MIST Newsletter

MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY

Technology for Advancement

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COMMANDANT'S MESSAGE



Greeting to all members of MIST. Within a span of two decades, MIST is now one of the leading Engineering Institutes of Bangladesh. MIST, with its continuous efforts is providing quality education in the field of science, engineering, technology and is conducting research to meet the national and global challenges. Despite the pandemic situation, MIST continued academic activities maintaining social distancing and other corona protocols strictly. This newsletter reflects notable events of last six months. I express my heartfelt thanks and gratitude to the editorial board for publishing MIST Newsletter regularly.

MIST TEAM MONGOL BAROTA WINS GLOBAL CHAMPIONSHIP IN UNIVERSITY ROVER CHALLENGE (URC)



MIST TEAM Mongol Barota has topped among all the teams of University Rover Challenge (URC) Virtual Final 2021 with a total score of 180 by attaining a perfect score (100) in Equipment Servicing Mission and 2nd Highest Score (80) in Extreme Retrieval and Delivery Mission. The virtual URC is considered to be one of the most prestigious robotic competition in the world. MIST team proudly raised our flag in the most prestigious robotic competition on earth.

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GOVERNING BODY MEETING OF MIST

The 37th meeting of the **Governing Body of MIST** was held on 20th June 2021 at MIST. Major General Ibne Fazal Shayekhuzzaman, BSP, SGP, afwc, psc, Engineer in Chief, Bangladesh Army presided over the meeting. Commandant MIST, Representative from AFD, Services Headquarters, BUP and other civil officials/Academicians from DU, BUET and different ministries were also present in the meeting.



ACADEMIC COUNCIL OF MIST

The 67th and 68th meetings of the **Academic Council of MIST** were held on 7th March and 9th June, 2021 respectively at MIST. Commandant MIST Major General Md. Wahid-Uz-Zaman, ndc, aowc, psc, te chaired the meeting. Representatives from Ministry of Education, Ministry of Defence, Armed Forces Division and three services Headquarters and representatives of BUET and DU were also present in the meeting.

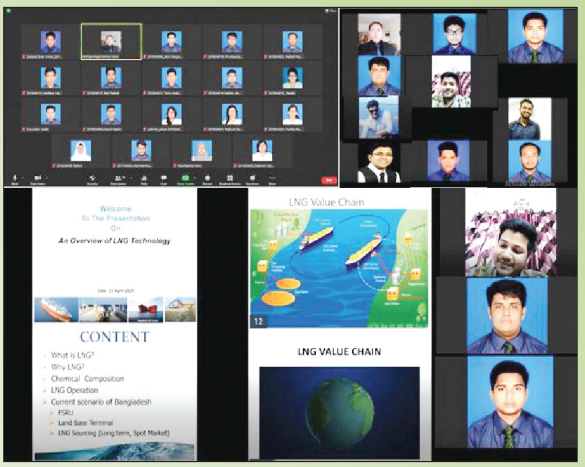
CONTRACT SIGNING CEREMONY

Contract Signing Ceremony Between CATS-MIST (EWCE) and Bangladesh Economic Zones Authority (BEZA) was held on 28th March, 2021 for Environmental Impact Assessment (EIA) Study of Establishing Sonadia Eco-Tourism Park. To access the biodiversity hazards and impact analysis of different development works are the main vision of this project. A multidisciplinary team is assigned by EWCE Department to complete the study successfully.



GUEST LECTURE ON LIQUID NATURAL GAS (LNG) TECHNOLOGY

Department of Petroleum and Mining Engineering (PME) has successfully organized guest lecture on **Liquid Natural Gas (LNG) Technology** on 22nd April, 2021. B.M. Khasbur Rahman, Assistant Engineer, Rupantarita Prakritik Gas Company Limited (RPGCL) has conducted the lecture as a resource person of LNG technology. Students of level 3 and 4 of PME department participated in the guest lecture. Presentor delivered lecture focusing on monitoring feasibility study of Bangabandhu Land Base LNG Terminal, Matarbari, Mosheshkhali, LNG sourcing from spot market and monitoring FSRU & LNG cargo security. In addition, properties of LNG, future prospect of LNG in Bangladesh and establishment of more LNG terminals in Bangladesh also covered in guest lecture. Job prospect of PME graduate engineer in LNG sector has been discussed in the guest lecture.



GUEST LECTURE ON GROUNDWATER MANAGEMENT OF A LONGWALL COAL MINE



An online guest lecture on **Groundwater Management of a Longwall Coal Mine** from Barapukuria Coal Mining Company Limited was arranged by the Department of Petroleum and Mining Engineering on 06th May, 2021. The objective of the lecture was to teach the students about the groundwater management setup of a longwall mine. The students had an idea of real-field groundwater management issues and the management system.

WEBINAR ON INDUSTRIAL AUTOMATION IN THE ERA OF INDUSTRY 4.0

A webinar title **Industrial Automation in the Era of Industry 4.0** was arranged by IPE Department of MIST on 12th June 2021. Eighty students from different levels attended that webinar. Mr. Faisal Shahed project manager, Phoenix Contact E- Mobility, Schieder- Schwalenberg, Germany was The key speaker present in that webinar. The speaker conducted an insightful lecture on Industrial Automation, Smart Technologies and Overview of Industry4.0.



SHORT COURSE ON SHIP DESIGN SOFTWARE (MAXSURF & RHINO)

A short course titled **Short Course on Ship Design Software (MAXSURF & Rhino**) was organized from 28th February 2021 to 11st March, 2021 by the Department of Naval Architecture and Marine Engineering (NAME). This course was designed to perform ship design projects as well as professional practice in this field of engineering. A total of 35 participants including students of MIST and professionals from ship building industry participated in the course.



DEVELOPMENT WORKS OF SHEIKH HASINA CANTONMENT, LEBUKHALI





EWCE Department of MIST has been involved with various development works of Sheikh Hasina Cantonment, Lebukhali. Fesibility Study, River bank protection work, Dyke construction supervision, Drainage system development etc are some of them. Recently River Bank Protection and maintenance work along Island-6 of Sheikh Hasina Cantonment has been supervised by EWCE Department from January to March 2021.

ACTIVITIES OF EECE DEPARTMENT









On 27th March 2021, a webinar on **Research Paper Writing** was arranged by IEEE MIST Student Branch (SB) and conducted by Bishwamittra Ghosh, PhD Student, Computer Science Department, School of Computing, National University of Singapore to guide and motivate young minds for research-based works and their documentation in terms of research papers.

A workshop named **Machine Learning: The Beginning on Introduction to Machine Learning** was held on 24th May, 2021.

On 28th May, 2021 **IEEE MIST SB Membership Drive 2021** was arranged online where, Brigadier General A K M Nazrul Islam, PhD, Head, department of EECE, Professor Mohammed Hossam-E-Haider, PhD, Group Captain Md Abdul Halim, psc, Engg, BAF and Md Samin Rahman, Lecturer (EEE), BSMRAAU placed their valuable insights to motivate new minds to have the same vision as IEEE MIST SB itself.

Workshop on the **Application of Laser Generated Plasma: Superpowers in Reality**, and a webinar on **Job Opportunities in Power Sector of Bangladesh** were arranged on 12th June and 2th July 2021 respectively. This department also arranged a Workshop on **Machine Learning** on 17th June 2021.

On the other hand, **Robotics and project showcasing competitions** are arranged every year by the MIST Robotics Club for the technophiles to explore their creativity in the field of robotics under the supervision of the department of EECE.

On 21st May, 2021 **Tech-Know** an online segment to intrigue young minds towards technology was launched and successfully completed.

On 14th June, 2021 **Tech-Fiesta 1.0** was arranged online to fuel the competitive and creative minds of the young engineers. Inauguration Ceremony for the new members was held on 18th June 2021 with Brigadier General A K M Nazrul Islam, Head, Department of EECE, as the chief guest. The positive energy and enthusiasm of the students made the event a successful one.

ACTIVITIES OF BME DEPARTMENT

UV DISINFECTION CHAMBER PROJECT

Department of Biomedical Engineering developed an UV (Ultra-Violet) disinfection chamber for the disinfection of portable items such as a soldier's cap, money bag, mobile phone, etc. The UVC-type ray is effective to kill virus and bacteria, without the need for any chemicals to come in contact with the materials. The disinfection chamber is suitable for everyday used objects, especially in the COVID-19 pandemic situation.





SANITIZER REFILL STATION PROJECT

In order to prevent and mitigate the spread of COVID-19 in Bangladesh, Department of BME, MIST initialized and still supervising the Hand Sanitizer Production Project in MIST since March 2020. Hand Sanitizer filling is an intricate task. The precise amount must be ensured for every bottle. To facilitate the Hand Sanitizer Production Department of BME, MIST has developed a Sanitizer Refill Station. The station can automatically detect the bottle, and then fill it with the selected amount of liquid. The station has overload protection to prevent bottles from overflowing. It has aided to increase daily production of hand sanitizers with minimal manpower.

HAND SANITIZER STIRRER MACHINE PROJECT

For mass production of any liquid-based product, a stirrer machine is essential to ensure uniform composition of final products. To facilitate the mass production of hand sanitizer under the MIST Hand Sanitizer Production Project an indigenous liquid stirrer machine was developed by Department of Biomedical Engineering, MIST. The machine can mix various chemicals, colors, fragrances, etc., evenly, which helped increase the daily production of hand sanitizers of MIST Hand Sanitizer Production Unit.





AUTOMATIC SANITIZER SPRAYING STATION PROJECT

During the covid-19 outbreak, sanitizer is being used frequently. Maintaining sanitization in public institutions like schools, colleges, mosques, offices, etc., is a complicated task. The personnel designated to ensure sanitization can be subject to exhaustion; and eventually, the entry becomes insecure. Department of Biomedical Engineering developed an automatic sanitizer spraying station to ensure the best use of sanitizer for a mass number of people at the entry points. The station can automatically detect human hands (obstacles) and dispense the sufficient amount of Sanitizer.

OBSERVANCE

BANGABANDHU SHEIKH MUJIB DHAKA MARATHON-2021

MIST organized a special program in observance of the **Bangabandhu Sheikh Mujib Dhaka Marathon-2021** on 03rd February 2021. Maj Gen Md Wahid-Uz-Zaman, ndc, aowc, psc, te, Commandant, MIST attended the program as chief guest. All members of MIST participant in the 5 Kilometer Digital Marathon.



BIRTH CENTENARY OF FATHER OF THE NATION AND NATIONAL CHILDREN DAY



MIST organized a special program in observance of the **101st Birth Anniversary** of Father of the Nation and **National Children Day** on 17th March 2021. In the morning, a rally with festoons and placards was conducted around MIST premises. Discussion on the life and work of Bangabandhu followed by documentary films show were also arranged in the remarkable occasion.

CELEBRATION OF COUNTRY'S GOLDEN JUBILEE OF INDEPENDENCE

EWCE Department had arranged a phenomenal programme on 26th March, 2021 at General Mustafiz Multipurpose Hall auditorium to celebrate 50 years of **Independence of Bangladesh, Our Country's Golden Jubilee**. Respected Commandant of MIST was present there to glorify the event. The year 2021 had also been announced as **'Mujib Borsho'** by the Government of Bangladesh to celebrate the birth centenary of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman. To rejoice this very special and distinctive Independence Day, the historic and glorious events of liberation war, the sacrifices of our forefathers, the eventful life and ideals of Bangabandhu Sheikh Mujibur Rahman were focused in this programme to relish the glory of our nation and ignite patriotism.



ACHIEVEMENT

MEDICAL ROBOTICS COMPETITION FOR CONTAGIOUS DISEASES 2020

A student team of MIST wins £ 5000 GBP championship prize money in a profoundly prestigious global competition on **Medical Robotics for Contagious Diseases Challenge 2020 (Application Category),** sponsored by UK Robotics and Autonomous System (UK-RAS) Network. This multi-round qualifying and highly competitive event was organized by Imperial College of London. Team MIST developed a UVC disinfection robot named 'UVC Purge V.2'. The Online Award Ceremony was held on 04th February, 2021. Other two winners are: Johns Hopkins University, USA in 'Innovation' Category and Leeds University, UK in 'Design' Category.



5th BANGLADESH WOMEN'S MATHEMATICAL OLYMPIAD 2021



Anika Ashraf, a student of Level 3 of the Department of Computer Science and Engineering has secured the first position in the **5th Bangladesh Women's Mathematical Olympiad 2021**. The prestigious event was held on the eve of Women's Day (8th March) and was organized by the Bangladesh Women's Mathematics Olympiad committee, headed by Dr. Chandranath from the Department of Mathematics, University of Dhaka. Department of CSE extends the heartiest congratulations to Anika and wishes her all the best in her future endeavors.

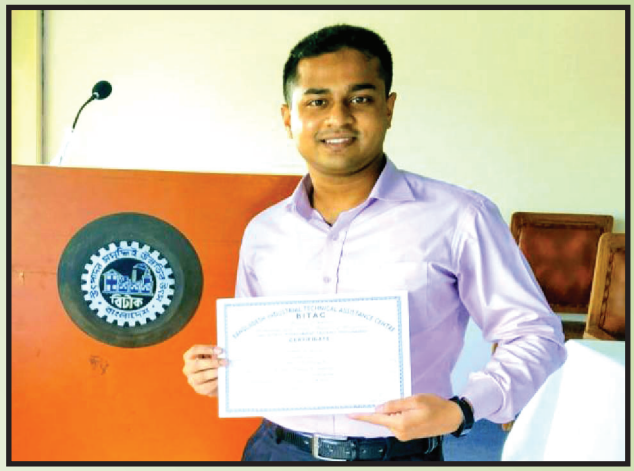
ESSAY COMPETITION ON GOLDEN JUBILEE OF INDEPENDENCE

On 26th March, 2021 Green for Peace CUET organized **An Essay Writing Competition** on occasion of Golden Jubilee of Independence. Lt Md Nazirul Ahsan Eshad, EME level-4 student of ME department, achieved 9th place. Students from 12 different universities along with CUET participated in that competition.



ESSAY COMPETITION ON THE CONTRIBUTION OF BANGABANDHU IN THE FIELD OF INDUSTRY

Bangladesh Industrial and Technical Assistance Center, (BITAC) organized **An Essay Competition** from 23rd February 2021 to 8th March 2021 on the topic **The Contribution of Bangabandhu in the field of Industry of Independent Bangladesh**. Among the students Lt Md Mohaiminul Al Munim, BN secured the 1st position. Moreover Lt Fahim Foysal Arnob, EME secured 2nd place Lt Md Nazirul Ahsan Eshad, EME and Lt Abuhurayra Rifat, BN become 3rd jointly.



PAPER PRESENTATION



A seminar was organized by Dhaka North City Corporation (DNCC) on 14th February 2021 titled 'ভালবাসা দিবস একদিন শহরকে ভালবাসি প্রতিদিন'. Department Head of EWCE-MIST presented a paper on **Present Situation of Waste and Solid Waste Management at Dhaka city and Action Needed in Future to Resolve the Issue**.

THE BIGGEST WIND TUNNEL OF THE COUNTRY IN FLUID MECHANICS LABORATORY

ME Department, MIST always tries to maintain world class standard of its laboratories. Updating the laboratory equipment is a continuous process to maintain this standard. As a part of it, ME Department is establishing one of the biggest wind tunnels of the country in fluid Mechanics laboratory. Construction of this wind tunnel is on the verge of completion. Respected Commandant visited the construction work on 20th June 2021. After completion, this wind tunnel will enhance the research capability of MIST extensively.



ARTICLE PUBLISHED

JOURNALS

- Prof Dr G M Jahid Hasan from CE Department has published a journal paper titled as "A Quantitative Analysis of Shoreline Changes Along the Coast of Bangladesh Using Remote Sensing and GIS Techniques" in Q1 Category Elsevier Journal 'Catena' 201 (2021) 105185, pp 1-11, https://doi.org/10.1016/j.catena.2021.105185, Impact Factor: 4.333.

- Prof Dr G M Jahid Hasan from CE dept has published another journal paper titled as "Bank-line Behaviour of the Main Rivers Located Within Sundarbans Using Digital Shoreline Analysis System" in MIST International Journal of Science and Technology (MIJST), Vol 9(1), 2021, pp 11-21, https://doi.org/10.47981/j.mijst.09(01)2021.288(11-21).

- Lt Col Khondaker Sakil Ahmed, Lec Jesika Rahman (on Leave) and Asst Prof Kamrul Islam (on Leave) of CE Department have published a journal paper titled " Data-driven shear strength prediction of steel fiber reinforced concrete beams using machine learning approach" in Engineering Structures, Vol 233, 2021.

- Lt Col Khondaker Sakil Ahmed and Lec Md Shahjalal of CE Department have published a journal paper titled "Bond strength of post-installed high strength deformed rebar in concrete" in Case Studies in Construction Materials, Vol 15, 2021.

- Lt Col Mohammed Russedul Islam, PhD from CE Department has published a journal paper titled as "Seismic slope failures: a numerical investigation by the smoothed particle hydrodynamics (SPH)" in Innovative Infrastructure Solutions (2021) 6:155, http://doi.org/10.1007/s41062-021-00523-y.

- Lt Col Md Jahidul Islam, PhD, Lec Md Shahjalal, Md. Mehedi Hasan and Zarin Tasnim Chowdhury from CE Department has published a journal paper titled as "Effect of Admixture on Physical and Mechanical Properties of Recycled Brick Aggregate Concrete" MIST International Journal of Science and Technology (MIJST), Vol. 09, June 2021, https://doi.org/10.47981/j.mijst.09(01)2021.287(37-44)

- Islam, M. N. et al. (2021). Developing a Novel Hands-free Interaction Technique based on Nose and Teeth Movements for Using Mobile Devices. IEEE Access, Vol. 9, 2021 IEEE. (IF: 3.745).

- Islam, M. N., Inan, T. T., Rafi, S., Akter, S. S., Sarker, I. H., & Islam, A. K. M. N. (2021). A Systematic Review on the Use of AI and ML for Fighting the COVID-19 Pandemic. IEEE Transactions on Artificial Intelligence, doi: 10.1109/TAI.2021.3062771.

- Zaki, T., & Islam, M. N. (2021). Neurological and physiological measures to evaluate the usability and user-experience (UX) of information systems: A systematic literature review. Computer Science Review, 40, 100375. (IF: 7.707).

- Islam, M. N., Mahmud, T., Khan, N. I., Mustafina, S. N., & Islam, A. N. (2021). Exploring Machine Learning Algorithms to Find the Best Features for Predicting Modes of Childbirth. IEEE Access, Vol. 9, pp. 1680 - 1692, IEEE. (IF: 3.745).

- Akhtaruzzaman, M. (2021) Force-Sensitive Classic Toothbrush: System Analysis, Design, and Simulation. Electrica, 21(2):189-202, https://doi.org/ 10.5152/electrica.2021.21007 (SCOPUS, Web of Science) (IF: 0.90).

- Islam, M.A., Anik, M.S.H. & Islam, A.B.M.A.A. (2021) Towards achieving a delicate blending between rule-based translator and neural machine translator. Neural Comput & Applic. https://doi.org/10.1007/s00521-021-05895-x.

- The paper entitled "Experimental Study of Water Collection from Plume of an Induced-Draft Counter-Flow Cooling Tower Using Space Charge Injection" written by former ME Department students Md. Fahim Faisal Patwary, Isheka Agarwala and Rashik Ahmed was accepted for publication in the June issue of MIJST.

CONFERENCES PAPER

• Lt Col Khondaker Sakil Ahmed, PhD, Lec Samia Zakir Sarothi and Lec Afia Farzana from CE Department have published a conference paper titled "Compressive Strength Evaluation Of Rectangular Hollow Grade-201 Stainless Steel Stub Columns" in 5th International Conference on Advances in Civil Engineering (ICACE), 4-6th March, 2021, CUET, Chattogram, Bangladesh.

• Lt Col Khondaker Sakil Ahmed, PhD and Lec Md Shahjalal from CE Department have published a conference paper titled "Mechanical Characterization of Rubberized Recycled Brick Aggregate Concrete" in The 3rd International Conference on Civil, Materials, and Environmental Engineering (ICCME 2021), 4th-5th April 2021 Kuala Lumpur, Malaysia.

• Lt Col Khondaker Sakil Ahmed, PhD and Lec Afia Farzana from CE Department have published a conference paper titled "Seismic Evaluation Of Stainless Steel Reinforced Concrete Bridge Pier Using Performance-Based Damage States" in 5th International Conference on Advances in Civil Engineering (ICACE), 4th to 6th March, 2021, CUET, Chattogram, Bangladesh.

• Lt Col Mohammed Russedul Islam, PhD and his students from CE Department has published a conference paper titled as "Assessing Bus Service Quality in Dhaka City from the Perspective of Female Passengers" and achieved Best Paper Award in 5th ICACE Conference 4-6 March 2021, CUET.

• Lt Col Md Jahidul Islam, PhD from CE Department has published a conference paper titled as "Effect of fiber type and length on the mechanical properties of recycled aggregate concrete" CSCE 2021 Annual Conference, 26th to 29th May 2021 Canada.

• Lt Col Md Jahidul Islam, PhD from CE Department has published a conference paper titled as "Mechanical and durability properties of fly ash blended concrete with GI fiber" CSCE 2021 Annual Conference, 26th to 29th May 2021, Canada.

• Lt Col Md Jahidul Islam, PhD from CE Department has published a conference paper titled as "Mechanical Behavior of carbon and galvanized iron textile reinforced concrete Advance Materials Web congress, International Association of Advanced Materials (Org. nr. 802503-6784)Gammalkilsvagen 18, Ulrika 59053, Sweden.

•Asst Prof Rishath Sabrin from CE Department has published a conference paper titled as "Influence of Inorganic and Natural Fibers on Low- Strength Concrete Properties" Proceedings of the 5th International Conference on Advances in Civil Engineering (ICACE 2020), CUET, Chattogram-4349, Bangladesh, 4th to 6th March 2021, SE 103-SE 109.

BOOK CHAPTERS

- Jalal M.M., Tasnim Z., Islam M.N. (2021) Exploring the Machine Learning Algorithms to Find the Best Features for Predicting the Risk of Cardiovascular Diseases. In: Vasant P., Zelinka I., Weber GW. (eds) Intelligent Computing and Optimization. ICO 2020. Advances in Intelligent Systems and Computing, vol 1324. Springer, Cham.

- Aishwarja A.I., Eva N.J., Mushtary S., Tasnim Z., Khan N.I., Islam M.N. (2021) Exploring the Machine Learning Algorithms to Find the Best Features for Predicting the Breast Cancer and Its Recurrence. In: Vasant P., Zelinka I., Weber GW. (eds) Intelligent Computing and Optimization. ICO 2020. Advances in Intelligent Systems and Computing, vol 1324. Springer, Cham.

- Islam M.N., Khan S.R., Islam N.N., Rezwan-A-Rownok M., Zaman S.R., Zaman S.R. (2021) A Mobile Application for Mental Health Care During COVID-19 Pandemic: Development and Usability Evaluation with System Usability Scale. In: Suhaili W.S.H., Siau N.Z., Omar S., Phon-Amuaisuk S. (eds) Computational Intelligence in Information Systems. CIIS 2021. Advances in Intelligent Systems and Computing, vol 1321. Springer, Cham. (ISI/SCOPUS Indexed).