل جبر هاشم
8. محمد السيد غريب محمد حافظ عبد المعطي
9. معتز محمد شكرى عامر
10. يحيى عصام محمد عماد الدين
11. يوسف مصطفى يوسف عبد الحميد توتو

1. ابوبكر اوام محمد كمال خميس
2. باهر نبيل لطفى عبد الملاك
3. بيشوى سمير عطفا
4. جابر محروس ابراهيم ابراهيم
5. جورج اديب يعقوب
6. جون ناجى بشورى فهمى

Abstract

This project presents an innovative solution for marking sports fields: a solar-powered, energy-efficient stadium marking robot. This autonomous robot uses solar energy to address the limitations of traditional field marking methods, which can be time-consuming, labor-intensive, and rely on non-renewable resources. The robot is equipped with a distance and angle marking system, allowing for precise and consistent line application on different types from the fields. Solar panels on the robot's body convert sunlight into clean electricity, powering the robot and eliminating dependence on fossil fuels. This not only reduces the environmental impact of field maintenance, but also reduces operating costs. This project has the potential to revolutionize field maintenance. By combining solar power and autonomous operation, the solar-powered, energy-efficient play field marking robot provides an environmentally friendly, cost-effective, and time-saving solution for sports facilities, enhancing sustainability and efficiency in maintaining play fields.



معهد الإسكندرية العالي للهندسة والتكنولوجيا
كُتيب مشاريع التخرج للعام الجامعي 2023-2024

| Industrial Engineering Department (IE) | |
|---|--|
| 1 | Solar-Powered Trade Mill Rehabilitation Device . |
| 2 | Automated Magnetic Metal Separation Machine. |

1- Solar-Powered Trade Mill Rehabilitation Device

Supervisor

د. هبه الحداد

أ.م.د. يسرا حمدي

أ.م.د. قاسم قدری

Students

1. جولیان جندي عبد الشهيد

2. عبد الرحمن محمد فتح الرحمن

3. عمر محمد علي النشار

4. محمد خالد محمد

5. محمود عبد الرحمن سيد عبد الرحمن هلال

6. مصطفى احمد على عبد الرحمن

Abstract

Rehabilitation programs are a crucial part of medical therapy for individuals suffering from limb muscle atrophy, since they help them progressively regain their ability to move of motion. Nonetheless, several patients find it extremely challenging to adhere to rehabilitation plans offered by specialized rehabilitation clinics. This is since these centers could not be accessible where they live, or they cannot afford their costs, or because of the severe difficulties they must face making regular visits to the center due to their physical impairment. The goal of this project is to create a solar-powered, home-use rehabilitation device with an attached chair specifically designed for those with mobility difficulties. The device serves as a comprehensive rehabilitation system for assisting disabled patients to gradually regain muscle strength and coordination, fostering a more effective rehabilitation process. In addition, the device ensures patient safety by monitoring the essential physiological parameters during rehabilitation sessions. In addition, the device incorporates multiple monitoring sensors to provide real-time feedback on the patient's vital signs, aiding healthcare professionals in adjusting the intensity and duration of the rehabilitation exercises based on individual needs. On the other side, the



معهد الإسكندرية العالي للهندسة والتكنولوجيا كُتيب مشاريع التخرج للعام الجامعي 2023-2024

solar-powered nature of the device offers several advantages, including reduced dependency on external power sources. As a result of this effort, a more economical, sustainable, and adaptable solution that may be used in distant or resource-constrained places has been developed. This project is in line with Egypt's Vision 2030 since it satisfies Sustainable Development Goals 3, 7, and 9.

2- Automated Magnetic Metal Separation Machine

Supervisor

| | | |
|-----------------|---------------|---------------|
| د. سهى جاب الله | د. سامح توفيق | د. هبه الحداد |
|-----------------|---------------|---------------|

Students

| |
|-------------------------------|
| 1. ابراهيم حسانين محمد السعيد |
| 2. احمد ابراهيم محمد |
| 3. احمد عنتر مرسى عبد لعال |
| 4. محمد حسن محمد محمود سيد |
| 5. محمد هاشم شـعبان جاد الله |
| 6. ممدوح انور ممدوح الخولى |

Abstract

Metal waste resulting from the manufacturing process represents a major problem on both the environmental and economic levels. From these wastes is iron waste, which is the most common industrial waste that must be effectively collected to be recycled for reuse. This project aims to efficiently separate magnetic materials from a pile of mixed materials. The developed machine uses a magnetic conveyor belt and is controlled by an Arduino microcontroller through a mobile application, to automate the separation process. In addition, the system includes RFID technology for safe operation by authorized persons. The project is consistent with the Egyptian Sustainable Development Agenda 2030 as it relates to recycling and waste management as key aspects serving Goal 11.6 of the Sustainable Development Goals also adopts the concept of technology transfer and localization, which serves Goals 9.5 and 9.b of the Sustainable Development Goals. As a result of these efforts, a more economical and sustainable solution for separating ferrous wastes with high efficiency has been developed for use in small to medium manufacturing workshops.

معهد الإسكندرية العالي للهندسة والتكنولوجيا

Alexandria Higher Institute of Engineering & Technology



Electronics and Communications
Engineering Department

ECE

Computer Engineering
Department

CE



Mechatronics Engineering
Department

EME

Industrial Engineering
Department

IE



www.aiet.edu.eg



info@aiet.edu.eg



[aiet.edu.eg](https://www.facebook.com/aiet.edu.eg)



[aiet.edu.eg](https://www.instagram.com/aiet.edu.eg)

تليفون 4254370 (03) - 4254380 (03)
فاكس 4254942 (03)
الرمز البريدي 21211

شارع الدكتور محمد ابو الفتوح حساب
متفرع من شارع فيكتور عمانويل الثالث
سموحة الاسكندرية