## American International University-Bangladesh (AIUB)

## **SDG Activity Report 2023**

## SDG 3: Good Health and Well-being

Ensure healthy lives and promote well-being for all at all ages



American International University-Bangladesh (AIUB) actively contributes to Sustainable Development Goal 3 by promoting health and well-being through educational and community initiatives. AIUB organizes health-focused seminars and workshops, such as "World Mental Health Day 2023" and "The Importance of Mental Health in Public Health", providing students and staff access to mental health support and raising awareness on key health issues.

Seminars like "Use of Machine Learning in Biomedical Signal Classification" and "Advancements in AI for Medical Imaging" demonstrate AIUB's commitment to integrating technology with healthcare. The university offers outreach programs targeting local communities, disadvantaged groups, etc. Initiatives like the "University-Based Lecture Program on Tobacco Control" and health-tech projects such as the Smart Inhaler for Lung Cancer Risk Detection highlight AIUB's role in advancing community health.

AIUB promotes sports facilities to encourage physical activity. AIUB has eatablished Medical Center and Mental Heath Services inside the campus. These initiatives align with SDG-3 by fostering a healthier campus environment and improving community well-being.

#AIUB #SDG3 #HealthAndWellBeing #MentalHealth #CommunityOutreach

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## University Activities towards SDG 3

### "University Based Lecture Program" on Tobacco Control

The Department of Public Health of the American International University-Bangladesh jointly organized a University-based lecture program on tobacco control with the Bangladesh Tobacco Control Research Network, and the Bangladesh Center for Communication Programs of Johns Hopkins University, BCCP-Hopkins Tobacco Control Program at AIUB Campus on Thursday, December 15.

The National Tobacco Control Cell additional secretary and coordinator Mr. Hossain Ali Khondoker, Ministry of Health and Family Welfare, attended the program as the chief guest while AIUB Faculty of Arts and Social Sciences dean Professor Dr. Tazul Islam attend the program as the chairperson.

BTCRN/BCCP senior advisor and Directorate General of Health Services director general Professor Shah Monir Hossain attended the program as the guest of honor. Besides, the registrar, deans, and professors of different departments attended the program.

Renowned tobacco control experts from the Hopkins Bloomberg Initiative partner and grantee organizations made brief presentations on different tobacco control issues including Introduction to Tobacco Control, Global and Local Experience, Health Effects of Quitting Smoking, Smoking and Tobacco Products Usage Control Act, 2005 and its amendment in 2013, Tobacco industry interferences targeting educational institutions, and Foundation for a Smoke-free World- Another trap of tobacco industry, the release added.

The chief guest of the program, Mr. Hossain Ali Khondoker, briefly mentioned the government's initiatives to fulfill the commitment of the prime minister, making Bangladesh tobacco-free by 2040.

In his speech, Professor Dr. Tazul Islam thanked the speakers for their valuable time and words.

https://www.aiub.edu/university-based-lecture-program-on-tobacco-control



### World Mental Health Day 2023 celebration at AIUB

On Tuesday, October 10, 2023, various student clubs at the American International University – Bangladesh (AIUB) came together to celebrate World Mental Health Day 2023 through a series of events. AIUB Arts Club and AIUB Social Welfare Club – Shomoy jointly organized an Art Exhibition on the theme of World Mental Health Day 2023 in the lobby of Building D. The exhibition was inaugurated by Mrs. Nadia Anwar, Founder Member and Vice Chairman of AIUB's Board of Trustees.

AIUB Oratory Club (AOC) hosted a parliamentary debate at the amphitheater, focusing on the theme "Family bonding is the only remedy of mental stress". The debate received positive feedback from the audience. As part of the World Mental Health Day celebration, AIUB Performing Arts Club (APAC) delivered a musical performance that was enjoyed by students, faculty members, and officials alike.

It's worth noting that AIUB offers on-campus mental health support services to students, faculty members, and officials through 'WeVolve,' a reputable mental health support provider in the country.

https://www.aiub.edu/world-mental-health-day-2023-celebration-at-aiub



### Seminar on Importance of Mental Health in Public Health

The Department of Public Health, American International University-Bangladesh (AIUB) jointly with wEvolve, NiHealth, and Down Syndrome Society of Bangladesh organized a Seminar on "Importance of Mental Health in Public Health" focusing on the mental health of university students at the AIUB Auditorium on Wednesday, 26 July 2023. The Founder Member and Vice Chairman of the Board of Trustees of AIUB and the Chairman of wEvolve, Ms. Nadia Anwar attended the program as chief guest. The Pro-Vice Chancellor Prof. Dr. Abdur Rahman, the Registrar Prof. Dr. Zahidul Islam Khan, the Dean of Faculty of Arts and Social Sciences, AIUB, Professor Dr. Tazul Islam, Associate Deans, faculties, and students of different departments attended the program.

Dr. Tanjir Rashid Soron, Psychiatrist and Managing Director, NiHealth, Ms. Rifat Sharmin, Clinical Psychologist, wEvolve, and Mr. Sarder A Razzak, Chairman, Down Syndrome Society of Bangladesh, presented on key topics in mental health related to university students, including "Mind and Mental Health," "Exam Phobia," and "Learning Disabilities."

Dr. Muhammad Wasiful Alam, head of the Department of Public Health, delivered the keynote address on the value of studying public health in order to work in the fields of mental health and other developing areas of public health connected to both physical and mental health. Additionally, he noted that a variety of health issues, including COVID-19, Dengue, Cancer, Diabetes, and others, are currently affecting people all over the world. To address these issues, experts from interdisciplinary fields, including biochemistry, pharmacy, and microbiology, as well as law, engineering, economics, social sciences, and information technology, are needed. Therefore, a master's degree in public health adds professional value to help individuals advance their careers and meet SDG objectives.

The chief guest of the program, Ms. Nadia Anwar, briefly remarked that today it is important to concentrate on mental health awareness and prevention in order to establish strong interpersonal relationships, perform well at work, and maintain physical fitness. She added that only a small number of businesses care about the mental health of their workers and connected parties, such as students, and that AIUB is one of the first university to strive to concentrate on the mental health of students, faculty, and staff. She continued by saying that the Public Health Department at AIUB is also focused on mental health, making it distinct from many other universities in terms of its study on this subject.

Finally, Professor Dr. Tazul Islam handed over crests as tokens of appreciation to the Honorable Chief Guest and other guests and concluded the program with his vote of thanks.

https://www.aiub.edu/seminar-on-importance-of-mental-health-in-public-health



## Faculty of Engineering Participated in the Day-Long Training at Safety Academy, Samsung C & T Corporation

On August 10, August 17, August 24, and August 31, 2023, 108 students and 7 teachers from the Department of EEE, CoE & IPE, Faculty of Engineering, AIUB attended day-long training session in 4 different batches at the Safety Academy, Samsung C & T Corporation. The training aimed to enhance participants' awareness and knowledge of workplace safety practices.

The training took place at the Safety Academy, located at Ashkona, Choto Bot Tala, Female Anser Camp. Commencing at 10:00 AM., the training session began with a concise presentation introducing the academy and outlining various safety training programs. Following this, the significance of health and safety was elucidated, emphasizing the immense benefits of safety training in maintaining workplace safety. During the training session, participants were taken to different experience rooms, namely Basic and Electrical Safety, Falls and Enclosures, and Fire Safety. Each experience room provided hands-on exposure to potential workplace hazards and comprehensive guidance on mitigation strategies. After lunch, practical demonstrations of CPR (cardiopulmonary resuscitation) techniques were conducted, emphasizing correct hand placement, compression depth, and the ratio of compressions to rescue breaths. Participants were given opportunities to practice CPR on mannequins to ensure they understood and could perform the technique effectively. The training concluded with the distribution of certificates to all participants at 4:00 PM. Prof. Dr. Muhibul Haque Bhuyan (Professor, Faculty of Engineering, AIUB), Md. Ashiguzzaman (Assistant Professor, Faculty of Engineering, AIUB), Abu Shufian (Lecturer, Faculty of Engineering, AIUB), Dr. Mohammad Tawhidul Alam (Associate Professor, Faculty of Engineering, AIUB), Dr. Tanbir Ibne Anowar (Associate Professor, Faculty of Engineering, AIUB), Dr. Shuvra Mondal (Assistant Professor, Faculty of Engineering, AIUB), Tamim Hossain (Lecturer, Faculty of Engineering, AIUB) attended safety training with different batches on August 2023.

AIUB would like to extend its sincere appreciation to Samsung C & T Corporation for offering this excellent training opportunity and for their gracious hospitality.

https://www.aiub.edu/faculty-of-engineering-participated-in-the-day-long-training--at-safetyacademy-samsung-c--t-corporation



### "Career Planning and Professional Development" seminar

On October 09, 2023, the Department of Operations and Supply Chain Management (OSCM), Faculty of Business Administration (FBA), AIUB and Office of Placement & Alumni, AIUB jointly organized a seminar entitled "Career Planning and Professional Development".

The prime purpose of the seminar was to develop an understanding for the future graduates of OSCM department on how to chart their career and prepare accordingly. As we know, due to the COVID-19 pandemic, the job market and nature of jobs have transformed significantly, and our future graduates must be aware of these changes and prepare themselves accordingly. Two of our very successful alumni of FBA, Ms. Nusrat Jahan Alam, Head of Development, HR, SAJIDA Foundation and Mr. Shubhashis Gupta Shuvro, Manager, Procurement Operation, Unilever Bangladesh were the speakers on this occasion. The program was coordinated by Dr. Md. Tamzidul Islam, Assistant Professor & Head of the Dept. of Operations and Supply Chain Management, FBA under the direct supervision of Dr. Farheen Hassan, Associate Dean, FBA, AIUB and Mr. R. Tareque Moudud FCMA, Director, OPA, AIUB.

At the beginning, Mr. R. Tareque Moudud FCMA (Director, OPA), on behalf of AIUB, expressed sincere gratitude to the guests for taking out time from their busy schedule to come and address some of the current students of their alma mater. He also shared his opinion regarding the importance of career preparation during their academic journey. The program started off with our alumna Ms. Nusrat Jahan Alam who shared her career journey, highlighting points to be noted by aspiring job seekers. She also gave the audience tips on how prepare persuasive CVs and prepare for an interview. She also discussed some of the commonly made mistakes during this process and how to deal with those issues. Later, Mr. Shubhashis Gupta Shuvro shared the prospects of Supply Chain as a career and different options available for the major students who are interested to pursue their career in this field. He also shared his experience working for Unilever, the largest consumer brand in the world and various critical components of supply chain in his organization. He also gave his valuable insights to successfully pursue career in the field of supply chain management. Lastly, Dr. Rezbin Nahar (Director, UG Program) delivered the vote of thanks and concluding remarks. The program was hosted by Ms. Shanaz Zarin (Assistant Professor, FBA). Others present on the occasion were Dr. Md. Tamzidul Islam, Dr. Mohammad Rashedul Hoque, Dr. Anisa Khatun, Md. Hasibul Islam, Mr. Obaidul Islam. The organizers of the program gratefully acknowledge the continued support extended by the AIUB Management.

https://www.aiub.edu/career-planning-and-professional-development-seminar





## Seminar on "Use of Machine Learning and Deep Learning in Biomedical Signal Classification and their Applications in Healthcare"

On June 21, 2023, the Engineering Students Association of Bangladesh (ESAB) AIUB Unit Face successfully organized a seminar titled "Use of Machine Learning and Deep Learning in Biomedical Signal Classification and Their Applications in Healthcare". The session began at 3:30 PM with more than 50 attendees at Annex 3, room 3208.

The program started with the opening remarks by Prof. Dr. A.B.M. Siddique Hossain (Dean, Faculty of Engineering, AIUB). He gave a brief introduction about machine learning and deep learning, how this specific domain is having an impact on the 4th industrial revolution, and finally discussed the different types of opportunities one can enlighten themselves by exploring this fields. Following that, the honorable speaker, Md. Kafiul Islam, PhD, SMIEEE (Associate Professor, Department of EEE, IUB), discussed significant advances in the application of machine learning and deep learning techniques in the field of biomedical signal classification and their potential impact on healthcare. Furthermore, in his talk, he discussed the Biomedical Instrumentation and Signal Processing Lab (BISPL) and some research areas surrounding BISPL. Moreover, he described the scope and positive impact of machine learning and deep learning over Electroencephalography (EEG) and Brain Computer Interface (BCI) for various kinds of projects regarding Convolutional Neural networks, Screening of Depression in Young Adults, Artefact and Epileptic Seizure Detection, and many others. Lastly, he talked about the challenges that he faced conducting his research while also motivating the participants by discussing the opportunities that they might get to explore and contribute not only to the field of machine learning and deep learning but also to the field of medical science. Next, an engaging Q & A session followed the presentation, allowing faculty members and participants to interact with the speakers and gain further clarification on the topics discussed. Finally, the seminar was successfully concluded by the Mentor of ESAB AIUB Unit Face Dr. Md. Saniat Rahman Zishan (Director, Faculty of Engineering, AIUB). He extended his gratitude to the honorable speaker and highly appreciated the fruitful participation of all the attendees. After that, Dr. Md. Hasan Imam (Associate Professor, Faculty of Engineering, AIUB) thanked and presented a gift hamper to the speaker. Later, Dr. Md. Saniat Rahman Zishan handed over the crest to the speaker as a symbol of honor for his valuable contribution to the session. The event was graced by the presence of Motivator of ESAB AIUB Unit Face, Mr. Mehedi Azad Shawon (Assistant Professor, Faculty of Engineering, AIUB).

https://www.aiub.edu/seminar-on-use-of-machine-learning-and-deep-learning-in-biomedicalsignal-classification-and-their-applications-in-healthcare





## AIUB inks MoUs with Amity University Tashkent (AUT) and Kimyo International University (KIUT)

In the face of increasingly interconnected and complex global challenges, international collaboration between universities has become more crucial than ever. By fostering partnerships across borders, institutions can pool their expertise, resources, and insights to address pressing issues that demand collective action. International collaboration is not just about sharing knowledge and resources, but rather about building bridges of understanding, fostering mutual respect, and creating a sense of shared responsibility for the future of our planet. Institutions of higher education around the world are embracing the power of international collaboration to tackle a wide range of challenges, from climate change and pandemic preparedness to sustainable development and global health equity. And the American International University – Bangladesh (AIUB) has always proactively pursued constructive cooperation across borders in order to better equip its students to compete on a global landscape. These partnerships are not only advancing knowledge and innovation but also promoting cross-cultural collaboration. To further that notion, 2 Memorandums of Understanding (MoUs) were signed with Amity University Tashkent (AUT) and Kimyo International University (KIUT) on the 23rd of November 2023, by Dr. Carmen Z. Lamagna, Vice Chancellor In-Charge and Member, Board of Trustees, AIUB, Mr. Babur Abdullaev, Chief Executive Officer, AUT, and Prof. Janpolat Kudaybergenov, Rector, KIUT.

This strategic alliance marks a significant step forward in advancing higher education and research in Bangladesh and beyond. The MoU outlines a comprehensive framework for collaboration between the two institutions, encompassing key objectives of promoting curriculum development, supporting doctoral studies, and enhancing institutional capacity building. The agreement facilitates the mutual participation of the partners' students and staff, providing them with the opportunity to enhance their academic qualifications and research expertise. This exchange of knowledge and expertise will undoubtedly contribute to the advancement of the academic programs and research endeavors for all the partners. The MoUs also underscore the commitment of both AIUB, AUT, and KIUT to support the enhancement of the skills and knowledge of the students and staff of the 3 institutions in the ever-evolving IT industry. Formalizing the collaborative partnerships mark a significant milestone for AIUB, AUT, and KIUT, in their commitment to leverage their expertise and resources to advance higher education and research, fostering innovation, and preparing future leaders for the challenges and opportunities of the digital era. As the world becomes increasingly interconnected, the need for international collaboration will only grow. As institutions of higher education, there is a critical role to play in addressing global challenges and fostering a more sustainable and equitable future for all, and together, AIUB, AUT, and KIUT intends to work towards creating a better and brighter one for the generations to come.

https://www.aiub.edu/aiub-inks-mous-with--amity-university-tashkent-aut-and-kimyo-internationaluniversity-kiut







## Seminar on "Latest advancements on the use of Artificial Intelligence for Medical Imaging research."

On January 31, 2023, the Faculty of Engineering (FE), American International University-Bangladesh (AIUB) organized a seminar titled "Latest advancements on the use of Artificial Intelligence for Medical Imaging Research". This seminar was supported by the Engineering Students Association of Bangladesh (ESAB) AIUB Unit Face. The session began at 3:30 PM with around 100 attendees in the Media Studio, Annex 2.

The program started with the opening remarks by Prof. Dr. A.B.M. Siddique Hossain (Dean, Faculty of Engineering, AIUB). He discussed the different domains and uses of artificial intelligence (AI) in everyday life. He also highlighted research prospects, where AI may play a significant part in enhancing the outcome of any project. Following that, former faculty of Department of Electrical and Electronic Engineering (EEE), AIUB Dr. Susmita Saha (Research Academic of Turner Institute of Brain and Mental Health, Monash University, Australia) discussed medical imaging and many sorts of modalities in her speech. In addition, she emphasized the potential of AI and its application in medical imaging in her talk. Apart from that, she went into further detail on a few of her deep learning and machine learning-based research topics in the second part of her presentation. Finally, she concluded the talk by showcasing some of her current research work in the area of medical science employing artificial intelligence. At the end of the seminar, a short question and answer session was held where the speakers answered the queries raised by the faculty members and participants.

Prof. Dr. Mohammad Abdul Mannan (Director, Faculty of Engineering, AIUB) concluded the seminar by thanking the speakers. Later, he along with Prof. Dr. Engr. Muhibul Haque Bhuyan (Professor, Department of Electrical and Electronic Engineering, AIUB) handed over the plaque of gratitude to the honorable speaker.

https://www.aiub.edu/seminar-on-latest-advancements-on-the-use-of-artificial-intelligence-formedical-imaging-research



## 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





### Visit to Bangladesh Naval Academy (BNA)

On December 26, 2022, the Faculty of Engineering, American International University – Bangladesh (AIUB) organized a visit to the Bangladesh Naval Academy (BNA). BNA is situated at the mouth of the Karnaphuli River at Patenga, Chittagong District, Bangladesh. It is a reputed military institution for naval training in Southeast Asia and performs the task of developing commissioned officers to lead the future Bangladesh Navy. 14 teachers from AIUB along with 37 students from Department of EEE and IPE participated in this visit. The team from AIUB reached BNA at 4:00 PM and stayed there for approximately 2 and half hours.

Upon the team's arrival, they were warmly received by Cdre Jahangir Adil Samdany, (TAS), NGP, ndc, psc, BN, and lead to the auditorium by the Training Coordinating Officer (TCO). Next, an officer provided a presentation explaining the history, institutional structure, training curriculum, semesterwise description of basic cadet training, graduation requirements and available opportunities upon graduating from the academy. He explained how all cadets of the Bangladesh Navy undergo 10 weeks of joint services training in Bangladesh Military Academy (BMA) alongside the Army and Air Force cadets. Next, they continue for another 15 months training at BNA, which is followed by 6 months of sea training. Upon graduation, cadets are commissioned in Bangladesh Navy as Sub Lieutenant after 3 years of training and receive a Bachelor of Science Degree (BSc). The presentation was followed by a brief question answer session and a trip to the BNA library.

Prof. Dr. Md. Abdur Rahman (Pro Vice-Chancellor, AIUB) expressed thanks to the authority of the academy for their tremendous support and offered a token of appreciation to Cdre Jahangir Adil Samdany. Lastly, the visiting team took a group photo in front of the BNA BANGABANDHU complex with all the participants from AIUB and enjoyed a walk watching the sunset at the West Point of BNA.

https://www.aiub.edu/visit-to-bangladesh-naval-academy-bna





## Seminar on "EEG Signal Processing & Application to the Neurofeedback: Operant Conditioning of Brain and Behaviors".

On Thursday, 22nd June 2023, the IEEE EMBS AIUB Student Branch successfully hosted a seminar titled "EEG Signal Processing & Application to the Neurofeedback: Operant Conditioning of Brain and Behaviors". This seminar was organized in collaboration with the IEEE AIUB Student Branch and Centre for Biomedical Research (CBR), Dr. Anwarul Abedin Institute of Innovation. The event was held with the purpose to raise and increase public understanding about EEG Signals and Neurofeedback and develop its knowledge among the population.

The seminar was inaugurated by the Advisor of IEEE AIUB Student Branch Prof. Dr. A.B.M Siddique Hossain, Dean, Faculty of Engineering, AIUB. During his speech, he briefly explained about electrical signal and signal processing along with what neurons are and their specifications. After the inaugurating speech, the distinguished speaker of the session, Prof. Dr. M.O.K Wahedi, MBBS(BD), MRCP (UK), MRCPCH (UK), FRCP (Edin), DCH(Hon's) Ire NUI, MSc ECD (BRACU); Professor of Pediatrics & Child Health, took the floor as the speaker of the session. He introduced the audience to EEG (electroencephalogram) and QEEG (quantitative electroencephalogram), explaining how these techniques are used to record and analyze brain activity. He explained the digital processing of EEG signals and the application of QEEG, highlighting their role in brain mapping and understanding brainwave characteristics. Furthermore, he provided an overview of the neurofeedback market and discussed the types of brainwaves that EEG measures, emphasizing the different brainwave patterns and frequencies. Afterwards, he shared his real-life experiences and discussed the use of neurofeedback in treating conditions such as ADHD, autism, epilepsy, depression, and anxiety. Before concluding his session, he discussed training programs and awareness related to neurofeedback, along with additional research in the field and demonstrated the outcomes and processes through a video, providing a practical illustration of neurofeedback in action. Advisor of IEEE AIUB Student Branch, Prof. Dr. Mohammad Abdul Mannan, Associate Dean, Faculty of Engineering, AIUB delivered the closing remarks of the session where he encouraged participants to carry out research in this field.

The event concluded with Prof. Dr. A.B.M Siddique Hossain and Prof. Dr. Mohammad Abdul Mannan providing the token of appreciation to the distinguished speaker. This seminar also focused to raise awareness on good health and wellbeing, which aims to ensure healthy lives and promotes well-being for all at all ages. A total of 50+ participants attended the seminar. Counselor of IEEE AIUB Student Branch, Dr. Mohammad Hasan Imam, Associate Professor, Faculty of Engineering, AIUB, Ms. Humayra Fredous, Deputy Director, Center for Biomedical Research (CBR), Dr. Anwarul Abedin Institute of Innovation and Head-in-Charge, Department of Physics, AIUB, Dr. Md. Humayun Kabir, Associate Professor, Faculty of Engineering, AIUB attended the event.

https://www.aiub.edu/seminar-on-eeg-signal-processing--application-to-the-neurofeedback--operantconditioning-of-brain-and-behaviors





### Webinar on 3D Bioprinting: Exploring the Future of Medicine .

On Thursday, 23rd November 2023 the American International University-Bangladesh (AIUB) hosted the webinar in collaboration with the Faculty of Engineering and the Industrial and Production Engineering (IPE) department, with support from the IEOM AIUB Student Chapter. The event, titled "3D Bioprinting: Customization and Personalization" featured Dr. MD Ahsan Habib, Assistant Professor, Rochester Institute of Technology; as the distinguished speaker.

Along with Dr. MD Ahsan Habib, present with us on this webinar were Prof. Dr. ABM Siddique Hossain (Dean & Professor, Faculty of Engineering, AIUB), Prof. Dr. Mohammad Abdul Mannan (Associate Dean, Faculty of Engineering, AIUB), Dr. MD. Ehasanul Haque (Senior Assistant Professor, Department Head of IPE, Faculty of Engineering, AIUB) and Mr. Mahamudul Hassan (Assistant Professor, Faculty of Engineering, AIUB) and Mr. Mahamudul Hassan (Assistant Professor, Faculty of Engineering, AIUB). The webinar commenced with a warm welcome and introduction by the hosts, shedding light on AIUB's commitment to fostering knowledge exchange and innovation. The IEOM AIUB Student Chapter, known for its dedication in promoting industrial engineering and operations management, played a crucial role to support the event. The Honorable Dean of the Faculty of Engineering addressed the audience, emphasizing the significance of the webinar's theme and expressing the university's commitment to staying at the forefront of technological advancements. His words set the stage for an enlightening exploration of 3D bioprinting. Dr. MD Ahsan Habib then took the virtual stage, delivering an engaging presentation that began with an overview of 3D bioprinting. Drawing from his extensive experience, he shared insights into the world of bioprinting, highlighting how the scarcity of organ transplants drove his passion for advancing this field. The audience was captivated as he explained the intricate workings of bioprinters, showcasing his own noteworthy contributions and projects.

The core of the presentation revolved around the customization and personalization aspects of 3D bioprinting. Dr. Habib delved into the co-printing of soft and hard biomaterials, illustrating how this technique allows the creation of tailored solutions to meet individual needs. He also discussed the integration of mathematical functions in bioprinting, demonstrating the interdisciplinary nature of this cutting-edge technology. Addressing the hardware design and manufacturing aspects of bio fabrication, Dr. Habib expressed gratitude to his dedicated team for their collaborative efforts. His presentation concluded with a glimpse into the future possibilities of 3D bioprinting, leaving the audience inspired and informed. Finally, the question-and-answer session provided participants, primarily students, with an opportunity to engage directly with Dr. Habib. As a token of appreciation for his invaluable contribution, Dr. MD Ahsan Habib was presented with a virtual appreciation. The Associate Dean, Department Head of IPE, and the Faculty Advisor of IEOM expressed their gratitude, acknowledging the speaker's expertise and the seamless collaboration that made the webinar a success. This webinar successfully covered the following goals out of the 16 Sustainable Development Goals set forth by the UN: Good health and well-being (SDG 3), Reduced inequalities (SDG 10), Climate action (SDG 13), Life below water (SDG 14) and Life on land (SDG 15).

https://www.aiub.edu/webinar-on-3d-bioprinting-exploring-the-future-of-medicine-



## Faculty Research and Publication on SDG 3

### 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/

## Elderly Patient Monitoring and Fall Detection Using mmWave FMCW Radar System

### DR. MD. HASAN IMAM et el.

Frequency Modulated Continuous Wave radar is nowadays considered as an important technology to monitor the health condition, fall condition and activities of elderly patients for their well-being and safety. Infrared Proximity (IP) and Passive Infrared (PIR) camera systems have traditionally been used for this purpose, but this system has crucial limitations, especially with regards to fast detection technique for such as preventing accident in the bathroom and indoor environment. The use of surveillance cameras not only struggles at nighttime detection but also can compromise patients' privacy, such as bathroom activities. FMCW radar technology can operate effectively in no-light conditions making them particularly suitable for nighttime monitoring by addressing privacy concerns. The principles of FMCW radar, signal processing algorithms and methods are discussed in this paper. Depending on the type of motion activity, a patient's returning radar signal will exhibit varying Doppler effect properties. This technology not only enhances patient care but also relieves healthcare providers and families from the need for constant in-room surveillance. FMCW radar technology bridges the gap between patient privacy concerns and the necessity for improving patient healthcare. This paper explores the utilization of FMCW radar for monitoring elderly patients and fall detection, with the goal of developing a privacy friendly app-based solution for real-time remote patient activity tracking.

## Perceived Stress and Stressors Among Undergraduate Students: A Study in Bangladesh

### SAMIA SHABNAZ et el.

Background and objective: For a low- and middle-income countries like Bangladesh, it is evident that university students are more inclined to mental health illnesses like depression compared to the general population. The performance of a person with depression is often poor at work, school or in family environment. According to World Health Organization, 2020a, depression is the second leading cause of suicidal death among the age group 15–29. The increasing suicidal rate among university students indicating the need to investigate the stress level and the stressors to formulate appropriate support services for university students to ensure mental health wellbeing and suicide prevention.

Method: The study uses a structured questionnaire using a 5-point Likert scale to collect data from 472 university students of Bangladesh. A convenience sampling technique was followed for the Study to collect primary data from. Data entry and analysis were done with the statistical software SPSS version 20. Descriptive statistics Cronbach's alpha and factor analysis were used to examine the demographic profile of the respondents, reliability, significant stressor respectively.

Result: The study investigated several contributing factors of stress, anxiety, and depression among students which includes academic and non-academic stressor like socioeconomic, environmental, cultural to psychological attributes.

Conclusion: As stress have a high detrimental effect to individual and society, there is a need for greater attention to the psychological wellbeing of undergraduate students to improve their quality of life. This study can be used to develop intervention programs and will help adopt appropriate preventive measures and practices to alleviate psychological consequences.

#### https://www.isa-sociology.org/en/conferences/world-congress/melbourne-2023

## Setting Up an Academic Research Clinic & Cancer Centre: An Approach to Industry-Academia Collaboration in Health Sector in Bangladesh

#### DR. HUMAYRA FERDOUS et el.

Industry-academia collaboration is the partnership between academic and industrial institutes where both types of knowledge and skills are gathered to solve different problems efficiently for the purpose of commercial and economical achievement. The reason for industry-academia collaboration is to find interactive elements such as teaching, research and care. These elements must be closely linked together in order to achieve maximal value for the collaborative. Bangladesh is a largely populated country (around 17 billion) where common peoples suffer from different diseases like cancer, diabetes, heart disease, kidney problem. Research and innovation in the health care sector is very negligible compared to other sectors like education,

agriculture etc. The main aim of this work is to establish an academic research clinic & Cancer Centre. This paper demonstrates an approach of collaboration between health care clinics, university and industry. One of the key challenges of the sustainable development goal (SDG) are healthy life, well-being, sustainable industrialization, innovation and global partnership. To achieve SDG goal, collaborative approach between Rayhans Radiance Clinic & Cancer Centre (RRCCL), Centre for Biomedical Research (CBR) and American International University Bangladesh-(AIUB) were reviewed in this work. The vision of this collaboration is to devolve a business model in the area of medical physics, biomedical technology and cancer care by a collaboration between clinic, university and industry. RRCCL offer different fellowship to postgraduate student at different university to contribute research in the area of medical physics, biomedical physics, radiation oncology and public health. Centre for Biomedical Research (CBR) is one of the biomedical research labs at American International University Bangladesh-(AIUB) that focus on solving different research problems such as imaging of biological systems, biophysics, medical physics, biomedical engineering, theoretical and computational modeling of complex brain diseases. In the initial stage we start with services like consultation, diagnostic, telemedicine, contemporary biomedical or clinical engineering research and development. Systematic plan and framework have been initiated to develop a public private partnership (PPP) model to set up academic clinics in different regions of Bangladesh. By applying our collaborating output, we want to provide modern healthcare tools to the common people in our country for better diagnosis and treatment

#### https://bicc2023.oncologyclub.org/

## Developing an Advanced Smart Inhaler for Comprehensive Health Monitoring and Early Identification of Lung Cancer Risk

#### DR. HUMAYRA FERDOUS et el.

Introduction: Respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD) pose significant health challenges and are often associated with an increased risk of lung cancer. This project proposes the development of a smart inhaler that not only assists individuals in managing their respiratory health but also integrates data analysis techniques to assess the potential risk of lung cancer. The smart inhaler aims to provide a holistic approach to health management by monitoring patient health conditions, medication usage, symptoms, and environmental factors.

Methods: The smart inhaler project involves the creation of a technologically advanced device that incorporates various sensors to collect data related to inhaler usage, lung function, symptom patterns, air quality, and geolocation. The collected data is then integrated into a centralized database for analysis. Machine learning algorithms are employed to identify correlations between inhaler usage, symptom severity, environmental pollution levels, and potential cancer risk. An early warning system is designed to alert users and healthcare professionals of significant changes in health indicators or environmental exposures.

Results: The developed smart inhaler offers a comprehensive solution for health monitoring and cancer risk assessment. Users can track their inhaler usage, lung function, and symptoms in real time through a user-friendly mobile app or web portal. Environmental sensors provide insights into air quality and its impact on respiratory health. The machine learning algorithms successfully analyze the collected data, leading to the creation of predictive models for assessing the user's risk of developing lung cancer. Conclusion: The integration of smart technology into inhaler devices represents a significant advancement in respiratory health management. By monitoring patient health conditions, medication usage, symptoms, and environmental factors, the smart inhaler empowers individuals with respiratory conditions to make informed decisions about their health. Moreover, the incorporation of data analysis techniques for cancer risk assessment enhances early detection and intervention. This project bridges the gap between respiratory health and potential cancer risk, contributing to improved quality of life and proactive health management for individuals with lung diseases. Through this innovative approach, the smart inhaler offers a valuable tool for both patients and healthcare providers in optimizing respiratory care and assessing cancer risk in a synergistic manner.

#### https://bicc2023.oncologyclub.org/

### Renewable Energy Base Ventilator Using Arduino

### DR. HUMAYRA FERDOUS et el.

Ventilators have emerged as crucial life-support device during the COVID-19 pandemic, offering critical respiratory assistance to patients with severe breathing difficulties . We propose a system that have apioneering solution in the form of a Renewable Energy-Based Ventilator using Arduino, designed to address some challenges and revolutionize the healthcare sector. This system reduces dependancy on conventional energy sources and lower carbon emissionsby providing a sustainable and dependable source of electrivity from solar through battery as a vital energy storage component that enables the Renewable-Based ventilator to run continously and aunomously even when there is little or no sunlight available to power the system. Healthcare practitioners can manage respiratory conditions using real-time pressure and oxygen data on the integrated display. This project addresses the challenges of healthcare accessibility in remote and resource constrained arear, where reliable electricity supply may be limited.

## An Affordable Solution for the Rural Farmers for Irrigation Purpose Including Hybrid Power Source using Solar and Biogas

### DR. CHOWDHURY AKRAM HOSSAIN et el.

The use of fossil fuels to generate the ever-increasing demand for energy is proving to be a very strong reason behind the global warming issue. The hybrid power system is a combination of different technologies to produce Electricity. In Bangladesh, farmers experience several irrigation-related problems due to a shortage of energy. This paper deals with an economical hybrid power system that uses the grid, solar, and biogas generator that offers a fresh approach to solve this problem. Since it

is impossible to always have sunlight, a biogas generator would be used to generate electricity and charge a battery to satisfy the requirements and a grid connection will be a backup for both biogas and sunlight absence. Based on the priority, the user will be able to switch among the three sources for efficient use of power. This hybrid system will contribute to our country's increasing demand for power management by serving the less resourceful farmers from rural areas. In this research, hardware and simulation findings have been examined from Bangladesh's perspective. Since it is based on renewable energy sources, this initiative presents a novel solution to Bangladesh's emerging power crisis issue.

## Design and Implementation of a Low-cost Solar Charged Portable Disinfectant Chamber

### DR. CHOWDHURY AKRAM HOSSAIN et el.

Health safety is always one of the key concerns for human lives. During this current pandemic, people have become more aware of this fact and have started following different precautions. In this paper, we have discussed a prototype of a cost-efficient and environmentally friendly disinfection chamber that can help to solve the public health risk that was brought to our attention. Currently, power generation costs have also increased due to inflation and fuel price hikes. There is a lack of power supply for that. To ensure the proper demand for power, the whole world focused on renewable energy. While developing the prototype, we tried to use the widely available resources in our local market so that it reduces the cost as well as can be easily repairable and upgradeable. Although we have used solar panels in the system, due to the portability and availability of power, we have also used a battery system which can supply power to the chamber for over 8 hours. We also discussed a few future works on the proposed system, with a focus on solar system improvement.

## Medical Named Entity Recognition (MedNER): A Deep Learning Model for Recognizing Medical Entities (Drug, Disease) from Scientific Texts

### DR. MD. SAEF ULLAH MIAH et el.

Medical Named Entity Recognition (MedNER) is an indispensable task in biomedical text mining. NER aims to recognize and categorize named entities in scientific literature, such as genes, proteins, diseases, and medications. This work is difficult due to the complexity of scientific language and the abundance of available material in the biomedical sector. Using domain-specific embedding and Bi-LSTM, we propose a novel NER model that employs deep learning approaches to improve the performance of NER on scientific publications. Our model gets 98% F1-score on a curated data-set of Covid-related scientific publications published in multiple web of science and pubmed indexed journals, significantly outperforming previous approaches deployed on the same data-set. Our findings illustrate the efficacy of our approach in reliably recognizing and classifying named entities (drug and disease) in scientific literature, opening the way for future developments in biomedical text mining.

## Understanding the Dynamics of Dengue in Bangladesh: EDA, Climate Correlation, and Predictive Modeling

### DR. MD. SAEF ULLAH MIAH et el.

Dengue, a mosquito-borne viral infection, poses a significant threat, especially in warm, tropical climate countries like Bangladesh, India, Thailand, Malaysia, Laos, etc. This study is solely focused on the dengue data of Bangladesh as it explores the historical dengue data spanning 23 years (2000 to 2022) for EDA purposes, with a focus on 9 years (2014–2022) divisional data for model performance analysis. Additionally, climate data was collected for the same period to examine the potential correlation between dengue cases and climate factors. Machine learning (ML) and Deep learning (DL) models, including Random Forest Regression (RFR), Long Short-Term Memory (LSTM), and LSTM with Artificial Neural Networks (ANN), were implemented and validated against ground truth data. The results reveal notable differences in performing LSTM when compared to the ground truth data. The study uncovers significant correlations between dengue cases and climate factors like humidity, temperature, and precipitation. The insights gained from this research have practical implications for dengue prevention and control efforts in Bangladesh and beyond, paving the way for more effective strategies and interventions.

## Impact of Women's Autonomy and Socio-economic Factors on Delivery Assistance in Bangladesh

#### DR. M. MOSTAFIZUR RAHMAN et el.

The article is focused to derived a method to calculate women's autonomy and selected socioeconomic factors including women's basic education or basic literacy, wealth index, newspaper reading practice as well as television watching practice on delivery assistance in Bangladesh. The PLS-SEM technique was employed to meet the objective. The significance of the associations has also been evaluated. The analytical outcomes of the study designated that women's autonomy had a significantly negative impact on delivery assistance whereas the selected socio-economic factors had a significantly positive impact on delivery assistance. Furthermore, the selected socioeconomic factors demonstrated a significantly negative effect on women's autonomy in developing countries. PLS-SEM model's reliability is also explained to show the functionality of the model.

https://ieeexplore.ieee.org/xpl/conhome/10199108/proceeding

## Identification of Human Movement through a Novel Machine Learning Approach

#### MD. SAJID HOSSAIN et el.

This study aims to identify human movement activities using machine learning, focusing on a novel ensemble approach. The objectives are twofold: to apply a new machine learning method for activity recognition and to outperform recent approaches in accuracy. A standard dataset from Kaggle contained six activities: standing, sitting, lying, walking, walking downstairs, and walking upstairs. The study used an SVM and Logistic Regression ensemble alongside other standard classifiers. The proposed ensemble achieved an accuracy of 95.45% on the test data, surpassing other models. This research shows the potential of the ensemble approach for accurate human movement identification with potential uses in various domains.

https://ieeexplore.ieee.org/document/10434296

### Rehabilitation for Stroke Survivors: The Development of a Smart Glove

#### MD. SAJID HOSSAIN et el.

This research presents the development of a portable arm rehabilitation device designed to continuously monitor and enhance rehabilitation activities. The device incorporates flex sensors, force-sensitive resistors, and accelerometers interfaced with an ESP32 microcontroller to collect data on arm movements. This data is crucial for therapists to fine-tune treatment plans and provide patients with an effective home-based rehabilitation solution. Recent findings have shown the potential of home-based rehabilitation, yet existing technologies are often costly and complex to operate independently. The device aims to bridge this gap by offering a user-friendly and affordable solution. The system integrates various sensors, including flex sensors, force-sensitive resistors, and accelerometers, which are interfaced with an Arduino microcontroller. These sensors capture data related to arm movements, which is essential for therapists to tailor treatment plans and for patients to track their progress. The device aims to bridge the gap between costly and complex rehabilitation technologies and the need for accessible, home-based solutions. The study's novelty lies in its integration of sensor technology into a smart glove and its commitment to providing an affordable and effective rehabilitation solution. The continuous monitoring capabilities of the device offer valuable insights into patients' progress, improving the quality of rehabilitation programs. This work aligns with recent advancements in wearable technology and sensor systems for healthcare applications, emphasizing the importance of accessible rehabilitation solutions.

https://ieeexplore.ieee.org/document/10441307

### A Smart Helmet: Ensuring Safety of Bike Riders

### DR. SHAMEEM AHMAD et el.

The number of bike accidents is rising daily. Numerous people have suffered serious injuries and lost their lives as a result of bike accidents. Bike riders can reduce their risk of collisions by wearing helmets. The advantages of smart helmets include a decrease in the number of bike accidents. The primary cause of fatality in the majority of accidents is a lack of quick first aid and emergency medical assistance. One of the primary causes of this might be the ambulance's late arrival, with no one at the scene of the accident to provide information to the ambulance. The objective of this paper is to develop a smart helmet powered by renewable energy that will ensure the safety of bikers. The helmet includes an Arduino as a microprocessor, Global System for Mobile communication (GSM) for phone calls, Global Positioning System (GPS) for tracking, and vibration sensors to detect accidents within a minute of detecting the accident, the system calls the registered number with a message and the precise position. Furthermore, if the user exceeds the average speed limit, the speed sensors will warn them. The rider can summon help in an emergency by activating the emergency switch. If the rider is not wearing a helmet, the bike will not start. Solar energy powers the prototype in its entirety. From the result analysis, it has been found that the developed helmet can provide safety to the bikers by conveying accurate and real-time information on accidents within minutes.

## Trends of Maternal and Child Health in Bangladesh with Associated Factors: Evidence from the Demographic and Health Surveys between 1997-2017

#### MD. MORTUZA AHMMED et el.

The goal of this study is to identify the trends of maternal and child health in Bangladesh along with associated factors between 1993 to 2017. To fulfil this objective, data from all the Bangladesh Demographic and Health Surveys conducted so far have been considered. Between 1993 to 2017, the maternal mortality rate (per 1000 live births) declined from 4.70 to 1.96, while the total fertility rate dropped from 3.44 to 2.30. During that period, neonatal mortality rate was dropped by 2.2%, post-neonatal mortality by 2.7%, infant mortality by 4.9%, child mortality by 4.3% and under-5 mortality by 9.8%. Substantial progress has been observed in associated socio-demographic factors during this period, resulting in better maternal and child health status. Findings of the study would not only lead the way for future research concerning maternal and child health, but also enable the policy-makers to forecast correctly and take apposite decisions accordingly to ensure safe maternal and child health. Further research is recommended to identify the reasons for underutilization of optimal level maternal and child health care services in Bangladesh.

## Impact of Women's Autonomy and Socio-economic Factors on Delivery Assistance in Bangladesh

MD. MORTUZA AHMMED et el.

The foremost idea of this study was to assess the effects of females' autonomy and selected socioeconomic factors including women's education, wealth index, newspaper reading practice as well as television watching practice on delivery assistance in Bangladesh. The PLS-SEM technique was employed to meet the objective. The significance of the associations has also been evaluated. The analytical outcomes of the study designated that females' autonomy had significantly negative effect on delivery assistance whereas the selected socio-economic factors had significantly positive effect on delivery assistance. Furthermore, the selected socio-economic factors demonstrated significantly negative effect on women's autonomy. The consistency and legitimacy of the considered PLS-SEM model was also established as well.

https://icaisc.in/

## Health Effects of Digital Device Usage on Students during Covid-19 in Bangladesh: A Statistical Approach

### MD. MORTUZA AHMMED et el.

Digital dividends are described as the economic growth, employment creation, and provision of financial and non-financial services that result from the use of digital technologies. Digital dividends were widely used during the COVID-19 pandemic. However, the question remains as to how they have impacted students who used them in their daily life for academic objectives. The main target of this research to find out or evaluate the digital devices performance and health effects of these devices usage on students during the pandemic COVID-19 period in Bangladesh. The primary data set is a random collected from different educational institutes. Overall 114 data is collected in a random selection through a survey form. Primary data was collected through a survey based on 114 randomly selected students from different educational institutions. The relation between the variables was tested by chi-square analysis. Outcomes of chi-square analyses show that factors like age, residential origin, device at home, device usage per day, device adaptability, internet source and internet speed had significant association with health effects on respondents due to digital device usage during COVID-19.

## Numerical Narratives: Statistical Analysis of Healthcare Institutions in Bangladesh

MD. MORTUZA AHMMED et el.

A significant segment of the population in Bangladesh lacks access to quality healthcare, posing a challenge to the fundamental human right of health. The absence of a robust healthcare system has far-reaching implications across various socio-economic domains. This study aims to provide a detailed analysis of key aspects of non-government healthcare institutions in Bangladesh, encompassing institutional ownership, growth trends, workforce distribution, waste management practices, fire safety measures, and selected financial dimensions. Data essential for achieving the study's analytical objectives were gathered from the Bangladesh Bureau of Statistics (BBS) survey of private healthcare institutions conducted in 2019. The findings reveal substantial growth in the non-government healthcare sector from 1990 to 2018, predominantly characterized by private ownership. Most of the workforce is comprised of full-time staff, with approximately 80% of non-government hospitals adhering to waste management and fire safety protocols. Hospitals emerge as the primary revenue generators among various non-government healthcare institutions. The analytical insights from this study offer policymakers valuable information to assess and address critical aspects of non-government healthcare institutions in Bangladesh, facilitating informed decision-making and effective policy implementation.

#### https://ieomsociety.org/bangladesh2023/

## Dengue Dynamics in Bangladesh: Unveiling Insights through Statistical and Machine Learning Analysis

#### MD. MORTUZA AHMMED et el.

Dengue fever remains a significant public health concern in Bangladesh, with recurring outbreaks posing substantial challenges to healthcare systems and communities. This study provides a concise overview of a comprehensive study aimed at unravelling the dynamics of dengue in Bangladesh through a synergistic combination of statistical and machine learning analyses. By applying statistical techniques, we first identify temporal and spatial patterns, uncovering seasonal trends, hotspot regions, and fluctuations in dengue incidence. The trend of safe childbirth practices gradually increased between 2000 to 2023. Dhaka, the capital city of Bangladesh, and its surrounding areas in the Dhaka Division showed a high number of dengue cases and deaths. The knowledge and awareness level about dengue was significantly higher for educated respondents (OR = 1.89, 1.21 -1.97), residing in semi-urban regions (OR = 1.35, 0.93 – 1.41), female (OR = 1.39, 1.14 – 1.62), living in Dhaka division (OR = 3.72, 2.89 - 3.88), and housewife (OR = 1.52, 1.26 - 1.89). This initial analysis allows us to pinpoint high-risk areas and periods, facilitating targeted intervention strategies. In tandem with traditional statistical methods, we harness the power of machine learning to develop a predictive model which is capable of forecasting dengue outbreaks with enhanced accuracy. In conclusion, this study represents a comprehensive effort to deepen our understanding of dengue dynamics in Bangladesh. By combining statistical analyses with machine learning technique, we aim to provide actionable insights that can inform public health policies and interventions. Our findings have the potential to guide the allocation of resources, improve preparedness, and ultimately mitigate the impact of dengue fever in Bangladesh, offering a valuable framework for addressing similar challenges in other regions grappling with vector-borne diseases.

https://tehi2023.iitju.edu.bd/?fbclid=lwAR3X24RyVvZZFh05CL4BuJ9DHAiFrNjVu34oLalNYwCnwyU tXi6T\_JG2Qq8

## Exploring the Evolving Landscape of Maternal and Child Health in Bangladesh: A Comprehensive Analysis of Three Decades

MD. MORTUZA AHMMED et el.

Objective: This study aims to analyze the trends in maternal and child health in Bangladesh from 1993 to 2022, along with the factors associated with these trends.

Design and Methods: The research utilizes data from all the Bangladesh Demographic and Health Surveys conducted during this period. Descriptive statistics along with graphical presentations have been accomplished through SPSS and MS Excel.

Results: Over the span of 1993 to 2022, significant improvements have been observed in maternal and child health indicators. The maternal mortality rate declined from 470 to 123 (per 100000 live births), while the total fertility rate dropped from 3.44 to 2.00. Additionally, there were notable reductions in under-5 mortality as well (declined from 133 to 31 per 1000 live births). The study highlights the positive impact of various socio-demographic factors including origin of residence, education, wealth index, mass media access, delivery place, antenatal care, delivery assistance etc. on the improvement of maternal and child health during this period. These findings not only contribute to the existing knowledge but also provide valuable insights for future research in the field of maternal and child health.

Conclusion: Policymakers can utilize these findings to make informed decisions and accurately forecast the needs and requirements for ensuring the well-being of mothers and children. It is recommended to conduct further research to identify the reasons behind the underutilization of optimal maternal and child healthcare services in Bangladesh. By understanding these reasons, appropriate measures can be taken to address the gaps and enhance the utilization of such services.

https://publichealthfoundation.org.bd/9th-international-conference/

# Trends and Differentials of Dengue in Bangladesh: A Cross-sectional Study

MD. MORTUZA AHMMED et el.

Objective: This study aims to analyze the trends of dengue in Bangladesh between 2000 to 2023 along with associated differentials.

Design and Methods: The research utilizes primary data collected from 700 randomly selected dengue affected patients of different public and private hospitals across the country between August 26 to September 14, 2023. Besides, secondary data was assembled on all confirmed dengue cases reported to the Directorate General of Health Services (DGHS) from 2000 to 2023 to visualize the trends over the years. Descriptive statistics along with graphical presentations have been accomplished through SPSS and MS Excel.

Results: Based on the study's findings, there were 93 recorded deaths attributed to dengue in the year 2000. Subsequently, dengue cases have persisted annually within the country. From that point onward, a total of 853 individuals have succumbed to dengue-related complications up until 2022. Furthermore, in the current year, from the beginning of the year through September 20, there have been an additional 867 fatalities attributed to dengue. The study also found that dengue is more common in urban areas than in rural areas, and that males are more likely to be infected with dengue than females. Children and adolescents are also at an increased risk of dengue infection. Additionally, the study found that dengue is more common among people with lower socioeconomic status.

Conclusion: This cross-sectional study provides a comprehensive assessment of the evolving landscape of dengue in Bangladesh, offering insights into the disease's trends and determinants. The findings serve as a valuable resource for policymakers, healthcare professionals, and researchers, facilitating evidence-based decision-making in the ongoing efforts to combat dengue and enhance public health in Bangladesh.

https://publichealthfoundation.org.bd/9th-international-conference/

## Statistical exploration and projection of SDG-3 in Bangladesh through DHS: a study on data-driven perspectives using logistic regression

### MD. MORTUZA AHMMED et el.

Maternal and child health is of top priority by the government of Bangladesh. To reach Sustainable Development Goal 3 (SDG 3) addressing good health and well-being, this study explored different facets of maternal and child care in Bangladesh. This study broadly assessed socio-demographic factors and used stepwise logistic regression on data from the Bangladesh Demographic and Health Survey (BDHS) to investigate their influence on safe delivery by mothers. Also, the study examined the trends of these factors over time. The results show significant improvements in the selected socio-demographic factors, leading to better maternal and child health outcomes. Findings of the study revealed that women with higher education, residing in urban areas, having access to mass media, receiving antenatal care, delivering in healthcare facilities, and possessing greater financial resources were significantly more likely to receive assistance from medically trained professionals (MTPs) during childbirth. The results underline the significance of education, media accessibility,

urban living, institutional childbirths, antenatal care utilization, and financial well-being in ensuring the involvement of MTPs during delivery. In light of the results, the study recommends a focused plan towards the growth of healthcare facilities, poverty reduction, and education, mainly in rural areas. By prioritizing these issues, significant advancements regarding SDG 3 in Bangladesh can be accomplished, subsequently fostering heightened maternal and child health outcomes.

https://www.icmlde.org/

## A vision transformer-based approach for recognizing seven prevalent mango leaf diseases

#### NAZIA ALFAZ et el.

Plant diseases, particularly affecting fruit crops, pose a significant challenge to the worldwide supply of fresh food due to their direct impact on the quality of fruits, resulting in an overall decline in agricultural production. The traditional approach of detecting leaf diseases in fruit plants requires farmers to undertake manual inspection which exhibits a lack of reliability and consistency. Moreover, the manual inspection procedure is prone to errors due to its reliance on the farmer's knowledge and skill. Mango referred to as the "king of all fruits", is renowned for its rich composition of various vitamins and vital nutrients. Mangoes are susceptible to many diseases that adversely damage their visual appeal, and flavor, and have significant implications on the overall economy. The identification of diseases affecting mango plant leaves using automated recognition remains a challenge due to the diverse range of symptoms and limited availability of data. There have been several deep learning-based research studies focused on identifying diseases in mango leaves; however, the majority of these studies have employed a convolutional neural network (CNN) trained on a small number of data. This study presents a Vision Transformer (ViT) based approach to detect diseases in mango leaves using publicly available data namely MangoLeafBD. The ViT model has been selected as the detection model due to its parameter efficiency compared to deep CNN models. The ViT has produced remarkable overall classification accuracy of 100%, precision of 100%, recall of 100%, and f1-score of 100% for disease detection on mango leaves which is better than the existing CNN approaches on the MangoLeafBD dataset. This demonstrates that our approach has the potential to assist farmers in the field by providing automated, simple, and more reliable mango leaf disease diagnosis.

https://iccit.org.bd/2023/

## Detection of Parkinson's Disease from T2-Weighted Magnetic Resonance Imaging Scans Using EfficientNet-V2

NAZIA ALFAZ et el.

Parkinson's disease (PD) is a multifaceted neurode-generative disorder that primarily disrupts voluntary motor movements by causing an excitation-inhibition imbalance in the brain. Approximately 10 million people worldwide are affected by PD. However, accurate diagnosis of PD is still challenging in the early stages of this disease due to the similarity of the phenotypes of the neurological disorders. Magnetic resonance imaging (MRI) has played an important role in understanding brain function and disease in neuroimaging. In particular, it can detect structural abnormalities in the brain caused by dopamine deprivation in PD patients leading to excitation-inhibition imbalance. Besides, the utilization of deep learning has emerged as a crucial factor in the identification of Parkinson's disease due to its ability to identify irregularities, and structural changes at a specific location of brain. This study investigates the effectiveness of the deep learning model EfficientNet-V2 in combination with transfer learning for the purpose of identifying the presence or absence of Parkinson's disease in individuals. In contrast to the arbitrary scaling employed by conventional CNN, the EfficientNet-V2 employs a straightforward and efficient compound factor to modify the network dimensions, which facilitates the identification of the optimal set of parameters. The identification is made by analyzing MRI samples obtained from the Parkinson's Progression Markers Initiative, an openly accessible dataset. To reduce bias while analyzing the detection performance and to stabilize the overall performance of the architecture, this study has employed 4-fold cross-validation method during data split. This method has obtained an overall 99.13% accuracy, which is substantially higher than the accuracy of earlier works.

#### https://iccit.org.bd/2023/

## Enhancing Academic Integrity: A Multi-model Deep Learning Approach for Reliable Test Supervision and Dishonesty Detection

#### MD. FARUK ABDULLAH AL SOHAN et el.

Academic evaluations hold substantial importance within global educational establishments, constituting a dependable avenue for gauging students' proficiencies and competencies. However, the widespread occurrence of academic dishonesty presents an extensive hurdle to the credibility and reliability of these appraisal processes. To tackle this issue, we propose a deep learning model that has been particularly designed to ensure dependable test supervision. This system utilizes computer vision, audio analysis, and deep reinforcement learning approaches is to provide educational institutions with a viable and sustainable alternative. This computational model has been devised to enhance computing efficiency and scalability. Successful implementation of such a model will increase the accuracy of identifying academic misconduct by evaluating many cheating indications at once.

https://www.researchgate.net/publication/384355006\_Enhancing\_Academic\_Integrity\_A\_Multi-Model\_Deep\_Learning\_Approach\_For\_Reliable\_Test\_Supervision\_And\_Dishonesty\_Detection

## Design, Simulation, and Implementation of a Multipurpose Automated Fire and Gas Leakage Detection and Prevention System

#### DR. MUHIBUL HAQUE BHUYAN et el.

The main target of this current attempt is to design, simulate, and implement automated fire and gas detection for multiple purposes. This system employs an infrared flame detector sensor module, a buzzer (HQ2) having a working voltage in the range of 3-9 V, a breadboard, a 9 V DC power supply,

connecting wires jumpers, a few LEDs, a gas sensor (MQ2), Arduino Uno, and ribbon IDC wire. At first, all the hardware was connected and then we set up the essential pins. Then we wrote a program in the Arduino IDE for this system. The developed system mainly detects a fire, smoke, and gas from its surroundings. The sensor signals are analog and the microcontroller converts them into digital signals after collecting them and processes the signal and makes decisions within a short period whether to ring the fire alarm or turn on the sprinkler connected to a motorized water pump and motor driver circuit. We are also upgrading it to an IoT-based system so that we can provide a message to the smartphone whenever the sensor detects a gas leakage or flame. The simulation and experimental results agree well.

## CaViT: Early Stage Dental Caries Detection from Smartphone-image using Vision Transformer

#### MD. MAHMUDUR RAHMAN et el.

Caries detection is a routine clinical task in dental practice. If caries are detected at an early stage, non-invasive or micro-invasive treatment such as fillings and a root canal can be effective and thereby invasive treatment and therapies such as gum surgery and dental implants can be avoided. Invasive treatments are expensive and inappropriate for patients with low blood cell counts, cardiac problems and other health issues. Consequently, early caries detection is critical in dentistry. Caries are typically identified through a visual tactile examination in support of radiographic imaging. Fluorescence imaging, cone beam computed tomography or optical coherence tomography are also used. However, these procedures are time-consuming and expensive and require a physical examination of the patient. Moreover, the COVID-19 lessons taught us that such diagnoses should be avoided to prevent contagious diseases. Existing automated caries detection methods fail to achieve sufficient accuracy. Therefore, in this paper, we propose a highly accurate automatic system to detect early caries without any face-to-face interaction with the patient. This system is economical, rapid and easy to use. The proposed system uses a smartphone to capture teeth images and then relies on a vision transformer (ViT) to classify the images as advanced, early or no caries. Finally, the caries are segmented using a U-Net network. The proposed method outperformed the existing methods and achieved a sensitivity of 95%, 91% and 100% for the no caries, early caries and advanced caries classes when tested on a dataset of 300 images, developed for this study.

## 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.

## A Novel Hybrid Approach for Classifying Osteosarcoma Using Deep Feature Extraction and Multilayer Perceptron

### PROF. DR. DIP NANDI et el.

Osteosarcoma is the most common type of bone cancer that tends to occur in teenagers and young adults. Due to crowded context, inter-class similarity, inter-class variation, and noise in H&E-stained (hematoxylin and eosin stain) histology tissue, pathologists frequently face difficulty in osteosarcoma tumor classification. In this paper, we introduced a hybrid framework for improving the efficiency of three types of osteosarcoma tumor (nontumor, necrosis, and viable tumor) classification by merging different types of CNN-based architectures with a multilayer perceptron (MLP) algorithm on the WSI (whole slide images) dataset. We performed various kinds of preprocessing on the WSI images. Then, five pre-trained CNN models were trained with multiple parameter settings to extract insightful features via transfer learning, where convolution combined with pooling was utilized as a feature extractor. For feature selection, a decision tree-based RFE was designed to recursively eliminate less significant features to improve the model generalization performance for accurate prediction. Here, a decision tree was used as an estimator to select the different features. Finally, a modified MLP classifier was employed to classify binary and multiclass types of osteosarcoma under the five-fold CV to assess the robustness of our proposed hybrid model. Moreover, the feature selection criteria were analyzed to select the optimal one based on their execution time and accuracy. The proposed model achieved an accuracy of 95.2% for multiclass classification and 99.4% for binary classification. Experimental findings indicate that our proposed model significantly outperforms existing methods; therefore, this model could be applicable to support doctors in osteosarcoma diagnosis in clinics. In addition, our proposed model is integrated into a web application using the FastAPI web framework to provide a real-time prediction.

#### https://www.mdpi.com/2075-4418/13/12/2106

## Detection of Different Stages of Alzheimer's Disease Using CNN Classifier

#### PROF. DR. DIP NANDI et el.

Alzheimer's disease (AD) is a neurodevelopmental impairment that results in a person's behavior, thinking, and memory loss. The most common symptoms of AD are losing memory and early aging. In addition to these, there are several serious impacts of AD. However, the impact of AD can be mitigated by early-stage detection though it cannot be cured permanently. Early-stage detection is the most challenging task for controlling and mitigating the impact of AD. The study proposes a predictive model to detect AD in the initial phase based on

machine learning and a deep learning approach to address the issue. To build a predictive model, open-source data was collected where five stages of images of AD were available as Cognitive Normal (CN), Early Mild Cognitive Impairment (EMCI), Mild Cognitive Impairment (MCI), Late Mild Cognitive Impairment (LMCI), and AD. Every stage of AD is considered as a class, and then the dataset was divided into three parts binary class, three class, and five class. In this research, we applied different preprocessing steps with augmentation techniques to efficiently identify AD. It integrates a random oversampling technique to handle the imbalance problem from target classes, mitigating the model overfitting and biases. Then three machine learning classifiers, such as random forest (RF), K-Nearest neighbor (KNN), and support vector machine (SVM), and two deep learning methods, such as convolutional neuronal network (CNN) and artificial neural network (ANN) were applied on these datasets. After analyzing the performance of the used models and the datasets, it is found that CNN with binary class outperformed 88.20% accuracy. The result of the study indicates that the model is highly potential to detect AD in the initial phase.

#### https://cdn.techscience.cn/files/cmc/2023/TSP\_CMC-76-3/TSP\_CMC\_39020/TSP\_CMC\_39020.pdf

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

ASHIK MANNAN VASKOR et el.

Urban migration is becoming an increasing issue in the cities in Bangladesh. Since the migrants are mostly poverty affected, they have no other opportunity than to move to urban slums, where, there is no decent infrastructure. The high density of built-forms and lack of understanding about ventilation strategies and thermal insulation are some of the reasons for their sufferings during the summer and winter months. The constant need for health treatment, infrastructure repairing, increasing utility bills due to lack of daylight and ventilation are affecting their extremely marginal economic condition. This study investigates existing built-forms, socio-economic assets, and living conditions in a particular slum area, located in Dhaka, Bangladesh; and, suggests some adaptive solutions in the form of minor and affordable interventions to upgrade their infrastructure, mostly focusing on the inclusion of daylight and ventilation by retrofitting the existing condition.

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

## Unraveling the Burden of T2D among the Adolescents in Bangladesh: A Statistical Exploration of Prevalence and Influencing Factors

DR. MAHFUZA KHATUN et el.

Unraveling the Burden of T2D among the Adolescents in Bangladesh: A Statistical Exploration of Prevalence and Influencing Factors.

## Remediation of chromium (VI) from contaminated agricultural soil using modified biochars.

#### PROFESSOR DR. MD. FARUQUE HOSSAIN et el.

Chromium (Cr) is a potentially toxic metal occurring in the soil as a result of natural and anthropogenic activities and is mainly found in Cr3+ and Cr6+. The hexavalent chromium has toxic effects on plants, animals, humans and microorganisms depending on exposure level, duration and doses. Biochar is a stable carbon-based material that has been widely documented to immobilize metals in contaminated soils and for soil remediation effectively. The present 90 days incubation study was conducted to investigate the potential use of rice stubble and sawdust-derived modified biochars on Cr6+ remediation and their effects on nutrient availability. Among the treatments, modified rice stubble biochar (RSB-M) contained the highest surface area, pore volume and CEC. The unmodified and modified biochars significantly increased soil pH, EC, CEC, and N, K availability ((p < 0.001)). Statistical analysis showed that modified rice stubble (RSB-M) and sawdust biochars (SDB-M) significantly reduced the Cr6+ with incubation days compared to unmodified biochars, possibly due to the greater porous structure and various functional groups. The submerged incubation condition also greatly impacted Cr6+ reduction since a gradual decrease (up to ~70 mg kg-1 of Cr6+) was observed in control treatments. Therefore, applying modified biochars is imperative to alleviate Cr6+ polluted soils and improve soil fertility.

#### https://doi.org/10.1007/s00267-022-01731-7

## Fractionation and Contamination Assessment of Zn, Cu, Fe, and Mn in the Sundarbans Mangrove Soils of Bangladesh, 31(8),

#### PROFESSOR DR. MD. FARUQUE HOSSAIN et el.

This study was conducted to show the effects of high PAH levels on the external and internal structures as well as the functioning of a Poaceae species – Bermuda grass – during phytoremediation process. Two modalities – Tn: unpolluted planted soil and Tp: polluted planted soil – are applied to the monoculture of Bermuda grass for pollution at 10%, 20%, and 30% (weight/weight) with fuel oil, and co-cropping with Goosegrass in soils polluted at 10%. Morphological results revealed that monoculture is better than co-cropping as the sociability of the two species is negatively affected by PAHs. Contrary to monoculture, in the co-cropping the relative growth rate of Bermuda grass morphological parameters is decreasing over time in Tp. For monoculture, the aboveground plant density of Bermuda grass in Tp is not significantly different to Tn, while its specific root length is higher in Tn than Tp. Anatomical and physiological analyses of Bermuda grass show that PAHs impacted the hydromineral nutrition of this species. In fact, the vascular bundles of the stems and roots of Bermuda grass were less numerous in Tp, and the chlorophyll synthesis was 50% inhibited. Despite the slower physiological processes of Bermuda grass in polluted soils, the phytotoxicity of very high PAH levels is not fatal to this species. Its development and evolution on soils highly polluted with PAHs and its phytoremediation potential (more than 95% for total

petroleum hydrocarbons and up to 100% for chrysene) therefore recognize it as particularly suitable for hydrocarbon phytoremediation, with wide geographical application thanks to its cosmopolitan nature.

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## Reduction of hexavalent chromium from contaminated soil using modified biochars. 5(1), 101.

PROFESSOR DR. MD. FARUQUE HOSSAIN et el.

Chromium (Cr) is one of the most common materials present in soils and has been identified as a priority pollutant. It is found in two oxidation states Cr(III) and Cr(VI) and the former oxidation state is less toxic than Cr(VI). Biochar, a stable carbon based material can be used to ameliorate Cr(VI) toxicity by reducing Cr(VI) to Cr(III). Therefore, an incubation study was conducted to see the effects of different biochars and modified biochars on the remediation of Cr. Two different biochars such as saw dust (SDB) and rice stubble (RSB) were produced in low temperature and slow pyrolysis, and both biochars were modified with 1 M KOH as SDB-M and RSB-M. The physicochemical properties, nutrient contents, and heavy metals of soil and all the biochars were analyzed. The modified and unmodified biochars were applied at a rate of 20 tha-1 (1% w/w) in soil contaminated with 100, 200 and 300 mg kg-1 Cr. To assess the pattern of Cr remediation the incubation study was conducted for 0-, 30-, 60- and 90-days intervals. The Cr(VI) reduction was recorded significantly higher (P<0.001) in the modified biochars compared to the unmodified biochars. Modified rice stubble biochar showed the highest Cr(VI) reduction among all biochars. However, this study underpins strong potential of modified biochars in in-situ Cr(VI) remediation from contaminated soils and to be used for environmental management as it has been accepted as a sustainable approach and a promising way to improve soil health and remove inorganic pollutants not only Cr from the soils.

https://www.scholarena.com/article/Reduction-of-Hexavalent-Chromium.pdf

## Unraveling the Burden of T2D among the Adolescents in Bangladesh: A Statistical Exploration of Prevalence and Influencing Factors

DR. M. MOSTAFIZUR RAHMAN et el.

This study aims to investigate the prevalence and determining factors of Type 2 Diabetes (T2D) among youths in Bangladesh using a statistical approach. The research objectives were to determine the prevalence of T2D in this population and identify the factors associated with its occurrence. A survey questionnaire was formed encompassing certain relevant variables. A sample of youths was selected through cluster sampling strategy. By collecting relevant data and employing appropriate statistical analyses, the study provided insights into the prevalence and associated factors of T2D

among the youths, which can contribute to the development of effective prevention and management strategies. Statistical analyses were performed using chi-square tests and logistic regression, to explore the relationships between T2D prevalence and the determining factors identified in the study. Lifestyle factors played a significant role in the development of T2D among youths. Besides, certain socio-demographic factors like occupation, education, income, age, marital status, and residential origin were found to be associated with an increased risk of T2D among youths in Bangladesh. These findings highlight the multifactorial nature of T2D among youths in Bangladesh. Addressing these factors through targeted interventions and public health policies can play a crucial role in preventing and managing T2D in this population. The study emphasized the importance of health awareness and education programs targeting youths in Bangladesh. The findings from this study can contribute to the development of evidence-based strategies to prevent and manage T2D in this population, ultimately reducing the burden of T2D in Bangladesh

#### https://ajse.aiub.edu/index.php/ajse/article/view/786

## Unraveling the Burden of T2D among the Adolescents in Bangladesh: A Statistical Exploration of Prevalence and Influencing Factors

### MD. MORTUZA AHMMED et el.

This study aims to investigate the prevalence and determining factors of Type 2 Diabetes (T2D) among youths in Bangladesh using a statistical approach. The research objectives were to determine the prevalence of T2D in this population and identify the factors associated with its occurrence. A survey questionnaire was formed encompassing certain relevant variables. A sample of youths was selected through cluster sampling strategy. By collecting relevant data and employing appropriate statistical analyses, the study provided insights into the prevalence and associated factors of T2D among the youths, which can contribute to the development of effective prevention and management strategies. Statistical analyses were performed using chi-square tests and logistic regression, to explore the relationships between T2D prevalence and the determining factors identified in the study. Lifestyle factors played a significant role in the development of T2D among youths. Besides, certain socio-demographic factors like occupation, education, income, age, marital status, and residential origin were found to be associated with an increased risk of T2D among youths in Bangladesh. These findings highlight the multifactorial nature of T2D among youths in Bangladesh. Addressing these factors through targeted interventions and public health policies can play a crucial role in preventing and managing T2D in this population. The study emphasized the importance of health awareness and education programs targeting youths in Bangladesh. The findings from this study can contribute to the development of evidence-based strategies to prevent and manage T2D in this population, ultimately reducing the burden of T2D in Bangladesh

## Distributed Ledger Technology Based Integrated Healthcare Solution for Bangladesh

MD. AL-AMIN et el.

Healthcare data is highly sensitive and must be safeguarded. Personal and sensitive data, such as names and addresses, is stored in Encrypted Electronic Health Records (EHRs). This paper proposes a Blockchain-based distributed application platform for Bangladesh's public and private healthcare service providers. The proposed application framework enables users to create secure digital agreements for commerce or collaboration by leveraging data immutability and smart contracts. As a result, all stakeholders can collaborate securely over the same Blockchain network, taking advantage of their data's openness and read/write nature. The proposed application is made up of various application interfaces for various stakeholders. The proposed solution employs Hyperledger Fabric and Blockchain to ensure data integrity, privacy, permissions, and service availability. In the application portal, each user has a profile. The creation of a unique identity for each user, as well as the establishment of digital information centers across the country, has greatly aided the process. This application collects health data from each user in a systematic manner, which is useful for research institutes and healthcare-related organizations. For this application, a national data warehouse in Bangladesh is feasible, and various healthcare-related analyses can be performed using the collected data, assisting the strategy and planning department in making informed decisions regarding the healthcare sector in Bangladesh. Because Bangladesh has both public and private healthcare providers, a simple digital strategy is essential for all organizations to accomplish their services. This study proposes a solution to achieve this goal.

## Proximate Composition and Mineral Content of Three Wild and Cultured Fish Species of Bangladesh

#### DR. FARZANA KHALIL et el.

The proximate composition and selected mineral content of three wild and cultured fishes (Labeo rohita, Mystus cavasius, and Heteropneustes fossilis) were analysed. The protein, lipid, moisture, ash and four minerals such as Ca, P, Fe and Mg from the flesh of wild and cultured fish of each species were estimated. Standard methods were used for analysis. The moisture, ash, protein and lipid content ranged between 75.98 to 78.32%, 2.21 to 3.10 %, 17.11 to 18.20% and 0.65 to 5.37% respectively in wild fishes while 74.05 to 78.05%, 2.10 to 2.63%, 18.20 to19.45% and 0.91 to 5.98% respectively in cultured fishes. Ca, P, Fe and Mg ranged from 463.04 to 950.00, 177.30 to 436.00, 12.66 to 15.30 and 155.00 to 1282.08 mg/kg respectively in wild fishes while 442.87 to 932.34, 182.24 to 432.00, 11.78 to 19.84 and 158.00 to 904.69 mg/kg respectively in cultured fishes. It showed that the cultured fishes are nutritionally superior than the wild fishes considering the protein and lipid content but the wild fishes contained higher mineral contents than the cultured samples.

https://r.search.yahoo.com/\_ylt=AwrOsLjyBqtkrqIaMOVXNyoA;\_ylu=Y29sbwNncTEEcG9zAzEEdnRp ZANBREVOR1QyXzEEc2VjA3Ny/RV=2/RE=1688958835/RO=10/RU=https%3a%2f%2fwww.researc hgate.net%2fpublication%2f369038552\_PROXIMATE\_COMPOSITION\_AND\_MINERAL\_CONTENT\_O F\_THREE\_WILD

# Exploring a Novel Machine Learning Approach for Evaluating Parkinson's Disease, Duration, and Vitamin D Level

### DR. MD. ASRAF ALI et el.

Abstract: Parkinson's disease is an increasingly prevalent, degenerative neurological condition predominantly afflicting individuals aged 50 and older. As global life expectancy continues to rise, the imperative for a deeper comprehension of factors influencing the course and intensity of PD becomes more pronounced. This investigation delves into these facets, scrutinizing various parameters including patient medical history, dietary practices, and vitamin D levels. A dataset comprising 50 PD patients and 50 healthy controls, sourced from Dhaka Medical Institute, serves as the foundation for this study. Machine learning techniques, notably the Modified Random Forest Classifier (MRFC), are harnessed to prognosticate both PD severity and duration. Strikingly, the MRFC-based prediction model for PD severity attains an impressive accuracy of 97.14%, while the predictive model for PD duration demonstrates an accuracy of 95.16%. Noteworthy is the observation that vitamin D levels are notably higher in the healthy cohort compared to PD-afflicted individuals, exerting a substantial positive influence on both the severity and duration predictions, surpassing the influence of other measured parameters. This inquiry underscores the practicality of machine learning in forecasting PD progression and duration and underscores the pivotal role of vitamin D levels as a predictive factor. These discoveries provide invaluable insights into advancing our comprehension and management of PD in an aging population.

10.14569/IJACSA.2023.0141265

## Detection of Different Stages of Alzheimer's Disease Using CNN Classifier

### DR. S. M. HASAN MAHMUD et el.

Alzheimer's disease (AD) is a neurodevelopmental impairment that results in a person's behavior, thinking, and memory loss. The most common symptoms of AD are losing memory and early aging. In addition to these, there are several serious impacts of AD. However, the impact of AD can be mitigated by early-stage detection though it cannot be cured permanently. Early-stage detection is the most challenging task for controlling and mitigating the impact of AD. The study proposes a predictive model to detect AD in the initial phase based on machine learning and a deep learning approach to address the issue. To build a predictive model, open-source data was collected where five stages of images of AD were available as Cognitive Normal (CN), Early Mild Cognitive Impairment (EMCI), Mild Cognitive Impairment (MCI), Late Mild Cognitive Impairment (LMCI), and AD. Every stage of AD is considered as a class, and then the dataset was divided into three parts binary class, three class, and five class. In this research, we applied different preprocessing steps with augmentation techniques to efficiently identify AD. It integrates a random oversampling technique to handle the imbalance problem from target classes, mitigating the model overfitting and biases. Then three machine learning classifiers, such as random forest (RF), K-Nearest neighbor (KNN), and support

vector machine (SVM), and two deep learning methods, such as convolutional neuronal network (CNN) and artificial neural network (ANN) were applied on these datasets. After analyzing the performance of the used models and the datasets, it is found that CNN with binary class outperformed 88.20% accuracy. The result of the study indicates that the model is highly potential to detect AD in the initial phase.

#### https://www.techscience.com/cmc/v76n3/54339

## Exposure and health risks of metals in imported and local brands' lipsticks and eye pencils from Bangladesh

#### DR. MOHAMMAD ANISUR RAHMAN JAMIL et el.

Elemental contamination in cosmetics is a serious health concern as it can pose a cumulative effect on the user's body over a long period. The prime motive of the study was to assess the concentration of 10 concerning chemical elements (Pb, Cd, Cr, As, Co, Ni, Cu, Zn, Fe, and Mn) in imported and local lipsticks and eye pencil samples collected from retail outlets in central Bangladesh (Dhaka city) and to assess their dynamic health risks for users. A total of 18 lipsticks and 24 eye pencils were studied concentrations of chemical elements were examined with atomic and absorption spectrophotometer. The health risk assessment was performed for dermal and ingestion routes of the contaminants. The results reveal that the concentrations of the examined elements vary with colors, brands, and origins. Pb and As concentrations were found below the permissible limit but Cr concentration in some samples exceeded the allowable limit in cosmetics. Cd was not detected in any samples; however, other examined elements such as Co, Ni, Cu, Mn, Zn, and Fe were detected in considerable concentrations. Elements like Mn, Zn, and Fe were found at high levels. In the case of lipstick samples, elemental concentrations followed the order of Fe > Zn > Mn > Ni > Cr > Cu > Pb > Co > As,while the order was Fe > Cu > Mn > Zn > Ni > Cr > Co > Pb > As for eye pencil samples. Results of the hazards quotient(HQ) indicate that there were no non-carcinogenic or carcinogenic risks of elements in samples for dermal exposure. But the cancer risk values of Cr (HQ > 1 for ingestion) in brown color lipsticks and Ni indicate that lipsticks have some carcinogenic effects if they enter the user's body. Dermal cancer risk for eye pencils has also been calculated and for Pb, Cr, Ni, and As; the values were found within the acceptable ranges of 10–6–10–4. It is suggested that the allowable limit of all toxic elements in cosmetics must be established. Furthermore, continuous monitoring is urgently needed for personal care products like lipsticks and eye pencils commonly available in the local markets in the country like Bangladesh.

https://link.springer.com/article/10.1007/s11356-023-25416-8#citeas

## An Enhanced Ensemble Deep Neural Network Approach for Elderly Fall Detection System Based on Wearable Sensors

DR. MUHAMMAD FIROZ MRIDHA et el.

Fatal injuries and hospitalizations caused by accidental falls are significant problems among the elderly. Detecting falls in real-time is challenging, as many falls occur in a short period. Developing an automated monitoring system that can predict falls before they happen, provide safeguards during the fall, and issue remote notifications after the fall is essential to improving the level of care for the elderly. This study proposed a concept for a wearable monitoring framework that aims to anticipate falls during their beginning and descent, activating a safety mechanism to minimize fallrelated injuries and issuing a remote notification after the body impacts the ground. However, the demonstration of this concept in the study involved the offline analysis of an ensemble deep neural network architecture based on a Convolutional Neural Network (CNN) and a Recurrent Neural Network (RNN) and existing data. It is important to note that this study did not involve the implementation of hardware or other elements beyond the developed algorithm. The proposed approach utilized CNN for robust feature extraction from accelerometer and gyroscope data and RNN to model the temporal dynamics of the falling process. A distinct class-based ensemble architecture was developed, where each ensemble model identified a specific class. The proposed approach was evaluated on the annotated SisFall dataset and achieved a mean accuracy of 95%, 96%, and 98% for Non-Fall, Pre-Fall, and Fall detection events, respectively, outperforming state-ofthe-art fall detection methods. The overall evaluation demonstrated the effectiveness of the developed deep learning architecture. This wearable monitoring system will prevent injuries and improve the quality of life of elderly individuals.

## GLD-Det: Guava Leaf Disease Detection in Real-Time Using Lightweight Deep Learning Approach Based on MobileNet

#### DR. MUHAMMAD FIROZ MRIDHA et el.

The guava plant is widely cultivated in various regions of the Sub-Continent and Asian countries, including Bangladesh, due to its adaptability to different soil conditions and climate environments. The fruit plays a crucial role in providing food security and nutrition for the human body. However, guava plants are susceptible to various infectious leaf diseases, leading to significant crop losses. To address this issue, several heavyweight deep learning models have been developed in precision agriculture. This research proposes a transfer learning-based model named GLD-Det, which is designed to be both lightweight and robust, enabling real-time detection of guava leaf disease using two benchmark datasets. GLD-Det is a modified version of MobileNet, featuring additional components with two pooling layers such as max and global average, three batch normalisation layers, three dropout layers, ReLU as an activation function with four dense layers, and SoftMax as a classification layer with the last lighter dense layer. The proposed GLD-Det model outperforms all existing models with impressive accuracy, precision, recall, and AUC score with values of 0.98, 0.98, 0.97, and 0.99 on one dataset, and with values of 0.97, 0.97, 0.96, and 0.99 for the other dataset, respectively. Furthermore, to enhance trust and transparency, the proposed model has been explained using the Grad-CAM technique, a class-discriminative localisation approach.

https://www.mdpi.com/2073-4395/13/9/2240

## Addressing Uncertainty in Imbalanced Histopathology Image Classification of HER2 Breast Cancer: An interpretable Ensemble Approach with Threshold Filtered Single Instance Evaluation (SIE)

### DR. MUHAMMAD FIROZ MRIDHA et el.

Breast Cancer (BC) is among women's most lethal health concerns. Early diagnosis can alleviate the mortality rate by helping patients make efficient treatment decisions. Human Epidermal Growth Factor Receptor (HER2) has become one the most lethal subtype of BC. According to the College of American Pathologists/American Society of Clinical Oncology (CAP/ASCO), the severity level of HER2 expression can be classified between 0 and 3+ range. HER2 can be detected effectively from immunohistochemical (IHC) and, hematoxylin & eosin (HE) images of different classes such as 0, 1+, 2+, and 3+. An ensemble approach integrated with threshold filtered single instance evaluation (SIE) technique has been proposed in this study to diagnose BC from the multi-categorical expression of HER2 subtypes. Initially, DenseNet201 and Xception have been ensembled into a single classifier as feature extractors with an effective combination of global average pooling, dropout layer, dense layer with a swish activation function, and l2 regularizer, batch normalization, etc. After that, extracted features has been processed through single instance evaluation (SIE) to determine different confidence levels and adjust decision boundary among the imbalanced classes. This study has been conducted on the BC immunohistochemical (BCI) dataset, which is classified by pathologists into four stages of HER2 BC. This proposed approach known as DenseNet201-Xception-SIE with a threshold value of 0.7 surpassed all other existing state-of-art models with an accuracy of 97.12%, precision of 97.15%, and recall of 97.68% on H&E data and, accuracy of 97.56%, precision of 97.57%, and recall of 98.00% on IHC data respectively, maintaining momentous improvement. Finally, Grad-CAM and Guided Grad-CAM have been employed in this study to interpret, how TL-based model works on the histopathology dataset and make decisions from the data.

#### https://ieeexplore.ieee.org/document/10296922

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

#### DR. MUHAMMAD FIROZ MRIDHA 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.

## DeepPoly: Deep Learning based Polyps Segmentation and Classification for Autonomous Colonoscopy Examination

#### MD. MAHMUDUR RAHMAN et el.

Colorectal cancer (CRC) is the third most common cause of cancer-related deaths in the United States and is anticipated to cause another 52,580 deaths in 2023. The standard medical procedure for screening and treating colorectal disease is a colonoscopy. By effectively examining the colonoscopy to identify precancerous polyps early and remove them before they become cancerous, CRC mortality can be lowered significantly. Manual colonoscopy examination for precancerous polyps detection is time-consuming, tedious, and prone to human error. Automatic segmentation and analysis could be fast and practical; however, existing automated methods fail to attain adequate accuracy in polyps segmentation. Moreover, these methods do not assess the risk of detected polyps. In this paper, we proposed an autonomous CRC screening method to detect polyps and assess their potential threats. The proposed method utilized DoubleU-Net for polyps segmentation and Vision Transformer (ViT) for classifying them based on their risks. The proposed method has achieved a mean dice-coefficient of 0.834 and 0.956 in segmentation for the Endotech challenge and Kvasir-SEG dataset, accordingly outperforming the existing state-of-the-art polyps segmentation. Then, this method classified the segmented polyps as hyper-plastic or adenomatous with 99% test accuracy.

## A Non-invasive Methods for Neonatal Jaundice Detection and Monitoring to Assess Bilirubin Level: A Review

#### DR. RAZUAN KARIM et el.

Neonatal jaundice is a frequent cause of substantial illness and mortality in newborns. The newborn infant's skin, eyes, and other tissues turn yellow because bilirubin contains a pigment or coloring. Jaundice that manifests in the first few days is highly dangerous and typically needs to be treated right away. It is typically "physiologic" when jaundice emerges on the second or third day. Hyperbilirubinemia refers to an abnormally high bilirubin level in the blood. During the decomposition of red blood cells, bilirubin is formed. Bilirubin can build up in the blood, bodily fluids, and other tissues of newborn babies because they are not naturally able to expel it. Kernicterus or irreversible brain damage can result from untreated jaundice if the abnormally high levels of bilirubin are not controlled. In cases of neonatal jaundice, there is currently a variety of estimating methods for measuring bilirubin levels. The goal of this research is to provide a thorough evaluation of various

non-invasive frameworks for the identification of newborn jaundice. For this review article, a critical analysis has done by using 51 articles from 2009 to 2022 where all articles are based on the detection of neonatal jaundice. This literary work on non-invasive methods and neonatal jaundice results appear to be an understanding of the avant-garde procedures created and used in this domain. The review also compares and contrasts different non-invasive strategies for predicting an infant's state of serum bilirubin based on different data such as social media data, and clinical data. At last, the open issues and future challenges of using a non-invasive method to better understand as well as diagnose the neonatal jaundice state of any individual were discussed. From the literature study, usually apparent that the utilization of non-invasive methods in neonatal jaundice has yielded noteworthy fulfillment within the regions of diagnosis, support, research, and clinical governance.

#### https://aetic.theiaer.org/archive/v7/v7n1/p2.html

## A stacked ensemble machine learning approach for the prediction of diabetes

MD. REAZUL ISLAM et el.

Diabetes has become a leading cause of mortality in both developed and developing countries, impacting a growing number of individuals worldwide. As the prevalence of the disease continues to rise, researchers have diligently worked towards developing accurate diabetes prediction models. The primary aim of this study is to utilize a diverse set of machine learning algorithms to detect the presence of diabetes, particularly in females, at an early stage. By leveraging these methods, this research seeks to provide physicians with valuable tools to identify the disease early, enabling timely interventions and improving patient outcomes. In this study, some state-of-the-art machine learning techniques, such as random forest classifiers with gridsearchCV, XGBoost, NGBoost, Bagging, LightGBM, and AdaBoost classifiers, were employed. These models were chosen as the base layer of our proposed stacked ensemble model because of their high accuracy. Before feeding the data into the models, the dataset was preprocessed to ensure optimal performance and obtain improved results. The accuracy achieved in this study was 92.91%, which demonstrates its competitiveness with the existing approaches. Moreover, the utilization of the Shapley additive explanation (SHAP) facilitated the interpretation of machine learning models. We anticipate that these findings will be beneficial to healthcare providers, stakeholders, students, and researchers involved in diabetes prediction research and development.

https://link.springer.com/article/10.1007/s40200-023-01321-2

## Deep Learning-Based IoT System for Remote Monitoring and Early Detection of Health Issues in Real-Time

MD. REAZUL ISLAM et el.

With an aging population and increased chronic diseases, remote health monitoring has become critical to improving patient care and reducing healthcare costs. The Internet of Things (IoT) has

recently drawn much interest as a potential remote health monitoring remedy. IoT-based systems can gather and analyze a wide range of physiological data, including blood oxygen levels, heart rates, body temperatures, and ECG signals, and then provide real-time feedback to medical professionals so they may take appropriate action. This paper proposes an IoT-based system for remote monitoring and early detection of health problems in home clinical settings. The system comprises three sensor types: MAX30100 for measuring blood oxygen level and heart rate; AD8232 ECG sensor module for ECG signal data; and MLX90614 non-contact infrared sensor for body temperature. The collected data is transmitted to a server using the MQTT protocol. A pre-trained deep learning model based on a convolutional neural network with an attention layer is used on the server to classify potential diseases. The system can detect five different categories of heartbeats: Normal Beat, Supraventricular premature beat, Premature ventricular contraction, Fusion of ventricular, and Unclassifiable beat from ECG sensor data and fever or non-fever from body temperature. Furthermore, the system provides a report on the patient's heart rate and oxygen level, indicating whether they are within normal ranges or not. The system automatically connects the user to the nearest doctor for further diagnosis if any critical abnormalities are detected.

#### https://www.mdpi.com/1424-8220/23/11/5204

## GLD-Det: Guava Leaf Disease Detection in Real-Time Using Lightweight Deep Learning Approach Based on MobileNet

#### MD. RIFAT et el.

The guava plant is widely cultivated in various regions of the Sub-Continent and Asian countries, including Bangladesh, due to its adaptability to different soil conditions and climate environments. The fruit plays a crucial role in providing food security and nutrition for the human body. However, guava plants are susceptible to various infectious leaf diseases, leading to significant crop losses. To address this issue, several heavyweight deep learning models have been developed in precision agriculture. This research proposes a transfer learning-based model named GLD-Det, which is designed to be both lightweight and robust, enabling real-time detection of guava leaf disease using two benchmark datasets. GLD-Det is a modified version of MobileNet, featuring additional components with two pooling layers such as max and global average, three batch normalisation layers, three dropout layers, ReLU as an activation function with four dense layers, and SoftMax as a classification layer with the last lighter dense layer. The proposed GLD-Det model outperforms all existing models with impressive accuracy, precision, recall, and AUC score with values of 0.98, 0.97, and 0.99 on one dataset, and with values of 0.97, 0.97, 0.96, and 0.99 for the other dataset, respectively. Furthermore, to enhance trust and transparency, the proposed model has been explained using the Grad-CAM technique, a class-discriminative localisation approach.

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# Thalassemia carrier status and groundwater iron: Implication for iron supplementation program for children in Bangladesh.

### DR. SABUKTAGIN RAHMAN et el.

Background: Thalassemia, a congenital disorder of hemoglobin synthesis is characterized by low hemoglobin and high iron status, is prevalent in Bangladesh. Iron, consumed through drinking groundwater also increases the population iron status in Bangladesh. The study examined the effect of iron containing micronutrient powder (MNP) on the hemoglobin and ferritin status in Bangladeshi children with thalassemia and their non-thalassemia peers exposed to a high concentration of iron from drinking groundwater.

Design and methods: Three hundred twenty-seven children aged 2-5 years were recruited for an MNP efficacy trial. A sub sample (n = 222) were screened for thalassemia. Hemoglobin and ferritin levels were measured in children with and without thalassemia. Intake of iron from the key sources-diet, groundwater and MNP was measured. Mann Whitney and t-test were employed to compare the groups.

Results: Hemoglobin concentration of the children with thalassemia at the endpoint remained unchanged relative to the baseline;  $11.56 \pm 0.59$  g/dL (Endpoint) versus  $11.6 \pm 0.54$  g/dL (Baseline), p = 0.83. In children without thalassemia hemoglobin tended to increase;  $12.54 \pm 0.72$  g/dL (Endpoint) versus  $12.41 \pm 0.72$  g/dL (baseline), p = 0.06. Baseline reserve of body iron was significantly (p = 0.03) higher in thalassemia carriers (594 gm) compared to their non-carrier peers (558 gm). The increase of the infection-adjusted ferritin from baseline to the endpoint was 7.37% (p = 0.7) and 10.17% (p = 0.009) in the carrier and non-carrier groups respectively.

Conclusions: In Bangladesh, the coexistence of thalassemia and the exposure to a high concentration of iron from drinking groundwater renders anemia prevention program with a low iron MNP potentially lesser hazardous to the thalassemia carriers.

## Behind the scene of the prevalence of anaemia: an extended way of reporting

#### DR. SABUKTAGIN RAHMAN et el.

Objective: To develop the methods for an extended reporting of anaemia and to measure the status of the key contextual underlying factors of anaemia. Design: Statistical appraisal of Hb v. key influencers of anaemia in Bangladesh – the intake of animal source food (ASF), concentration of Fe in the drinking groundwater (GWI) and the prevalence of congenital Hb disorder (CH) are conducted. The primary data of the National Micronutrient Survey 2011–2012 and the British Geological Survey 2001 are analysed to assess the intake of ASF and the GWI concentration, respectively. The prevalence of thalassaemia from a national survey is used to appraise the CH. ASF is evaluated relative to the 97.5th percentile intake and group scores are assigned. Association of the GWI and Hb is examined by the linear fit and the mspline fit and the group scores are allocated. Group score is

allocated for the prevalence of thalassaemia. Inflammation-adjusted ferritin is considered to report Hb. Setting: A nationwide survey in Bangladesh. Participants: Preschool children (6–59 months), school-age children (6–14 years) and non-pregnant non-lactating women (NPNLW, 15–49 years). Results: The extended reporting to the prevalence of anaemia in Bangladeshi preschool children, school children and women is – anaemia 33 % (ASF: 2·08; GWI: 1·75; CH: 2), anaemia 19 % (ASF: 1·98; GWI: 1·56; CH: 2) and anaemia 26 % (ASF: 2·16; GWI: 1·58; CH: 2), respectively. Conclusion: The extended reporting of anaemia is a useful tool to understand the status of the key influencers of anaemia, to design the context-customised intervention and to monitor the intervention.

## 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

## Early initiation of breastfeeding and its determinants of mothers in Rajshahi district, Bangladesh: A cross-sectional study

### DR. UMMAY AYESHA et el.

Early initiation of breastfeeding (EIBF) provides the first immunization for the newborns. This study aimed to identify the factors associated with EIBF among mothers in Rajshahi district, Bangladesh. A number of 421 mothers living in Rajshahi district who had at least one infant aged 6-24 months were considered as sample. Mothers were selected using multistage random sampling. This study was conducted from January 1 to March 31, 2019. The prevalence of EIBF among mothers in Rajshahi district was 88.4%. Eight factors associated with EIBF: (i) husbands' education level, (ii) husbands' occupation, (iii) monthly family income, (iv) mothers' age, (v) mothers' BMI, (vi) place of delivery, (vii) planned pregnancy and (viii) mothers taking advice regarding the benefit of breastfeeding during their pregnancy. This study identified several factors associated with EIBF. These factors could be considered to increase the rate of EIBF among mothers in Bangladesh.

Keywords: Bangladesh; Breastfeeding; Early initiation; Newborn; Prevalence

http://www.humanbiologyjournal.com/article/early-initiation-of-breastfeeding-and-itsdeterminants-of-mothers-in-rajshahi-district-bangladesh-a-cross-sectional-study/

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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.

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

## Biodegradable Personal Protective Equipment (PPE) from Poly(vinyl alchohol)/Chitosan Blended Bio-Polymers

#### DR. MOHAMMAD TARIQUL ISLAM et el.

The current PPE in use is made of plastic of plastic derivatives that are either single use or reusable after proper disinfection or sterilization. The gowns are accompanied by a head covering that is either attached or detached. Similar standards apply for medical gloves and they are always disposable after single use. We are proposing that the medical protective equipment such as gowns, head covers and gloves are made from very common and prospective bio-polymer Poly (vinyl alcohol) (PVA) and Chitosan.