American International University-Bangladesh (AIUB)

SDG Activity Report 2023

SDG 11: Sustainable Cities and Communities

Make cities and human settlements inclusive, safe, resilient and sustainable

American International University-Bangladesh (AIUB) is dedicated to contributing to Sustainable Development Goal 11 through initiatives that promote sustainable cities and communities. AIUB organizes student visits to significant cultural sites such as the Liberation War Museum and Panam City, fostering an understanding of heritage conservation.

The university encourages students to engage in projects aimed at preserving local heritage and improving urban infrastructure. For instance, AIUB's community development project at Jamdani Village focused on improving local living standards. Additionally, students from the Department of Architecture participate in activities like the "Design Dialogue" exhibition, which integrates sustainable design principles in urban development.

AIUB promotes sustainable practices both on and off-campus. The university provides green spaces designed to reduce carbon footprints. Moreover, AIUB's research, including projects like the "IoT-Based Smart Cities for Sustainable Development", focuses on using innovative technologies to improve urban planning and infrastructure.

AIUB also ensures inclusive development, addressing the needs of marginalized communities through the "Transforming Slum Dwellings" initiative, which aims to provide better living conditions for underprivileged residents. Through these comprehensive initiatives, AIUB contributes significantly to SDG-11 by fostering sustainable, inclusive, and resilient urban environments.

#AIUB #SDG11 #SustainableCities #CommunityDevelopment #CulturalHeritage

Contents

University Activities towars SDG 11 7

ARCHITECTURE STUDENTS VISIT THE LIBERATION WAR MUSEUM 7

Study tour to Panam City 8

MMC students visited and participated in a community development project at Jamdani Village, Bargaon, Sonargaon 9

“DESIGN DIALOGUE” [SPRING 2022-23]: THESIS JURY BY ARCHITECTURE STUDENTS . 10

DESIGN DIALOGUE: SUCCESSFUL COMPLETION OF ARCHITECTURE THESIS JURY 11

Architecture Department organizes Student Project Exhibition 12

ACES organized a seminar on ‘3D Silicon Sensors’ 13

DEPARTMENT OF ARCHITECTURE HOSTS WORKSHOP ON AI AND ARCHITECTURE 14

Achievements of EEE Students & Teachers at the International Conference on Electronics and Informatics (ICEI) 15

DWm4 RECENT WORKS: HOSTED BY DEPARTMENT OF ARCHITECTURE 16

AIUB PHOTOGRAPHY CLUB (AIUBPC): WORKSHOP IN COLLABORATION WITH BCPA . 17

Faculty of Engineering organized workshop on “Research Methodology.” 18

THM Field Trip to Chuti Resort, Gazipur 19

Faculty Research and Publications on SDG 11 20

The Fourth Industrial Revolution and Beyond 20

The Fourth Industrial Revolution and Beyond 20

Design and Implementation of Smart Drainage System for Bangladesh 20

Smart Roads: Lighting the Way to Safety and Efficiency 21

IoT Based Air Quality and Noise Pollution Monitoring System 22

An IoT Based Smart Grid: Peer-to-peer Energy Trading for Electric Vehicles Using M2M Communication Technology 22

Design and Implementation of Smart Drainage System for Bangladesh 23

International Conference on 'Rivers of South Asia: Connecting Ecology, People, and Governance' 23

IoT Based Power Monitoring and Management System of A Distribution Substation 23

Design and Implementation of Smart Cities for Sustainable Development 24

Design, Simulation, and Implementation of a Surveillance Robot System 25

Design, Simulation, and Implementation of a Home Automation System using Arduino Microcontroller 25

Ammonia & CO2 Gas Detection of Poultry Farms and Compost Plants by Low-Cost Smart Sensing System 25

Enhancing Urban Mobility: An Adaptive Traffic Signal System for High-Density Cities 26

Design, Simulation and Implementation of a Self-Serviced Vending Machine for Drinks Using an Arduino Microcontroller 26

IoT-Based Smart Poultry and Fish Farming System Using Arduino 27

Microcontroller-Based Embedded System Design and Implementation towards Sustainable Development Goals 27

Emission and Valve Point Loading Cost Using Superiority of Feasible Solutions-Moth Flame Optimization 28

Isolation Forest-Based Anomaly Detection and Fault Localization for Solar PV System . 28

Optimized Energy Management of Grid Connected Solar/Battery-dependent Smart Microgrid 29

Investigating Clean Energy Generation from Unoccupied Roof-top Space in University Premises 29

Prospects and Economic Feasibility Analysis of Solar PV/Hydrogen Fuel-based Power System for Green City 30

Grid-tied Smart Microgrid with Heuristic Optimized Energy Management System (EMS) 30

Enhanced Optimum Design and Performance Evaluation for Grid-Connected Solar PV Rooftop Systems: A Case Study for Bangladesh 31

GSM-based Automatic Voltage Protection System for Residential Small Appliances 31

Enhancing DDoS Attack Detection Using Machine Learning: A Framework with Feature Selection and Comparative Analysis of Algorithms 32

The Role of Scientific Research Publications on Sustainable Sectoral value Addition and Economic Growth in Bangladesh 33

Prediction of Flood in Bangladesh Using Different Classifier Model 33

IoT-Based Smart Battery Management and Monitoring System for Electric Vehicles 34

Computer Vision-Based IoT Architecture for Post COVID-19 Preventive Measures 34

Utilization of Machine Learning Strategies in the Investigation of Suspected Credit Card Fraud 34

Smart Trash Collection System – An IoT and Microcontroller-Based Scheme 35

Rohingya Refugee: A Challenge of Humanitarian Crisis and Ways Forward 36

Machine learning enabled IoT system for soil nutrients monitoring and crop recommendation 36

Utilization of Machine Learning Strategies in the Investigation of Suspected Credit Card Fraud 37

Blockchain based Agriculture Using the Application of UAV and Deep Learning Technique: Alexnet CNN 37

Assessing the Connectivity of Community Parks and Fields to Understand the Propensity of Use by the Neighborhood: A Case at Uttara Residential Area, Dhaka 38

Transforming Slum Dwellings into Better Livable Units: An Approach through Minimum Intervention 38

Transforming Slum Dwellings into Better Livable Units: An Approach through Minimum Intervention 39

DSC Index: Measuring the Digital Supply Chain Practice among the Higher Education Institutions Community in Least Developed Countries 39

IoT-Based Automated Solar Panel Cleaning and Monitoring Technique 40

Design and Concept of Renewable Energy Driven Auto-Detectable Railway Level Crossing Systems in Bangladesh 40

The Impact of User Participation on the Success of Enterprise Resource Planning (ERP) Adoption in Bangladesh 41

Design and Analysis of IoT-Based Battery Management and Monitoring System for Electric Vehicle 42

Detection of Traffic Rule Violations Using Machine Learning: An Analytical Review 42

IoT Based Single Identification Database Model For Under Development Countries 42

International and Bangladesh Perspective of Electronic Waste Management: Some Solution Proposals 43

Enhancing Elderly Healthcare Access in Smart Cities: A Pathway to Inclusive Wellbeing 44

Three Phase Fault Analysis using Thermal-Magnetic Circuit Breaker and Overcurrent Relay 44

Smart Power Systems for Smart Cities: Architectural Development and Economic Performance Assessment 44

An IoT-Enabled Microbial Fuel Cell for Wastewater Treatment and Enhancing Hydroponic Systems: An Eco-Friendly Renewable Energy Development 44

Smart Monitoring and Control of Water Purification System Using UF Membrane Filtration 45

University Activities towars SDG 11

ARCHITECTURE STUDENTS VISIT THE LIBERATION WAR MUSEUM

First and second-year students of the Architecture department visited Liberation War Museum at Agargaon, Dhaka, on February 10, 2023. This trip aimed to inspire the students to learn the application of basic composition in a building. Students have experienced the principles of composition and rules of organization in contemporary architecture designed by architect Tanzim Hasan Salim. Form generation, solid-void relationships, and converting this knowledge to generate space at a real scale were the main learnings from this architecture for the first and second-year students. This study trip was conducted by Ajmeri Nusrat Shoma (Senior Assistant Professor), Irfat Alam (Assistant Professor), Nazifa Zabeen Siddiqua (Assistant Professor), Tarek Morad (Assistant Professor), and Nushrat-e-Hoque (Lecturer) under the courses Design Studio II and Design Studio IV.

Ar. Tanzim Hasan Salim accompanied the tour. His presence made the trip more successful as he talked about the whole development of the building, from conceptualization to its construction method. Furthermore, he briefed the formal expression of the building, spatial quality, and structural solution. The knowledge from this magnificent architecture will enrich the students, help them in studio projects and motivate them in their future professional life.

The study trip to the museum was possible because of the support from the Liberation war museum authority, architects, faculties, and AIUB administration. This tour highly motivated the faculties and the students to have similar trips in the future.

https://www.aiub.edu/architecture-students-visit-the-liberation-war-museum

Study tour to Panam City

Students of the Faculty of Arts and Social Sciences (FASS) of AIUB went on a study tour at the Panam's beautiful and ancient city in Narayanganj on 25th February 2023. Ms. Farhana Afroz and Mr. Niaz Majumdar, Faculty Members of FASS organized the field trip for the students of Bengali Language, and Literature and Art & Aesthetics courses of the Department of Media and Mass Communication.The Panam City, also known as Panam Nagar, is a historical attraction of Bangladesh for its old architecture located at Sonargaon, Narayanganj. The city bears the memory of Isa Khan, one of the twelve Bhuiyas and the ruler of Bengal. This small city was then known as the capital of Isa Khan during the 15th century, and some memories of that era still remain. This place is also known as the lost city of Sonargaon. In 2006, World Monument Fund declared Panam Nagar as one of the 100 ruinous historical establishments.It is one of the old capitals of the historic region of Bengal and was an administrative center of Eastern Bengal. It was also a port and trading center. During British colonial rule, merchants built many Indo-Saracenic townhouses in the Panam neighborhood. Sonargaon was central to the muslin trade in Bengal.During the era of British ruling, Panam nagar was occupied by Hindu merchants and traders. They built the current old edifies there that time (probably early 19th century or late 18th). The houses were all around in a same place having a road in between which is around 600 meters in length. At the either side of the city two canals are seen (which were probably built to protect the city).The Sonargaon museum is located nearby. People who visit Panam city also visit the museum before or after. The museum has several displays for visitors to help them to know more about the history and culture of Bangladesh.anam Nagar is an exceptional and extraordinary example of linear urban settlement that simultaneously combines Bengali and European architecture. A comprehensive approach is essential to preserve our 'Living Heritage'.Students photographed the old city scene. They capture the great archaeological remains of Panama City as well as the history.

https://www.aiub.edu/study-tour-to-panam-city

MMC students visited and participated in a community development project at Jamdani Village, Bargaon, Sonargaon

The Media and Mass Communication (MMC) students of the American International University-Bangladesh (AIUB) participated in a community development project at Jamdani Village, Bargaon, Sonargaon, under the guidance of Senior Faculty Mr. Niaz Majumder of MMC department on July 15, 2023.

The workshop was organized by the Summer 2023 BLC Field School Bangladesh Chapter and was titled: “Story of Jamdani People and Place, Bargaon”. The objective of the workshop is to document the cultural landscape and stories of Jamdani people and places. At the end of the day students have gained knowledge to document the environment and cultural landscapes of local communities, how to write local histories of people and places "from the ground," and gleaned materials through hands-on activities.

In the concluding session, Mr. Niaz Majumdar presented an interesting topic from his research paper; Maa & Mati – “Terracotta our culture! Our heritage”, in the context of art and architecture of Bangladesh. Thanks to architect Dilruba Ferdous Shubhra, (former faculty of AIUB, Department of Architecture), for her kind invitation to this wonderful Field work projects and a resourceful event.

https://www.aiub.edu/mmc-students-visited-and-participated-in-a-community-development-project-at-jamdani-village-bargaon-sonargaon

“DESIGN DIALOGUE” [SPRING 2022-23]: THESIS JURY BY ARCHITECTURE STUDENTS

The Department of Architecture, AIUB, has successfully completed the Thesis Jury of final-year undergraduate students (Spring 2022-23 semester) from 30th May to 1st June 2023 at the Multipurpose Hall of Annex-7, AIUB permanent campus. The spontaneous participation and presence of faculties, students, and guest jurors made this event a memorable one.This year, a total of thirty-five students presented their final-year studio projects, which ranged from futuristic design approaches to realistic problem-solving on contemporary urban, architectural, environmental, and cultural issues. AIUB Architecture Department has always been a liberal platform for students to explore unconventional and unique ideas to the fullest. Students have worked hard on their individual projects throughout the semester under the guidance of the studio mentors - Ar. Hasan Ahmed Chowdury, Ar. Farzana Siddiqua and Ar. Rashed Hasan, along with great encouragement and support from the Head, Ar. M. Arefeen Ibrahim and the thesis supervisors.A good number of invited external jurors were present during the event, including renowned architects, academicians, engineers, and researchers, including Ar. A B M Mahbubul Malik (Professor, AUST), Ar. Mohammed Emran Hossain(Design Principal, Architect Emran & Associates), Dr. Md. Nawrose Fatemi (Associate Professor & Head, University of Asia Pacific), Ar. Lutfullahil Majid (Partner Architect, Archeground Limited), Ar. Jubair Hasan (Principal Architect, Jubair Hasan Architects), Ar. Dilruba Ferdous Shuvra (Adjunct lecturer, TA, and PhD Student, University of Wisconsin, Milwaukee, USA), Ar. Tahmida Afroz (Advisor, Collector (Art) Management, Researcher, Bengal Foundation), Engr. Mr. Shamsul Alam (Structural Engineer, TDM), Ar. Amit Kumar Saha (Partner, Vastuvita Architects), Ar. Neaz Sharif (CEO, Aline Architects and, Engineer) and the Faculties of Architecture Department, AIUB. Their valuable comments and discussions during the jury session facilitated the students to comprehend different perspectives, complications, and possibilities of their projects. The projects received positive remarks, commendations, and constructive criticism from the jurors based on their concepts and design merit.The three-day jury sessions ended with a cordial note from the Studio mentors applauding the fresh graduates moving towards a new chapter of their lives. Successful public events like these are essential to ensure wider exposure and better job opportunities for graduating students. This also helps to establish a profound connection between academia and practice. Department of Architecture is thankful to the external and internal jurors, student participants, and the University Administration for their support and would like to take this opportunity to wish a very bright, prosperous future to the newly graduated architects of AIUB.

https://www.aiub.edu/design-dialogue-spring-2022-23-thesis-jury-by-architecture-students

DESIGN DIALOGUE: SUCCESSFUL COMPLETION OF ARCHITECTURE THESIS JURY

The department of Architecture, AIUB, has successfully completed the Thesis Jury of final-year students from Fall 2022-23 on the 17th & 18th of January 2023 at the Multipurpose Hall of Annex-7 Building. All faculties, students, and guest jurors spontaneously participated and appreciated the event.

In this event, a total of twenty students presented their final year design studio projects, covering a wide range of topics on contemporary urban, architectural, and environmental issues. The students worked hard on their individual projects throughout the semester under the guidance of Studio mentors Ar. Ashik Vaskor Mannan and Ar. Tarek Morad, along with great encouragement and support from the Head - Ar. M. Arefeen Ibrahim and their thesis supervisors.

The Jury Panel was adorned by invited external jurors - esteemed architects and academicians, including Dr. Mohammad Ali Naqi (Former VC, Stamford University; Vice President, IAB), Ar. A B M Mahbubul Malik (Professor, AUST), Ar. Md. Ehsan Khan (Principal Architect, Ehsan Khan Architects Ltd.), Ar. Farhana Sharmin Emu (Former GS, IAB), Ar. Sarah Bashneen (Chairman & Associate Professor, Stamford University), Dr. Md. Nawrose Fatemi (Associate Professor & Head, University of Asia Pacific), Ar. Shah Fuad Mahammad Cyrus (Principal Architect, CSA), Ar. Nabi Newaz Khan Shomin (Partner Architect, Archeground Limited), Ar. Lutfullahil Majid (Partner Architect, Archeground Limited), Ar. Jubair Hasan (Principal Architect, Jubair Hasan Architects), Ar. Mahmudul Hasan Forhad, Tahmina Rahman (Lecturer, University of Asia Pacific), Ar. Saad Ben Mostafa (DOA, PWD) and the faculties of the Architecture Department. The projects received positive remarks, commendations, and constructive criticism from the jurors based on their concepts and design merit.

Successful public events like these are essential to ensure wider exposure and better job opportunities for graduating students. This also helps to establish a profound connection between academia and practice. The Department of Architecture is thankful to the external and internal jurors, student participants, and the university administration for their support and would like to take this opportunity to wish a very bright, prosperous future to the fresh architects of AIUB.

https://www.aiub.edu/design-dialogue-successful-completion-of-architecture-thesis-jury

Architecture Department organizes Student Project Exhibition

A day long Student Studio project exhibition of "Design Studio I Fall 2022-23" of the Department of Architecture was held in Annex 7, Multipurpose - hall from 10:00 am to 5:00 pm, Thursday, 15th December 2022.

The Head of the Department, M. Arefeen Ibrahim, inaugurated the exhibition for faculty members and students to observe the ingenious architectural projects generated by the freshmen students of Design Studio I of Architecture Department. The student projects were designed under the supervision of the studio guides. The exhibition was possible because of the spontaneous hard work of the students and respective teachers Ashik Ikbal, Farzana Siddiqua, Fauzia Mouri and Nushrat-E-Hoque. All the faculty members of the department were present during the exhibition.

Since the establishment of the Department, the first year students of the Architecture Department, established a trend of organizing exhibitions each semester, to showcase their innovative design ideas. The goal of the exhibition is to provide students with a platform where they can share their ideas to academic experts to receive feedback for future enhancement. Additionally, it motivates other students of the department and gives them recognition as a whole to build a sense of responsibility towards the Department.

The presentation skill of the students and the main attraction of the event was the graphical representation of the painting “Liberation War” of Painter Shahabuddin Ahmed and other compositional models of the projects were highly appreciated by the spectators. The event was concluded by a delightful performance from the students and faculty members on stage. The exhibition remained open for all till 5:00 pm on that day.

https://www.aiub.edu/architecture-department-organizes-student-project-exhibition

ACES organized a seminar on '3D Silicon Sensors'

On July 16, 2023, the AIUB Community of Engineering Students (ACES) organized a seminar titled '3D Silicon Sensors: Solution to the high radiation Environment as the innermost tracker of the ATLAS Detector'. The program started at 4:00 pm with 40 pre-registered participants at Annex 3, AIUB. The seminar aimed to provide an overview of the ATLAS detector, silicon sensor, 3D sensor, particles, and radiation detectors. This solution will contribute to achieving the required power generation to make sustainable cities and communities.

Prof. Dr. ABM Siddique Hossain (Dean & Professor, Faculty of Engineering, AIUB), inaugurated the event, and discussed the importance and present-day scenario of nuclear science and material science, and provided insights into the working field of CERN. Following that, the honorable speaker, Alumnus of Department of EEE, AIUB Dr. Md. Arif Abdulla Samy (Post-Doctoral Researcher, TIFPA-INFN, Research Associate, CERN), began his speech by providing a brief overview of the Atlas Detector and the institute that researches Atlas, CERN (European Organization for Nuclear Research). He also explained how the 3D sensors work, their design, and wafer layout. Furthermore, he discussed the opportunities at CERN for students and career development. Then, a short Q/A session was held for the participants. Dr. Md. Saniat Rahman Zishan (Director & Associate Professor, Faculty of Engineering, AIUB) concluded the seminar by thanking the speaker and presenting a token of appreciation.

https://www.aiub.edu/aces-organized-a-seminar-on-3d-silicon-sensors

DEPARTMENT OF ARCHITECTURE HOSTS WORKSHOP ON AI AND ARCHITECTURE

The Department of Architecture, American International University – Bangladesh (AIUB) successfully hosted a highly time-relevant workshop titled "[ARCHITECTURAL + ARTIFICIAL] INTELLIGENCE," exploring the intersection of AI [Artificial Intelligence] and Architecture on 23 February 2023, in the multipurpose hall, Annex 7 on the AIUB campus. The workshop was conducted by Associate Professor Ashik Mannan Vaskor and Lecturer Md. Rashed Hasan, both from the Department of Architecture at AIUB.

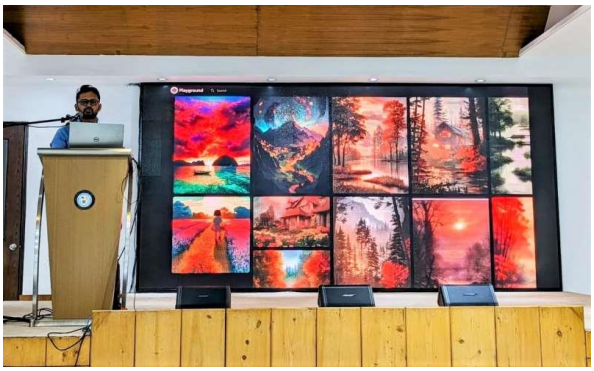
The workshop consisted of a lecture and tutorial portion, providing attendees with a comprehensive understanding of how AI is transforming the field of architecture. The lecture, entitled "AI - The Death of the Architect or a Good Tie?" was delivered by Ashik Mannan Vaskor and challenged attendees to think critically about the potential benefits and drawbacks of AI in architecture. In the tutorial portion, Md. Rashed Hasan introduced participants to different tools and techniques for using AI to aid in idea generation, including MidJourney and ChatGPT.

The workshop was attended by a diverse group of participants, including architects, designers, and students interested in the intersection of AI and architecture. Among the attendees were Department Head Mohammad Arefeen Ibrahim, Associate Professor, and almost all the architecture teachers, as well as many students and alumni.

Attendees praised the organizers for providing a thought-provoking and informative exploration of this important topic. Many commented that the workshop sparked new ideas and provided valuable insights into how AI is transforming the field of architecture.

Overall, the AIUB Department of Architecture's workshop on AI and architecture was a resounding success. The department plans to host additional events and workshops in the future, further exploring this exciting and rapidly-evolving domain.

https://www.aiub.edu/department-of-architecture-hosts-workshop-on-ai-and-architecture



Achievements of EEE Students & Teachers at the International Conference on Electronics and Informatics (ICEI)

The International Conference on Electronics and Informatics (ICEI) was organized during 26-28 January 2023 by the Bangladesh Electronics and Informatics Society (BEIS) at the Bangladesh Atomic Energy Center premises. 3 groups from Department of EEE, AIUB won the Best Poster Presenter Award out of the ten awards given from 74 accepted posters at ICEI. The members of these three groups are Rakibul Islam, Tasnuva Tawfi, Rahidul Islam Roman, Ahasanul Hoque, Sumaiya Malik, Soily Ghosh Sneha, Mubasshar-Ul-Ishraq Tamim, Sanjida Afroj Swarna, Anik Das, Abdullah Hel Adnan, MD Nazmul Sadik, Al Tausif Mamun and Tanvin Sarkar Shefat. These three groups have been supervised by Prof. Dr. Engr. Muhibul Haque Bhuyan (Professor, Dept. of EEE, AIUB). He also presented an invited talk entitled "Design and Implementation of Smart Cities for Sustainable Development". Besides, Dr. Mohammad Mostafizur Rahman Biswas (Assistant Professor, Dept. of EEE, AIUB) won the best oral session presenter award for the paper titled "Design and Modelling of LCL and LC Filters for Symmetric Five-level Inverter,". Other co-authors of this paper are A. Barik, Tamim Hossain (Lecturer, Dept. of EEE, AIUB), Muhibul Haque Bhuyan (Professor, Dept. of EEE, AIUB), and M. F. Rahman.

https://www.aiub.edu/achievements-of-eee-students--teachers-at-the--international-conference-on-electronics-and-informatics-icei

DWm4 RECENT WORKS: HOSTED BY DEPARTMENT OF ARCHITECTURE

DWM4, a widely acclaimed architectural practice in Bangladesh, graced the occasion to share their latest architectural marvels -through a captivating lecture on August 13th, 2023. The stage was the multipurpose hall of Annex 7, setting the perfect backdrop for an enlightening discourse. With an aura of innovation and power, they unveiled a kaleidoscope of contemporary works that left both the students and faculty of the Architecture Department at AIUB in awe. The hall resonated with a palpable sense of excitement as the presentation unfolded.

Originating in 1995 as Metaphor Architects, the Dhaka-based architectural practice, now known as DWm4 Architects since 2004, has carved its place in local architecture field. With a rich tapestry of design accomplishments, their journey has been nothing short of remarkable. What's even more fascinating is their seamless collaboration with DWm4 Intrends and Latitude -23, their sister concerns specializing in interior design and digital visualization respectively.

Principal architects Mamnoon Murshed Chowdhury and Mahmudul Anwar Riyaad, the masterminds behind DWm4 Architects, graced the stage with their awe-inspiring works. Their visionary insights, backed by years of expertise, painted a vivid picture of architectural innovation. The event was further graced by the welcome speech delivered by the esteemed Head of the Department, M. Arefeen Ibrahim. His words of warmth and encouragement set the tone for a truly immersive experience. The lecture wasn't merely a monologue; it sparked an intense and engaging question-answer session. Minds ignited with curiosity and eagerness, as both students and faculty probed deeper into the intricacies of the presented works.

In the end, there was an air of collective satisfaction and joy that enveloped the hall. The event wasn't just a presentation; it was an immersive journey into the architectural deliberates, made even more special by the enthusiasm and participation of everyone present. Department of Architecture is thankful to the DWm4 Architects, faculty members, student participants and the university administration for their support.

https://www.aiub.edu/dwm4-recent-works-hosted-by-department-of-architecture

AIUB PHOTOGRAPHY CLUB (AIUBPC): WORKSHOP IN COLLABORATION WITH BCPA

In collaboration with the Bangladesh College Photography Association (BCPA), the AIUB Photography Club (AIUBPC), hosted an artist talk session on Wednesday, 7 December 2022. The session was conducted by Mr. Abir Abdullah, an independent photographer and instructor at Alliance de Françoise Dhaka. The workshop began with brief introductions of the respected speaker and additional guests, including the Farhan Ahmen Rafin, the President of BCPA.

Mr. Abdullah shared his experience on photography over the years, highlighting some of the work that received recognition. He then discussed the fundamentals of photojournalism, post-processing techniques, content-oriented photography, and the risks associated with working in such a field. He showcased some of his previous works like “Death Trap”, "The Rana Plaza Accident and its Aftermath", "Bashundhara City Shopping Mall Fire", and "Different Calamities around the Country". An interactive Q&A segment was conducted afterwards, where he clarified various queries on photography from the participants. A "Single-Day Photo Contest" was also arranged during the three-day activation prior to the workshop, in which AIUB students submitted their own photographic work and selected winners were awarded with crests.

The facilitator and members of BCPA all expressed their thoughts on the event, encouraging the young generation to follow through on their interest in photography and build a stronger purpose of bringing about positive change through it. Mr. Ameen was presented with a token of appreciation by AIUBPC, with the hope of more such collaborative initiatives on photography in the near future.

https://www.aiub.edu/aiub-photography-club-aiubpc--workshop-in-collaboration-with-bcpa

Faculty of Engineering organized workshop on “Research Methodology.”

On Wednesday, July 19, 2023, at Multipurpose Hall, D-Building, AIUB, the Capstone Committee of Faculty of Engineering, organized a workshop on "Research Methodology". The program started at 4 PM with 200 attendees. The main theme of the workshop was to highlight the importance of research and the optimum way to start researching any subject matter.

Speaker of workshop Dr. Tanbir Ibne Anowar (Associate Professor, Faculty of Engineering, AIUB) highlighted the significance of Research. He inspired the participants and ensured that a well-designed research methodology is fundamental for achieving meaningful and reliable results and contributes to the advancement of knowledge in a particular field of study. He talked about the key points after a brief discussion on "Research Design, Research Participants or Subjects, Data Collection Methods, Data Analysis, Limitations, and Publications."

Following the question answer session, the session was concluded by Prof. Dr. Md. Abdul Mannan (Associate Dean, Faculty of Engineering, AIUB) who expressed gratitude to the speaker and presented him with a certificate of appreciation.

https://www.aiub.edu/faculty-of-engineering-organized-workshop-on-research-methodology

THM Field Trip to Chuti Resort, Gazipur

On 16th March 2023, the Department of Tourism and Hospitality Management (THM), AIUB organized a field trip to 'Chuti Resort' Gazipur with a view to making practical implications on theoretical subjects taught in the classroom. This interesting subject, filled with lots of fun combined with functional attributes turned this day into a fruitful one for THM students.

The Chuti Resort, an exclusive eco-friendly boutique-style resort situated about 18 kilometers from Dhaka International Airport, lies in the beautiful rural environment of Gazipur. This 50-room unique resort is surrounded by a beautiful lake and reserved forest promoting the long-forgotten rural custom of Bangladesh.

The Operations Manager Mr. Nazmul took the team through their daily operational procedure from 'Greetings to Goodbye'. Students had a valuable collaboration with the operations team of Chuti Resort and identified various aspects of challenges of resort management. Students then visited the resort and analyzed the strategy of destination planning and development. Students also seized the opportunity to visit the local area, taste the local fresh food, shop from local farmers, and realized how the city of Gazipur is becoming a 'City of Resorts'.

This tour was planned and conducted by THM faculty member Mr. Mahmudul Hasan.

https://www.aiub.edu/thm-field-trip-to-chuti-resort-gazipur

Faculty Research and Publications on SDG 11

The Fourth Industrial Revolution and Beyond

DR. MD. SANIAT RAHMAN ZISHAN et el.

With an ageing population, the demand of transportation is increasing. As a result, the road safety has become a critical issue. The road condition may differ from one place to another. Early detection of road condition can prevent number of accidents and casualties. In this paper, a system is proposed to reduce difficulties of the rider. The system can exert the unknown crippled point, potholes of any road by the acceleration of a vehicle whenever it passes away. Besides the position tracking and monitoring system, it will locate the respective location automatically and update current condition in Google Map. This location tracking information will help the upcoming rider to get the overview of the road beforehand.

https://link.springer.com/chapter/10.1007/978-981-19-8032-9_29

The Fourth Industrial Revolution and Beyond

ABIR AHMED et el.

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https://link.springer.com/chapter/10.1007/978-981-19-8032-9_29

Design and Implementation of Smart Drainage System for Bangladesh

DR. MD. SANIAT RAHMAN ZISHAN et el.

As most of the areas in Bangladesh have adopted an underground drainage system, it is very important that this system work in a proper manner to keep the country clean, safe, and healthy. Failure to maintain regular monitoring of the drainage system results in the contamination of rainwater with drainage water, which spreads infectious diseases. This paper presents the implementation and design of a microcontroller-based drainage system for monitoring and maintaining the continuous movement of rainwater inside an underground drainage system remotely from a workstation. Using the Internet of Things (IoT), various parameters like water level, block detection, rainfall rate, etc. are monitored and stored on the cloud for analysis. The system also provides a forecast using Fisher's Rules. This enables the person in charge to take the necessary actions regarding the issue and send warning signals to the public.

Smart Roads: Lighting the Way to Safety and Efficiency

MD. SAJID HOSSAIN et el.

The "Smart Roads: Lighting the Way to Safety and Efficiency" project introduces an innovative solution to improve the efficiency and sustainability of outdoor lighting systems. This research focuses on developing automated streetlights and introduces the indication concept for over-speeding drivers. The primary objectives of this design are to conserve energy, improve road traffic safety, and lower

casualties from road traffic collisions. By harnessing LDR, Ultrasonic sensor, and Arduino board, the proposed streetlights can automatically detect ambient lighting conditions and respond accordingly. These smart streetlights are programmed to activate during nighttime (or overcast days) and remain off during daylight hours, thereby optimizing energy usage. An Ultrasonic sensor is introduced that detects any vehicle from a distance and activates the Streetlights as the vehicle approaches. Even so, using the data from the Ultrasonic sensor, the speed of vehicles is measured, and drivers are warned to use additional

lights at the mid-bottom of the lamp post. The significance of this project lies in its potential to revolutionize urban lighting infrastructure. The technology's accessibility and affordability can lead to a widespread adaptation, contributing to broader societal benefits.

https://ieeexplore.ieee.org/document/10441196

Beyond the Gridlock: A Comparative Study of HTMS and ATMS in Achieving Sustainable Traffic Solutions for Dhaka City

MD. MORTUZA AHMMED et el.

Urban areas grapple with a formidable challenge to sustainability and quality of life due to traffic congestion. This study intricately examines the intricacies of traffic management in Dhaka City, investigating the potential of both Human Traffic Management System (HTMS) and Automated Traffic Management System (ATMS) in alleviating gridlock and fostering sustainable transportation solutions. The inquiry commences with a comprehensive analysis of the existing traffic scenario in Dhaka City, pinpointing critical pain points and challenges contributing to persistent congestion. Subsequently, the study introduces and scrutinizes two primary traffic management approaches: HTMS, characterized by human-operated systems, and ATMS, relying on automated technologies and artificial intelligence. Conducting an extensive comparative analysis, this research evaluates the effectiveness, advantages, and limitations of both HTMS and ATMS within the unique traffic landscape of Dhaka City. Parameters such as real-time adaptability, scalability, environmental impact, and cost-effectiveness are carefully examined to gauge the overall sustainability of these systems. Moreover, the study delves into the social and economic implications of implementing HTMS and ATMS, incorporating perspectives from commuters, local businesses, and city planners. The exploration extends to the potential for integrating these systems, proposing a hybrid model that

optimizes the strengths of both approaches. The research findings offer valuable insights for policymakers, urban planners, and traffic management authorities in Dhaka City, furnishing a roadmap for the adoption of sustainable traffic solutions. Armed with an understanding of the strengths and weaknesses of HTMS and ATMS, decision-makers can make informed choices prioritizing efficiency, environmental impact, and the overall well-being of the city's inhabitants. Ultimately, this study endeavors to shape the development of a tailored traffic management strategy that transcends gridlock, ensuring a sustainable and smoother traffic flow in Dhaka City.

https://ieomsociety.org/bangladesh2023/

IoT Based Air Quality and Noise Pollution Monitoring System

ABIR AHMED et el.

Air pollution is the presence of contaminants or poisonous substances that interfere with human health or welfare or create destructive natural impacts. With the fast improvement of communication innovations, remote sensing technology, and air pollution monitoring systems, it is possible to check the air concentration and take appropriate action. In this paper, a system is developed that can monitor different parameters, like O 3 , NO 2 , CO 2 , and temperature in real time. The control system converts all the data to human-readable values. With the development of a communication system, all data is stored in a cloud database. A decision-making calculation algorithm is developed using advanced technology like cloud computing. Further, a visual platform was created to allow the user to access the data remotely.

https://icrest.aiub.edu/

An IoT Based Smart Grid: Peer-to-peer Energy Trading for Electric Vehicles Using M2M Communication Technology

ABIR AHMED et el.

M2M refers to the use of sensors and intelligence to connect physical assets such as physical assets or consumer devices to the Internet and these things in turn will connect to the Internet through the Internet of Things (IoT) communications. Since the vision and model have existed, the number and types of connected things have grown, along with technologies for capturing, processing, and sharing data. This m2m technology was founded on mesh technology, and the communication protocol is MQTT (Message Queuing Telemetry Transport. It is a lightweight messaging protocol developed for constrained devices and networks with high latency, low capacity, or unstable networks. In this paper, it will be constructed with two solar-powered charging stations. There are twoseparate batteries for two charging stations. One is Main charging station and another is supportive charging station. If the voltage of one battery drops, another station will share the voltage from the battery it has. For whatever reason that fails, the battery will be charged from the national grid and supplied to the load. All the data, notification & information will be stored in a local server.

Design and Implementation of Smart Drainage System for Bangladesh

ABIR AHMED et el.

As most of the areas in Bangladesh have adopted an underground drainage system, it is very important that this system work in a proper manner to keep the country clean, safe, and healthy. Failure to maintain regular monitoring of the drainage system results in the contamination of rainwater with drainage water, which spreads infectious diseases. This paper presents the implementation and design of a microcontroller-based drainage system for monitoring and maintaining the continuous movement of rainwater inside an underground drainage system remotely from a workstation. Using the Internet of Things (IoT), various parameters like water level, block detection, rainfall rate, etc. are monitored and stored on the cloud for analysis. The system also provides a forecast using Fisher's Rules. This enables the person in charge to take the necessary actions regarding the issue and send warning signals to the public.

International Conference on 'Rivers of South Asia: Connecting Ecology, People, and Governance'

FERDOUSI BEGUM et el.

In contemporary environmental jurisprudence, there is a trend of granting legal personhood to rivers for environmental protection although it could not mitigate the environmental crisis. The High Court of Uttarakhand, India, declared the rivers Ganga, Yamuna, and glaciers to be legal persons in 2017 through the judgments Mohammed Salim v. State of Uttarkhand and Lalit Miglani v. State of Uttarkhand respectively. Following this trend, the High Court Division of the Supreme Court of Bangladesh awarded legal personhood to rivers in 2019 in Human Rights and Peace for Bangladesh v. the Govt. of Bangladesh and Others to prevent encroachment and pollution of the rivers. This paper demonstrates on what basis these rulings are given in these cases and to what extent such rulings help to protect the environment in the era of development. It analyses the emerging environmental jurisprudence of granting legal personhood to rivers in Bangladesh and India in improving environmental protection. The implementation method of these judgments is a way to assess whether the new legal initiative of granting legal personality to rivers improves the existing environmental legal frameworks in Bangladesh and India or not.

http://www.northsouth.edu/sipg/news-and-events/international-conference-on-rivers-of-south-asia.html

IoT Based Power Monitoring and Management System of A Distribution Substation

DR. MOHAMMAD TAWHIDUL ALAM et el.

Remote monitoring and control of a substation is a critical issue for the power or energy management department, which is typically done manually or with the help of a costly PLC and SCADA system.

With the emergence of the internet and the computational era, a smart monitoring and trustworthy controlling system over the complete sub-station is extremely desirable, which may be accomplished by implementing Internet of Things (IoT) technology. A substation contains numerous electrical components such as transformers, breakers, relays, etc. The traditional method requires a regular manual testing system with limited precision. Furthermore, substations in metropolitan settings are more difficult to physically inspect, requiring more time to complete related tasks. In this research work a monitoring system has been proposed that is low-cost, user-friendly, and works automatically to avoid labor involvement and system loss. The results of the system are displayed in many ways to ensure that the system parameters will be monitored by more than one person for safety and protection reasons. A novel feature of automatic load management system is incorporated in this project which is absent in the latest work in the literature. When load demand is increased beyond the allocated power of a particular area a priority-based load shedding is performed automatically. The project is simulated using Proteus. Besides, a small prototype has been built to monitor physical operation. The uniqueness of this system is the display of results on desktop and mobile phones simultaneously.

Design and Implementation of Smart Cities for Sustainable Development

DR. MUHIBUL HAQUE BHUYAN et el.

My talk throws some light upon the following topics-Smart City: Definition, Characteristics, and Introduction Smart Bangladesh Initiatives Demand or Market Value 17 UN SDGs and their relation to Smart City Initiatives Design and Implementation Method Recent Research Works on Smart Cities Recommendations and Conclusions.

Meta Bin – An Arduino-Based Smart Device for Collecting Trash

DR. MUHIBUL HAQUE BHUYAN et el.

In metropolitan areas of Bangladesh, 55% of solid garbage is often not collected with collection efficiency ranging from 37% to 77%. Due to this, most of the roads are dirty which is difficult for the cleaners to clean. To solve these problems, we proposed a solution using a smart device named as Meta Bin. This smart device is designed in such a way that it can follow people anywhere. In addition, if any incoming trash is detected, the lid of the bin is opened and thereby storing garbage there. To determine the amount of waste in the bin, there are three layers defined for three different amounts of garbage- low, medium, and high trash. It can send the signal to the control room if the garbage level of the bin is high. It can help to reduce the transportation cost of the municipal authority. The purpose of this research work is to build a clean environment at a low cost and make the garbage collecting processes easier. Simulation of the system was performed in Proteus and was implemented real-time implementation using an Arduino microcontroller along with several sensors. Testing of the system was satisfactory.

Design, Simulation, and Implementation of a Surveillance Robot System

DR. MUHIBUL HAQUE BHUYAN et el.

The main goal of this paper is to design a surveillance robot system to use for various purposes. This robot can be operated either manually or automatically. It explores a specified area and sends back different data from there, such as images, audio, video, or text messages, etc. This work utilizes the Internet of Things (IoT) to allow remote control of the robot from a smartphone, laptop, or desktop PC. Besides, this system can perform real-time video streaming using the wireless camera installed in the system both day and night. The Arduino Uno microcontroller processes both manual and automatic operation of the robot, regulates its actions, and receives input signals from various sensors. Metal detectors are used in the robot to identify any metal objects, such as bombs, explosives, etc. The live-streaming video feed facilities ensure that the system can be used to deactivate any bomb or explosives by watching the videos remotely. Besides, this facilitates surveillance operations. Apart from an Arduino Uno microcontroller, we also used DC motors, a 4-wheel chassis, a battery, an ESP8266 Wi-Fi module, and a variety of sensors for detection purposes. To facilitate the application of the Internet of Things for user-end communication, software called CAYENNE has been utilized. The performance test shows that the system is working very well.

Design, Simulation, and Implementation of a Home Automation System using Arduino Microcontroller

DR. MUHIBUL HAQUE BHUYAN et el.

As technology is advancing, modern houses are gradually shifting from conventional to centralized control systems. Conventional switches located in different parts of a house make it difficult for the user to operate, especially for the elderly or physically handicapped people. The main objective of this research is to develop a home automation system using an Arduino and Bluetooth to control remotely using a smartphone. The Bluetooth module is interfaced with the Arduino at the receiver end while on the transmitter end, a Graphics User Interface (GUI) application on the cell phone sends ON/OFF commands to the receiver to which loads are connected. By touching the specified location on the GUI, the loads can be turned ON/OFF remotely. We designed the circuit using the Proteus simulator and wrote the code in Arduino IDE, and connected the Arduino board to the computer through its USB port. For the simulation of the whole system, we used Proteus software. Both simulation and implementation produced the same results.

Ammonia & CO2 Gas Detection of Poultry Farms and Compost Plants by Low-Cost Smart Sensing System

DR. SHUVRA MONDAL et el.

Poultry farming plays an essential role in the global food supply chain and is a major contributor to human protein needs. However, the use of intensive poultry production methods has been linked to the emission of a variety of pollutants into the atmosphere. These emissions can pose detrimental effects on air quality

and public health and contribute to greenhouse gas concentrations. Compost plants play an essential role in the management of organic waste, converting organic matter into soil nutrients. The process of composting is associated with the emission of various pollutants into the atmosphere. In light of these considerations, a cost-effective CO 2 and ammonia gas sensing device with IoT integration for poultry and compost plants has been proposed. The platform has been designed to be integrated and easy to monitor the gas level as well as temperature and humidity from cost-effective sensors and other components, making it suitable for developing countries such as Bangladesh. The proposed devices have the capability to automatically regulate the CO 2 and Ammonia gas level when it reaches an alarming level. Moreover, the proposed system can be fully monitored and operated remotely in real-time from any location via a mobile application or the Internet. Furthermore, this modular and easily assessable device can be modified to facilitate in other industries such as dairy and processed food industries of developing countries.

Enhancing Urban Mobility: An Adaptive Traffic Signal System for High-Density Cities

NUZHAT TABASSUM et el.

Urban regions in Bangladesh are increasingly plagued by traffic congestion, which increases travel times, lowers productivity, and increases emissions. Thus, the objective of this research is to develop an efficient adaptive traffic control system to reduce traffic congestion in high-density cities. To attain this objective, first, user requirements focusing to develop a digital solution were elicited through surveys. Then, a conceptual framework was proposed to address the revealed requirements followed by developing the adaptive system. The proposed system offers vehicle detection through YOLOv7 algorithm, vehicle prioritization on the road, dynamic traffic signal duration, overriding as well as assuring instant emergency access. Finally, the system was evaluated by measuring the performance of YOLOv7 model for predicting vehicles and by assessing the execution of system functionalities. The evaluation results revealed a commendable level of prediction accuracy, ranging from 93\% to 100\%. Furthermore, the system functionalities were successfully executed with an average success rate of 92\% and an average execution time of 2.0 ± 0.31 seconds.

Design, Simulation and Implementation of a Self-Serviced Vending Machine for Drinks Using an Arduino Microcontroller

DR. MUHIBUL HAQUE BHUYAN et el.

As technology is advancing, people are accustomed to an automated system. Manual systems are very difficult for the user to operate. The foremost objective of this study is to design, simulate, and implement a drinking vending machine that can be used by customers without the help of the seller. This machine can also collect and manage the cash as per the customer’s orders so that the owner doesn’t have to worry about the cash manager. We designed our system in the Proteus environment and wrote the program for the Arduino in the Integrated Development Environment (IDE), and linked the Arduino to the computer through its USB 3.0 port. Both simulation and implementation results confirm the successful design.

IoT-Based Smart Poultry and Fish Farming System Using Arduino

DR. MUHIBUL HAQUE BHUYAN et el.

This research work aims to reform the conventional farming system, making it smart and automated with the use of Internet of Things (IoT) technology. The work targeted to automate the poultry and fish farming system. As such, the system uses an Arduino Uno microcontroller as a digital controller integrated with an IoT to aid farmers in remote monitoring and controlling the farming system. The farming system consists of a poultry farm at the top and a fishing farm at the bottom of a vertical farming system. The system mainly monitors the critical parameters of the farming environment, such as pH value, temperature, humidity, dissolved oxygen levels, etc. through some sensors. Then it takes appropriate actions based on the sensed parameter values through some actuators, such as servomotor. DC motor, pump, fan, etc. to regulate the farming environment's variables to the values within the acceptable ranges automatically. This would reduce the time and effort to be spent on farming significantly. Testing and evaluation of the system through Proteus software simulation and hardware implementation show that the target has been achieved.

https://icbbdb.com/workshop-on-icbbdb-wicbbdb-2023/

Microcontroller-Based Embedded System Design and Implementation towards Sustainable Development Goals

DR. MUHIBUL HAQUE BHUYAN et el.

This was an invited talk. The conference was organized online on the Zoom platform by the Oguz Han Engineering and Technology University of Turkmenistan in association with the Academy of Sciences of Turkmenistan

Here is the abstract that was submitted initially:

The United Nations approved the 17 Agenda of the Sustainable Development Goals (SDG) to implement a sustainable world by 2030. It was accepted that poverty and other problems in this world must be resolved jointly in the areas of poverty, health, energy, education, gender inequality, economic growth, environment and climate changes, social issues, collection and preservation of natural resources above and below this earth, etc. The 17 SDGs encompass 169 sub-targets to be attained by 2030. For this purpose, we need a coordinated and concerted effort by all signatory countries. Engineering design research, innovations, development, and commercialization can support us in the venture. In this talk, the emphasis would be given to the recent research and innovative product development of the microcontroller-based embedded system design to realize the 17 SDGs within the stipulated time frame, and as such, we will be able to attain both societal and economic impacts for viable progress. Here, I shall also concentrate on a few goals to demonstrate how the microcontroller-based embedded system design and development can help us in this regard. These areas are good health and well-being, quality education, clean water and sanitation, affordable and clean energy, sustainable cities and communities, life below water, and life on land.

Finally, we are confident that the microcontroller-based embedded system design is very chip and so, electronic engineers find it easy to resolve complex engineering problems to achieve specific SDGs, and hence to realize a sustainable world for humanity.

http://ijmrt.in/volume-5-issue-4-2023-issues%20.html?catid=66

Emission and Valve Point Loading Cost Using Superiority of Feasible Solutions-Moth Flame Optimization

MD. SHAORAN SAYEM et el.

The optimal power flow (OPF) the most crucial instrument for power facility design and performance is analysis, load scheduling, and cost-effective dispatch. To determine the evidence of a steady state for a power system network, an optimal power flow analysis is required. This study introduces a novel optimization method called Superiority of Feasible Solutions-Moth Flame Optimization (SH-MFO) to answer the optimal power flow problem. As part of the MATLAB development, SH-MFO is implemented on the IEEE-30 bus standard experiment structure network. When compared to the reliable outcomes produced by other algorithms, the current study employing SH-MFO estimates a Generation and Emission Costs 48.6827/h for minimizing the different fuels, which ultimately proves to be the best value. Analyze the poorest options suggested by the comparison algorithm, it saves money by 0.9873 % per hour. Based on simulation results, the SH-MFO method provides an improved and effective optimization algorithm for optimal power flow problems.

https://ieeexplore.ieee.org/xpl/conhome/10101485/proceeding

Isolation Forest-Based Anomaly Detection and Fault Localization for Solar PV System

ABU SHUFIAN et el.

The decrease in fossil fuel reserves has prompted a global move toward distributed energy resources. For this reason, solar PV power generation has recently gained much attention as a feasible renewable energy source. However, large-scale generation is challenging if there are anomalies in individual solar PV panels. This will reduce the efficiency of the PV system and create a potential fire hazard. In this perspective, the anomaly detection technique discloses system anomalies accurately and effectively. Identified anomalies will localize the event for an improved generation. This paper addresses the performance analysis of using the isolation forest technique to identify anomalies in the PV system and the rule-based fault localization technique to identify defective panel events. In the developed model, the isolation forest technique found around 453 anomalies in 45,740 observations, and approximately six panels indicated a fault in the system. The accuracy score is found to be approximately 0.9886. The proposed fault detection method will help detect the faults in solar power systems.

https://icrest.aiub.edu/

Optimized Energy Management of Grid Connected Solar/Battery-dependent Smart Microgrid

ABU SHUFIAN et el.

To satisfy the escalating energy demand with minimal environmental damage, the world is taking an expeditious shift toward the augmentation of renewable energy sources with the prevailing power sources by using a microgrid, where solar/battery-based grid-connected microgrid systems are gaining immense popularity. However, the intermittent nature of the sun is the most significant impediment to producing a steady flow of energy with solar power, so to resolve

this issue, an optimized microgrid energy management system (EMS) has been proposed in this paper, which provides the requisite functionality to ensure that the consumption, production, and distribution systems supply energy level at minimum operational costs. With the aid of demand-side management, a linear programming optimization technique has been developed for cost-effective microgrid operation, monitoring, and administration. The obtained result from this

proposed model clearly bespeaks the usefulness of the optimized EMS of the microgrid model, which can effectively generate electricity and deliver it to customers at low prices.

https://conf.manit.ac.in/resem2023/index.php

Investigating Clean Energy Generation from Unoccupied Roof-top Space in University Premises

ABU SHUFIAN et el.

Distributed energy sources are becoming popular for producing clean energy, depleting fossil fuels, and meeting growing electricity demand. Solar PV is one of the most commonly used renewable energy sources due to its availability and cost-effective operation. Recently, the roof-top PV system installation on academic premises has been significantly emerging. The unoccupied roof space can be effectively used to generate electricity to substantially meet the university's load demand. This paper investigates the feasibility of a roof-top PV system placed on the EME (Electrical and Mechanical Engineering) academic Building in Chittagong University of Engineering and Technology (CUET). A small test system was developed considering the effective roof-top area and actual load demand. The simulation results demonstrate that the proposed system successfully meets the required load demand of the building. An excess energy supply during peak sun hours can also be shared with the nearby premises.

https://conf.manit.ac.in/resem2023/index.php

Prospects and Economic Feasibility Analysis of Solar PV/Hydrogen Fuel-based Power System for Green City

ABU SHUFIAN et el.

Meeting the energy demands of self-sustaining off-grid systems, especially in regions with extreme solar intermittency and energy consumption patterns like northern climates, requires effective short-term and seasonal energy storage solutions. This research investigates the feasibility and economic viability of a solar PV/hydrogen fuel-based power system for a green city. Employing the Hybrid Optimization of Multiple Energy Resources (HOMER) software, an extensive analysis is conducted to optimize and simulate the proposed system. And a comprehensive assessment is performed to evaluate the technical and economic feasibility of implementing this system in a green city context. Key factors such as potential energy generation capacity, system efficiency, and economic viability are thoroughly analyzed. The findings reveal that the proposed system offers a reliable and sustainable energy source for a green city. By significantly reducing greenhouse gas emissions and providing a cost-effective solution to meet the city's energy requirements, this system showcases its potential in addressing environmental concerns.

https://confncim.com/

Grid-tied Smart Microgrid with Heuristic Optimized Energy Management System (EMS)

ABU SHUFIAN et el.

There is a global shift towards integrating renewable energy sources into existing power systems to address the increasing energy demand while minimizing environmental impact. One popular approach is the utilization of solar/battery-based grid-connected microgrid systems, which have gained significant popularity. However, the intermittent nature of solar power poses a challenge in ensuring a steady energy supply. To overcome this challenge, this research proposes an optimized microgrid EMS that efficiently manages energy consumption, generation, and distribution, aiming to minimize operational costs. A cost-effective solution for microgrid operation, monitoring, and administration has been developed by incorporating demand side management (DSM) techniques and employing a heuristic optimization approach. The results demonstrate a remarkable 33.6% reduction in operational costs compared to systems without an EMS. These findings highlight the effectiveness of the proposed optimized EMS in generating and delivering electricity to consumers at affordable prices. This research contributes to the advancement of microgrid systems and provides valuable insights for policymakers, industry stakeholders, and researchers, supporting the adoption of renewable energy and enhancing microgrid performance.

https://confncim.com/

Enhanced Optimum Design and Performance Evaluation for Grid-Connected Solar PV Rooftop Systems: A Case Study for Bangladesh

ABU SHUFIAN et el.

Load-shedding has been rising because of a vast gas shortage that has led to Bangladesh's significant fall in power generation. Renewable energy sources could help Bangladesh's electricity production overcome these problems. The roof-mounted solar PV system is a desirable alternative energy source. Location, design, appropriate installation, and solar module type all affect the performance and efficiency of a PV system. The PV simulation tool computes how much electricity will be produced by the PV array setup. The energy efficiency of rooftop PV systems is significantly impacted by the design and orientation of roofs. By increasing the energy production of rooftop PV systems through improved roof design, this study seeks to close a knowledge gap. In this study, we used SketchUp and PVsyst to design and simulate a grid-tied rooftop solar photovoltaic system for Bangladeshi educational-type consumer loads. This project also attempts to lower grid outages close to the building, energy costs (COE), grid dependence, and CO2 emissions. The suggested system has been accurately modeled, considering factors such as choosing the most suitable PV panel rating, inverter, tilt angle, sun azimuth, shading calculation, loss calculation, performance, and technical assessment. The electric grid receives extra energy. The suggested system will generate electricity efficiently, minimizing reliance on the grid, as shown by the real-time simulation.

https://csa.ru.ac.bd/icrpset/2022/

GSM-based Automatic Voltage Protection System for Residential Small Appliances

ABU SHUFIAN et el.

A voltage protection system is one of the essential things in most of residential and home appliances. It is a low-cost, easy-to-use system that safeguards electrical and electronic devices and low-power home appliances. The main goal of this research is to create a system that can detect undervoltage and overvoltage conditions and regulate the associated output of different loads. The proposed protection system is developed and analyzed in the Proteus flatform. A voltage divider circuit and a voltage regulator are attached to the Arduino Pro Mini in the protection model, which determines whether the voltage level is accurate. When the GSM module is turned on, the user receives a message that says “System Initializing”. When the voltage reaches a threshold level, it notifies the user that “System is ON”. Otherwise, it notifies the user that “System is OFF”. Several case studies reveal that the system protects small residential and home appliances from undervoltage and overvoltage.

https://www.bracu.ac.bd/academics/departments/electrical-and-electronic-engineering/icepe-2022

Enhancing DDoS Attack Detection Using Machine Learning: A Framework with Feature Selection and Comparative Analysis of Algorithms

RIFAT AL MAMUN RUDRO et el.

Distributed Denial of Service (DDoS) attacks are an ever-present threat to network security and can make online services hard for users to access. Conventional detection methods often struggle to effectively counter new and sophisticated DDoS attacks. This research article aims to assess the effectiveness of several machine learning methods in detecting distributed denial-of-service (DDoS) attacks. The evaluation is conducted using the DDOS attack SDN dataset, which is sourced from Google's research dataset. Various algorithms, including Random Forest, Decision Tree, Naive Bayes, and Support Vector Machine (SVM), are used for the purpose of analyzing network traffic data and detecting abnormal patterns that may indicate DDoS attacks. Results indicate that the Random Forest algorithm achieves the highest accuracy rate of 99.4% in detecting DDoS attacks. Additionally, the Decision Tree and SVM algorithms perform admirably, achieving accuracy rates of 98.8% and 98.4%, respectively. This research underscores the potential of machine learning algorithms in detecting and mitigating DDoS attacks. It emphasizes the necessity of employing advanced techniques for robust cyber threat defense and offers valuable insights into the performance of different machine learning algorithms in the context of DDoS attack detection.

10.61841/turcomat.v14i03.14086

Application of Machine Learning Predicting Injuries in Traffic Accidents through the Application of Random Forest

ABU HENA MD. SHATIL et el.

Abstract:

Background: The objective of this work is to analyze and predict the harmfulness in traffic accidents.

Method: Several Random Forest statistical models are created, in which the predictable variable (response/ output variable) is the harmfulness of the accident, while the input variables are the various characteristics of the accident. In addition, these generated models will allow estimating the influence or importance of each of the factors studied (input variables) concerning the harmfulness of road accidents so that it is possible to know in which aspects it is more profitable to work with the objective of reducing mortality from traffic accidents [1]. Results: In this regard, the predictive algorithm has an out-of-bag error of 26.55% and an overall accuracy of 74.1%. Meanwhile, the local accuracy of the mildly wounded class is 66.1% compared to 81.4% of the dead and severely wounded class, which, as mentioned, has higher prediction reliability.

Conclusion: Finally, it is worth noting the enormous usefulness of the Random Forest machine learning technique, which provides very useful information for possible research or studies that may be carried out. In the specific case of this work, through the use of the R programming language,

which in turn presents a wide range of freely accessible utilities and functions with which it may be interesting working, it has generated results of great value for this area of activity, important to society as road safety.

The Role of Scientific Research Publications on Sustainable Sectoral value Addition and Economic Growth in Bangladesh

DR. SHIBLI AHMED KHAN et el.

This paper explores the role of scientific publications along with sectoral value addition on economic growth in Bangladesh over the period 2000-2020. The Johansen co-integration test is applied to investigate the long-run relationship among the variables. The Granger causality test examines the short-run relationship among the variables. The FMOLS model is also applied to confirm the robustness check in this study. The empirical findings show that a strong long-run co-integration relationship exists among economic growth, scientific publications, and other explanatory variables in this study. The Granger causality test reveals bidirectional causality running from agriculture value added to services value added. Whereas, unidirectional causality exists among the variables of scientific publications to GDP per capita, scientific publications to manufacturing value-added, services value added to scientific publications, GDP per capita to industry value added, services value added to GDP per capita, manufacturing value added to industry value added, services value added to manufacturing value added in the short run. The impulse response function implies that shock applied to scientific publications affects economic growth negatively. So, the policymakers of Bangladesh should emphasize scientific publications by increasing investment in RnD to reach the status of a middle-income country through sustainable sectoral development.

https://worldscientific.com/doi/10.1142/S2810943023500026#:~:text=This%20paper%20explores%20the%20role%20of%20scientific%20publications,causality%20test%20examines%20short-run%20relationship%20among%20the%20variables.

Prediction of Flood in Bangladesh Using Different Classifier Model

MD. SAJID HOSSAIN et el.

Bangladesh is highly affected by climate change scenarios notably floods due to its location on the world map in the South Asian region. Besides due to monsoon rains and high upstream rainfall in several areas eventually turn into floods. Thus, early flood forecasting might save human lives as well as agriculture crops. In this paper, we have applied different machine learning classifier models (Decision tree, Naive bayes, k-NN and Random forest) with a view to predicting the occurrence of flood. RapidMiner tool has been used extensively to perform data preparation, decision tree model generation, cross-validation, model selection and optimization of the model parameters. It is seen that the decision tree model has performed well by achieving an accuracy of 94.23% which is further optimized to reach 94.68%. Feature Selection using ‘correlation matrix’ is also a good aspect of this work by which we have achieved a good accuracy.

https://ajse.aiub.edu/index.php/ajse/article/view/365/151

IoT-Based Smart Battery Management and Monitoring System for Electric Vehicles

DR. EFFAT JAHAN et el.

The growing popularity of electric vehicles on a worldwide scale leads to further research to monitor their performance. The use of Internet of Things (IoT) technology will make it easier to integrate the automated real-time monitoring system with the current electric vehicle technology. The great majority of electric vehicles use rechargeable lithium-ion batteries. Use of lithium-ion batteries creates an overcharging situation in the battery, which significantly decreases battery life. It also increases the possibility of disastrous safety risks due to fire. This paper develops an IoT-based battery management system to minimize hazardous situations. The battery monitoring system (BMS) notifies the user about the condition of the battery in real time.

Computer Vision-Based IoT Architecture for Post COVID-19 Preventive Measures

DR. KAMRUDDIN MD. NUR et el.

The COVID-19 pandemic has wreaked havoc on people all across the world. Even though the number of verified COVID-19 cases is steadily decreasing, the danger persists. Only societal awareness and preventative measures can assist to minimize the number of impacted patients in the work environment. People often forget to wear masks before entering the work premises or are not careful enough to wear masks correctly. Keeping this in mind, this paper proposes an IoT-based architecture for taking all essential steps to combat the COVID-19 pandemic. The proposed low-cost architecture is divided into three components: one to detect face masks by using deep learning technologies, another to monitor contactless body temperature and the other to dispense disinfectants to the visitors. At first, we review all the existing state-of-the-art technologies, then we design and develop a working prototype. Here, we present our results with the accuracy of 97.43% using a deep Convolutional Neural Network (CNN) and 99.88% accuracy using MobileNetV2 deep learning architecture for automatic face mask detection.

http://www.jait.us/show-224-1284-1.html

Utilization of Machine Learning Strategies in the Investigation of Suspected Credit Card Fraud

MD. FARUK ABDULLAH AL SOHAN et el.

Credit card fraud transactions have been one of the most difficult issues for banks and other financial institutions in recent years. In such events, billions of dollars are lost by financial institutions and the banking system. Concurrently, user information is not safe for that purpose. To address these issues, this paper proposes an efficient solution to automate the task using machine learning techniques

such as SMOTE and ADASYN. This paper also intends to run machine learning supervised models. We discovered class imbalancing issues after examining the experiment outcomes on European cardholder datasets. Oversampling and under sampling strategies are utilized to solve fraud situations to avoid them. Predictive models such as the LR, K-nearest neighbors, decision tree, random forest XGBoost, and support vector machines are utilized to achieve the model accuracy required to find the most fit-able models for credit card fraud. The performance of SMOTE machine learning approaches increased with a 0.96 model accuracy in random forest and XGBoost

10.35444/IJANA.2023.15205

Smart Trash Collection System – An IoT and Microcontroller-Based Scheme

DR. MUHIBUL HAQUE BHUYAN et el.

Aims: IoT-based trash collection system is a system that can automatically detect obstacles, which can be simplified as trash, and opens the Meta Bin lid to receive the trash. The main goal of the system is to make an environment where to find a digital and automatic way to the trash collection system.

Study Design: The existing research aims to design, simulate, and implement a new system that can play a vital role in terms of making the environment clean, in a large sense the world clean. Along with that a system that can carry not only a trash bin but also any portable devices as it can be operated automatically.

Place and Duration of Study: Department of Computer Science and Engineering and Department of Electrical and Electronic Engineering, American International University-Bangladesh (AIUB), Dhaka, Bangladesh between October 2022 and February 2023.

Methodology: In this work, we have designed a new model using Arduino, an IoT device, a servo motor, an ESP8266 Wi-Fi microchip, several DC motors, several IR Sensors, LEDs, etc. to build a system like Meta-Bin. Arduino IDE is used for program development.

Results: This is an automated trash bin, which has a different level of trash collection capacity with proper identifications and LED light indications. Also, a continuous notification system is enabled here. After testing the implemented system, the system gives an accurate result in every possible way and has an accuracy rate of more than 95%.

Conclusion: After the successful implementation of this research, we hope that there will be an autonomous, well-decorated, digital, and user-friendly system available for the citizens of Bangladesh. This will be immensely helpful for all kinds of people and to ensure a clean environment, this research might play a vital role soon.

Keywords: Smart bin Arduino embedded system trash collector automated system

https://journaljerr.com/index.php/JERR/article/view/849

Rohingya Refugee: A Challenge of Humanitarian Crisis and Ways Forward

ROSTOMA BEGUM CHAUDHURY et el.

Bangladesh is an over populated country of South Asia, having a number 165,158,616 population. It has been a long time since Bangladesh is receiving Muslim Rohingyas from Myanmar considering the humanitarian perspective. Thus, it makes Bangladesh as a largest host of Rohingya refugees. It is a matter of great concern for both the countries to maintain a smooth bilateral relation. In 2017, the world has seen a mass exodus of Rohingya people among them most seek refuge in the shore of Cox's Bazar. These large number of people faced serious atrocities and oppression which forced them to migrate to another nation. These people are facing so many humanitarian issues since 1982 when their citizenship was snatched by the Government of Myanmar. From then, they were deprived of their basic needs and other necessary things. This paper attempts to give a never on the background of the Rohingya people, and then the focus onto the present scenario of Rohingya refugees in Bangladesh and their probable future, which is considered as our main focus. Apart from these, identifying the challenges of Rohingya refugees, a proper solution has been mentioned through recommendations.

Machine learning enabled IoT system for soil nutrients monitoring and crop recommendation

MD. REAZUL ISLAM et el.

Agriculture plays a vital role in feeding the growing global population. But optimizing crop production and resource management remains a significant challenge for farmers. This research paper proposes an innovative ML-enabled IoT device to monitor soil nutrients and provide accurate crop recommendations. The device utilizes the FC-28 sensor, DHT11 sensor, and JXBS-3001 sensor to collect real-time data on soil composition, moisture, humidity, temperature, and for nutrient levels. The collected data is transmitted to a server using the MQTT protocol. Machine learning algorithms are employed to analyze the collected data and generate customized recommendations, including a possible high-yielding crop list, fertilizer names, and its amount based on crop requirements and soil nutrients. Furthermore, the applied fertilizers and treatments to the field during production are stored in the database. As a result, it has become possible to determine the quality of the produce at the consumer level through the mobile app. The system's effectiveness is evaluated through field experiments, comparing its performance with traditional methods. The results demonstrate the device's ability to enhance crop productivity and optimize resource utilization, promoting sustainable agricultural practices and food security. The research contributes to IoT-enabled agriculture, demonstrating the potential of ML techniques in improving soil nutrient management, facilitating informed decision-making about crop fertilizers, and assessing the quality of produced crops at the consumer level.

https://www.sciencedirect.com/science/article/pii/S2666154323003873

Utilization of Machine Learning Strategies in the Investigation of Suspected Credit Card Fraud

RIFAT AL MAMUN RUDRO et el.

Credit card fraud transactions have been one of the most difficult issues for banks and other financial institutions in recent years. In such events, billions of dollars are lost by financial institutions and the banking system. Concurrently, user information is not safe for that purpose. To address these issues, this paper proposes an efficient solution to automate the task using machine learning techniques such as SMOTE and ADASYN. This paper also intends to run machine learning supervised models. We discovered class imbalancing issues after examining the experiment outcomes on European cardholder datasets. Oversampling and under sampling strategies are utilized to solve fraud situations to avoid them. Predictive models such as the LR, K-nearest neighbors, decision tree, random forest XGBoost, and support vector machines are utilized to achieve the model accuracy required to find the most fit-able models for credit card fraud. The performance of SMOTE machine learning approaches increased with a 0.96 model accuracy in random forest and XGBoost.

Blockchain based Agriculture Using the Application of UAV and Deep Learning Technique: Alexnet CNN

KAZI SADIA et el.

Due to the warm and humid environment of Bangladesh, it is highly exposed to occurring perpetuation of various viruses which cause diseases in crops. A huge number of crops are wasted because of these occurring diseases and it directly hurts the production rate and forces import of crops in bulkier amount. Unmanned aerial vehicle usage is one of the smart agriculture technologies being researched for agricultural applications (UAVs) in these days. UAV technology allows farmers to quickly gather information on field conditions by providing overhead images of their agricultural fields or even allowing them to zoom in on a particular area. Using UAV technology, farmers may identify specific areas that need immediate attention and perform the necessary agricultural improvements. Drones collect data that farmers can use to detect crop disease by applying deep learning algorithms to make long-term decisions about planting, land mapping, damage control, and other things. This research uses blockchain technology to establish connection between suppliers and customers by enabling information to be tracked throughout the supply chain and enhances food supply chain safety. It offers a secure method of broadcasting data, focusing on enhancement of supply chain management and prediction of crops which makes it possible to implement and deploy data-driven technologies for smart farming. The research uses UAVs as a means of collecting crop images, implements a prediction model using AlexNet CNN and analyses how it performs with a real Bangladeshi crop disease dataset to help farmers from excessive crop damage. Furthermore, the overall process is carried out using the Blockchain technology to enhance the existing supply chain management process.

https://mjsat.com.my/index.php/mjsat/article/view/147

Assessing the Connectivity of Community Parks and Fields to Understand the Propensity of Use by the Neighborhood: A Case at Uttara Residential Area, Dhaka

SAIFUL HASAN TARIQ et el.

Uttara, a planned residential area in the northern part of Dhaka city center is the home to thousands of inhabitants in different sectors having fields, parks, and waterfront as public open spaces. This study tried to find out the connectivity of Community parks and fields with their surrounding neighborhood and assess its propensity of use by nearby community through space syntax analysis and questionnaire survey of park and field users of the Uttara residential area. The outcome helps to understand the relationship between accessibility and the propensity of use, within and beyond its surrounding neighborhood.

https://seu.edu.bd/seuja/downloads/vol_02_issue_01_Jun_2022/SEUJA-Vol02Issue01-2.pdf

Transforming Slum Dwellings into Better Livable Units: An Approach through Minimum Intervention

M. AREFEEN IBRAHIM et el.

Dhaka, the capital of Bangladesh and the 9th largest city in terms of population, is like an urban melting pot bubbling over with population and a city which is forever changing and never finished for it's over population. When Cities are out of control of population density problems, informal urban development is perceived as a consequence of uneven urban growth. The crisis of Dhaka city disables the conventional planning faculty and requests the formulation of alternatives that will integrate architecture of informality into the whole urban structure. This paper tried to figure out the poor living conditions at Duaripara slum which is in the north-western part of Mirpur Thana at Dhaka North City Corporation. Through research and hands-on inclusive solutions, the paper proposed options for their better living condition. Analyzing the present condition of light, ventilation and temperature inside the houses, this research shows how quality of life might be improved through nurturing the opening condition and insulation system of the existing house, which is very much affordable for the slum dwellers, but unfortunately, they are unaware of it. The innovative solutions and increase in skills of informal builders can uplift the permanent up-gradation to informal settlements. Literature study and field survey have helped to develop module design for the improved living conditions that can be retrofitted in existing built forms with minimum intervention. As we are now living in the cutting edge of technology, this small but inclusive initiative may open up big opportunities to upgrade the living conditions of the settlement of slums in Bangladesh and elsewhere with similar existing context.

Keywords: Slum up-gradation, Minimum intervention, Quality of Life, Affordable retrofitting

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https://ajse.aiub.edu/index.php/ajse/article/view/300

DSC Index: Measuring the Digital Supply Chain Practice among the Higher Education Institutions Community in Least Developed Countries

DR. S. A. M. MANZUR H. KHAN et el.

The 4th Industrial Revolution, more commonly referred to as Industry 4.0, has brought about a wave of multifaceted changes across the industrial spectrum around the world, and it has triggered the digitalisation of supply chains and their management regardless of the type of organisation. With increasing interconnectivity through various sectors, digital supply chain (DSC) practices and intentions have also become integral to higher education institutions. As streamlined, automated administrative processes and virtual classes conducted through online platforms become the norm, digitalisation has been catalysed in the education sector. However, several sociocultural, economic, and psychographic factors influence the adaptation of new technologies, especially in developing countries such as Bangladesh. This study uses the composite index approach to determine the Index derived from the correlation between the factors and their impact on the DSC practices and intentions. The study indicates that Trust (T) is the primary influencer, along with Performance Expectancy (PE), closely followed by Facilitating Value (FV), Facilitating Conditions (FC), and Digital Literacy (DL).

https://ajse.aiub.edu/index.php/ajse/article/view/886

IoT-Based Automated Solar Panel Cleaning and Monitoring Technique

DR. MUHIBUL HAQUE BHUYAN et el.

Aims: The objective of this research work is to design and develop an IoT-based automated solar panel cleaning and real-time monitoring system using a microcontroller to improve the output and efficiency of a solar module at a low cost.

Study Design: Most of the time, dust over solar panels creates a barrier that obstructs the sun's radiation and reduces their performance. As such, it is necessary to keep the solar panel clean to improve output power levels. We integrated the IoT technology along with a range of components, including a microcontroller, a NodeMCU, a servo motor, a DC motor-driven submersible pump, a Light Dependent Resistor (LDR), an LCD with driver IC, etc. to design the system. We developed the assembly language program for the microcontroller.

Place and Duration of Study: The work was conducted individually under the supervisor of a faculty member as a part of the final project work of the Master of Engineering degree in Electrical and Electronic Engineering at American International University Bangladesh (AIUB), Dhaka, Bangladesh. The student conducted his research work at AIUB for two consecutive semesters from September 2022 to May 2023.

Methodology: An LDR sensor detects the solar panel's dirtiness and triggers the cleaning process through the microcontroller. The system monitors this continuously and real-time vital data is accessible to have some performance metrics, empowering timely maintenance actions to be triggered by the system and hence ensuring the maximum power output. The automated cleaning mechanism, driven by servo motors and mini submersible DC motor pumps, effectively removes dust and dirt from solar panels. An application was used to get real-time data through the internet to the user's smartphone.

Results: The server data is accessed to observe the system performance. The cost analysis shows that this system offers a cost-effective and sustainable solution for maintaining clean solar panels and optimizing power output.

Conclusion: Such an automation system can contribute meaningfully to the progression of renewable power generation by significantly improving the efficiency and longevity of solar panels. Thus, we can have sustainable and efficient energy systems in the country by integrating IoT-based automation systems.

https://journaljerr.com/index.php/JERR/article/view/959

Design and Concept of Renewable Energy Driven Auto-Detectable Railway Level Crossing Systems in Bangladesh

SUSMITA GHOSH et el.

Bangladesh's railway system mostly uses typical manual railway crossing techniques or boom gates through its 2955.53 km rail route all over the country. Accidents frequently happen at railway crossings due to the lack of quickly operating gate systems, and to fewer safety measures at the railway crossing as

well. Currently, there are very few automatic railway crossing systems available (without obstacle detectors). Additionally, all of them are dependent on the national power grid, without a backup plan for any emergency cases. Bangladesh is still running a bit behind in generating enough power for its consumption; hence, it is not possible to have a continuous power supply at all times all over the countryside. We aim to design and develop a smart railway crossing system with an obstacle detector to prevent common types of accidents at railway crossing points. We use two infrared (IR) sensors to operate the railway crossing systems, which are controlled by an Arduino Uno. This newly designed level crossing system is run with the help of sustainable renewable energy, which is cost-effective and eco-friendly, and applied under the national green energy policy towards achieving sustainable development in Bangladesh as a part of the global sustainable goal to face climate change challenges. We have summarized the simulated the results of several renewable energy sources, including a hybrid system, and optimized the Levelized Cost of Energy (LCOE) and the payback periods.

https://www.mdpi.com/2673-7590/3/1/5

The Impact of User Participation on the Success of Enterprise Resource Planning (ERP) Adoption in Bangladesh

MD. MEHZABUL HOQUE NAHID et el.

The successful adoption of Enterprise Resource Planning (ERP) systems is crucial for organizations to enhance operational efficiency and gain a competitive edge. User participation has been recognized as a key factor in determining the success of ERP implementation. This study aims to investigate the impact of user participation on ERP adoption success in the context of Bangladesh. The specific objectives include assessing the relationship between user participation and work performance, understanding/proficiency, user-friendliness, and training/support. Additionally, the influence of organizational factors, such as organizational value, guidelines/procedures,and resource/support availability, on user participation is examined. The study also explores the impact of user participation on compatibility with existing organizational processes and alignment with strategic goals. The findings reveal that user participation significantly influences work performance, understanding/proficiency, user-friendliness, and training/support. Organizational factors and strategic alignment play important roles in facilitating user participation. The results emphasize the need tofoster user participation, provide adequate training and support, promote organizational values, and align strategic goals for successful ERP adoption in Bangladesh. These insights contribute to a better understanding of the factors that drive ERP implementation success and provide guidance for organizations in Bangladesh and similar contexts.

https://ojs.unikom.ac.id/index.php/injuratech/article/view/10292/3847

Design and Analysis of IoT-Based Battery Management and Monitoring System for Electric Vehicle

ABIR AHMED et el.

The growing popularity of electric vehicles on a worldwide scale leads to further research to monitor their performance. The use of Internet of Things (IoT) technology will make it easier to integrate the automated real-time monitoring system with the current electric vehicle technology. The great majority of electric vehicles use rechargeable lithium-ion batteries. Use of lithium-ion batteries creates an overcharging situation in the battery, which significantly decreases battery life. It also increases the possibility of disastrous safety risks due to fire. This paper develops an IoT-based battery management system to minimize hazardous situations. The battery monitoring system (BMS) notifies the user about the condition of the battery in real time.

https://ajse.aiub.edu/index.php/ajse/article/view/731

Detection of Traffic Rule Violations Using Machine Learning: An Analytical Review

RIFATH MAHMUD et el.

This research paper focuses on current and previous efforts to detect traffic rule violations. So far, some remarkable works have been discovered, and many approaches for detecting traffic rule violations have been introduced from the current situation. Hence, machine learning has been the main target to detect traffic rule violations. A summary of the frameworks and methods that have been used to solve this problem so far is also provided in this study. This study has been divided into two parts. In the first part, the recent works on traffic rule violations have been portrayed. Moreover, the algorithms and frameworks that have been used so far and major works on violation detection using machine learning can be found in this section. In the second part, this study summarizes a brief discussion based on the image quality, camera resolution, device performance, and accuracy level of the works, as well as the algorithms and frameworks that have been used to conduct the detection of traffic rule violation problems using machine learning.

https://mjsat.com.my/index.php/mjsat/article/view/146/93

IoT Based Single Identification Database Model For Under Development Countries

SYMA KAMAL CHAITY et el.

The Internet of Things is becoming one of the most primary topics of conversation in the World of information Technology. There is a huge revolution that comes with the internet of things. With its multi-disciplinary application growth, the Internet of Things has changed our lifestyle. In regular life, people need to provide their user information multiple times for creating any national or international

document. In this paper, a simple central server-based database model is proposed to reduce people's struggle of providing the same information multiple times and also reduces the chance of redundancy of data. According to this proposed model, users need to provide their information only once, and can use the same information in multiple sectors. Users need to provide their identification number which is provided by the central server and fingerprint only to access previously stored personal data. Users can easily create or update any national or international document using those data. The goal of this proposed model is to make a central database model for people to reduce the hassle of creating or updating national or international documents.

International and Bangladesh Perspective of Electronic Waste Management: Some Solution Proposals

DR. MD. KABIRUZZAMAN et el.

Electronic waste or e-waste is discarded electronic devices or equipment, which are no longer usable or broken. This includes but is not limited to, televisions, computers, smartphones, and other electronic devices. Metallic materials, silicon dioxide, polyester-based materials, phenol, formaldehyde, halogenated polymers, N-containing polymers, and other hazards have been identified in e-waste. 60.2% of e-waste is composed of various metals, such as Fe, Au, Pb, Hg, Cr, Cu, and Cd; 15.2% plastic components, 5% metal-plastic composites, and 12% tubes and screens [1]. Improper management of e-waste can cause environmental pollution and public health hazards. Hence, proper management of e-waste following ethical engineering practices is crucial. This article aims to explore e-waste management practices internationally and also from Bangladesh's perspective, as well as discuss how management practices can be done.

http://doe.portal.gov.bd/sites/default/files/files/doe.portal.gov.bd/page/9891d1c0_9d94_4d9d_8f9a_9ea5ffe0b46c/2023-06-21-09-29-b1116dab961193a0bcb97b8c16571493.pdf

Re-Thinking the Ashrayan Project-2

ALVI MD. RAGIB NIHAL KHAN et el.

The Ashrayan Project 2 is a government-led initiative in Bangladesh to provide housing for disadvantaged families. While the government's provision of two bedrooms, one kitchen, and one washroom for each family was a promising start, the families are struggling to live properly because the designs offered do not fit their lifestyle. The proposed design concept aims to improve the occupant's quality of life by creating co-living spaces that foster social interaction and do not impede their usual activities and livelihood opportunities. The proposed masterplan accommodates 59 housing units in five clusters with functional courtyards and open spaces that do not compromise program, spatial quality, liveability, or project cost. The construction process prioritizes locally sourced materials, with an emphasis on eco-friendliness and sustainability. Additionally, the project has designated spaces for residents to cultivate vegetables for their consumption and for the local community, rickshaw garages, and a community hub with a marketplace to promote a sustainable economy.

https://contextbd.com/re-thinking-the-ashrayan-project-2/

Enhancing Elderly Healthcare Access in Smart Cities: A Pathway to Inclusive Wellbeing

DR. AFROZA NAHAR et el.

Three Phase Fault Analysis using Thermal-Magnetic Circuit Breaker and Overcurrent Relay

ABU SHUFIAN et el.

Three Phase Fault Analysis using Thermal-Magnetic Circuit Breaker and Overcurrent Relay

http://icict4sd.bup.edu.bd/

Solar PV Panel Automatic Shading Analysis Using Boost Regulator and Inverter System

ABU SHUFIAN et el.

Solar PV Panel Automatic Shading Analysis Using Boost Regulator and Inverter System

http://icict4sd.bup.edu.bd/

Smart Power Systems for Smart Cities: Architectural Development and Economic Performance Assessment

ABU SHUFIAN et el.

Smart Power Systems for Smart Cities: Architectural Development and Economic Performance Assessment

https://r10htc2023.org/

An IoT-Enabled Microbial Fuel Cell for Wastewater Treatment and Enhancing Hydroponic Systems: An Eco-Friendly Renewable Energy Development

ABU SHUFIAN et el.

An IoT-Enabled Microbial Fuel Cell for Wastewater Treatment and Enhancing Hydroponic Systems: An Eco-Friendly Renewable Energy Development

https://r10htc2023.org/

Smart Monitoring and Control of Water Purification System Using UF Membrane Filtration

ABU SHUFIAN et el.

Smart Monitoring and Control of Water Purification System Using UF Membrane Filtration

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Design and Simulation of Standalone Solar Agri-PV System in Bangladesh: A case study

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