MD. ARAFAT JAMIL

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EDUCATION AND CERTIFICATION

March 2020

Khulna University of Engineering & Technology
(KUET) Khulna-9203, Bangladesh
B.Sc. in Building Engineering and Construction Management (BECM)
CGPA: **3.09** (out of 4.00) (3.48 in last semester)

ACADEMIC EMPLOYMENT

Jan 2019 – Feb 2020

Research Assistantships
Under Md. Mehrab Hossain
Department of Building Engineering and Construction Management,
Khulna University of Engineering & Technology (KUET),
Khulna-9203, Bangladesh
Responsibilities: Research work and Project work

Standardized Test Score

TOEFL iBT – 9th August, 2025

Overall	Reading	Listening	Speaking	Writing
90	25	24	20	21

Graduate Record Examination (GRE) – 14th December, 2022

Total	Quantitative	Verbal	Analytical
307	161	146	2.5

AWARDS, GRANTS AND HONORS

National

Awards/Honors	Year
• University Merit Scholarship (8 times)	2017-2020
• Champion in Poster Presentation in BUILTECH FEST 4.0	2018
• Champion in Physics Wiz Challenge in Intra College Annual Sports, Chapainawabgonj, Bangladesh.	2014
• Education Scholarship by Bangladesh Army Welfare Trust	2012-2020

PROFESSIONAL QUALIFICATIONS/MEMBERSHIP

Date	Institute Name	Membership Type
June 2023 - Present	The Institution of Engineers, Bangladesh	Full Member

RESEARCH INTEREST/INVOLVEMENT

- Construction and Project Management; Data-driven Construction; Text Data Analytics; Smart Building; Smart Construction; Contract Management
- IoT in Construction and Project Management
- Construction Innovation and Automation in Construction.
- Quantify the data analysis with a Machine Learning (ML) Approach
- Building Information Modeling (BIM), Green Building
- Deep Learning, Artificial Intelligence, Natural Language Processing (NLP)
- Construction Safety, Risk Management, Building Thermal Comfort
- Infrastructure and Facility Management Systems, Cloud Computing
- Life Cycle Cost Analysis, Asset Management
- Earthquake Engineering, Seismic Hazard Mitigation, Finite Element Modelling, Computational Modelling, Materials Modelling, Performance-Based Design
- Quantify the structural analysis data with a Machine Learning (ML) Approach
- Deep Learning, Artificial Intelligence, Natural Language Processing (NLP)
- Structural Health Monitoring, Disaster Management, Big Data Analytics in SHM, Self-Sensing Materials, Digital Twins in SHM, Internet of Things (IoT) in SHM

LIST OF PUBLICATIONS

Refereed Journals:

1. **Md. Arafat Jamil**, Md. Shah Jamal. Article: *An Analysis for Deconstruction and Demolition of Residential Buildings in Dhaka City*. Accepted for publication at 4th International Conference on Advances in Civil Engineering (ICACE) – December 2018, Chittagong, Bangladesh.

Under Reviewed Journals:

1. *Augmenting Cost-Efficient Construction Safety: A Paradigm Shift Toward a Synergized Technological and Economic Appraisal with Safety Eye Monitoring:* **Md. Arafat Jamil**, S M Asif Anam, Shuvo Dip Datta, Md. Hamidul Islam, Md. Mehrab Hossain, Shakil Ahmed, and Md. Salehin Osmani *(Under Review in Engineering, Construction and Architectural Management)*

2. *Opportunities of AI-Integrated Digital Twin in the Construction Industry:* **Md. Arafat Jamil**, Md. Ramjan Ali, Mohammad Nafe Assafi, Md. Habibur Rahman Sobuz, and Md. Shah Jamal *(Under Review in Heliyon by Cell Press)*

3. *Advancing a BIM-Based Safety Monitoring Framework for Confined Spaces:* S M Asif Anam, Bytullah Emon, **Md. Arafat Jamil**, Md. Ramjan Ali, Mizanoor Rahman, Mohammad Nafe Assafi, *(Under Review in International Journal of Construction Management by Taylor and Francis)*

4. *Streamlining Regulatory Adherence: Developing a BIM-Integrated Building Code Compliance Checker:* **Md. Arafat Jamil**, S M Asif Anam, Md. Ramjan Ali, Md. Abu Safayet, Mohammad Nafe Assafi, *(Under Review in International Journal of Construction Management by Taylor and Francis)*

COMPUTER SKILL:

• Programming Language:	Python, PHP, C++, MATLAB, HTML.
• BIM & Architectural Software:	Autodesk Revit, AutoCAD, Archicad, Sketchup.
• Structural Analysis Software:	ETABS, SAP 2000, SAFE, TEKLA TEDDS, Bently RAM Connection, IDEA StatiCa, Bentley CivilStorm, Autodesk Robot Structural Analysis.
• Construction Management:	Primavera P6, Microsoft Project, Autodesk Design Review, Navisworks.
• Simulation Software:	DIANA FEA, Ansys, Abaqus.
• Microsoft Package:	MS Word, MS PowerPoint, MS Excel, MS Publisher.
• Graphical Package:	Adobe PhotoShop, Adobe Illustrator.
• Operating System:	Linux, Windows.

ACADEMIC CONCEPTUAL PROJECTS

2025 **Machine Learning-Based Structural Health Monitoring for Construction Automation**

- **Description:** This is a research-oriented SHM simulation project that illustrates how signal processing + machine learning can be applied to detect structural damage in real time. It provides a foundation for developing AI-driven SHM systems in construction automation, which can later be extended with real sensor networks, communication delays, energy constraints, and digital twin integration. (Link: https://arafat91112.github.io/Portfolio/#projects)

2025 **Autonomous Drone Swarm Mapping Using Sweep Patterns: Simulation and Performance Metrics**

- **Description:** This project is significant because it demonstrates a controlled yet realistic simulation of swarm robotics for autonomous 3D mapping, complete with visualization, coordination logic, collision handling, and performance metrics. It's a foundation for testing and developing advanced drone swarm navigation algorithms that can be applied in construction, robotics, and disaster response. (Link: https://arafat91112.github.io/Portfolio/#projects)

2023 **Framework Development of BIM-based Automated Building Code Compliance Check**

Key Responsibilities:

- Develop a web framework to read IFC files
- Store the targeted IFC properties of specific objects
- Match the targeted IFC properties of specific objects with the building code requirement to check whether or not they satisfy the code requirements.

2022 **Framework Development of BIM-based Automated Safety Checking In Confined Spaces**

Key Responsibilities:

- Develop a conceptual framework for the sensor circuit diagram
- Develop a micro model to facilitate a real-time testing environment
- Develop a web framework to monitor the data received from the sensors

2019-2020 **Implementation of Structural Health Monitoring Techniques and Learning Building Safety Regulations, KUET**

Key Responsibilities:

- Use of different structural health monitoring tools like rebound

hammer, ultrasonic pulse velocity machine, and rebar scanner
- Identification of an intentional crack on concrete objects using SHM tools and measuring the depth of the crack
- Familiarization with OSHA regulations for the safety of a building

2019-2020 **Use of Building Information Modeling Tools in a G shaped 5 Storied Residential Building Project, KUET (Solo Project)**

Key Responsibilities:
- Implementation of BIM tools like REVIT, ROBOT, Autodesk Navisworks, and Autodesk Design Review in an overall building project life-cycle
- Developed custom-made BIM objects like doors, windows, and other components
- Understanding the IFC file properties

2019 **Analysis and Design of a 10 Storied Residential Building, KUET (Solo Project)**

Key Responsibilities:
- Completion of the structural design of a 10-storied residential building using both manual and software techniques using ETABS
- Compare the resulting lateral force between software-generated results and manual calculation

Research Works Responsibilities:

January 2019 – February 2020

Responsibilities: Responsibilities included research plan and model development, project management, research report preparation, and supervising undergraduate students.

- The study focuses on developing a cloud-based automated construction safety monitoring system.
- An Android application was developed to track the construction personnel.
- A web framework was developed to monitor the construction personnel on a specific construction premise.
- The targeted construction project plan was integrated with the server using BIM tools.
- The site coordinates, and hazard area was defined in the server database and validated using GPS data.
- Results indicated that the system successfully alerted the respected authority and the construction personnel of probable accidents when construction personnel entered a predefined hazard zone.

July 2020 – December 2021

Responsibilities: My responsibility was to develop the hardware setup for the automated real-time fire alert system. I integrated the Building Information Modeling (BIM) with the fire detection

sensors, validated the code to detect fires and send alerts accurately, and ensured that all the hardware components were correctly installed and functioning within the prototype building. Through my work, I successfully implemented the system and verified its effectiveness in real-time fire detection and notification.

- Architectural transformations in Bangladesh, including the rise of high-rise buildings and confined spaces, have introduced greater diversity and unpredictability in fire incidents.
- Currently, fire stations in Bangladesh rely solely on phone call alerts, resulting in delays and exacerbating the extent of damage.
- This research aims to design an automated, real-time fire alert system leveraging Building Information Modeling (BIM) technology tailored to Bangladesh's unique context.
- The proposed BIM-based fire alert system was tested on a prototype building to evaluate its effectiveness in detecting fires and notifying key stakeholders, such as property owners, control rooms, and fire stations.
- The system enhances safety and minimizes damage by enabling users to pinpoint the exact fire location on a building plan via an Android device or a display monitor.

January 2022 – December 2022

Responsibilities: In this research study, my primary responsibility was conducting the survey. I collected data from 255 construction professionals via email, Google Forms, and Skype to assess and quantify the significance of COVID-19 impacts on the construction sector.

- The study identified 18 significant impacts of COVID-19 on the construction sector, with job cuts, schedule delays, project suspensions, cost overruns, and mental health effects emerging as the most critical.
- Unpaid leave and job cuts were identified as fundamental impacts, serving as root causes that influence other significant challenges within the sector.
- These impacts collectively hinder national economic growth and development.
- Using MICMAC analysis, the study emphasizes prioritizing solutions for unpaid leave and job cuts to mitigate widespread economic and developmental consequences.
- The findings offer valuable insights for companies, employees, and governments to develop effective strategies for addressing COVID-19 impacts, fostering economic stability, improving construction sector operations, and enhancing social security.

PROFESSIONAL EXPERIENCE

May 2023- Present **Energypac Power Generation Ltd.**

Sr. Design Engineer

Key Responsibilities:

- Analysis and Design of Building Structure (Both Steel and RCC Structure) maintaining building codes and standards
- Structural Audit
- Preparing Engineering Assessment Report
- Coordination with site teams
- Troubleshoot the problems generated in the field

Dec 2020 - April 2023 **Sthapona Consultants**

Structural Engineer

I have worked with over 250 structures varying in functions, shapes, sizes, and requirements. I have also worked on some International Projects (mainly USA-based).

Key Responsibilities:

- Analysis and Design of Building Structure (Both Steel and RCC Structure) maintaining building codes and standards
- Structural Audit
- Preparing Engineering Assessment Report
- Coordination with site teams
- Troubleshoot the problems generated in the field

Mar 2020- Dec 2020 **Ahyan Real Estate Ltd.**

Key Responsibilities:

- Overall supervision of sub-structural and super-structural works of B1+B2+G+26 storied Five Star Hotel Building having an area of 1725 sqm per floor. Supervised the construction work of a 2meter thick mat foundation, retaining wall, basement 2, basement 1, and Ground floor

Laboratory Demonstration Responsibilities:

- Prepare the laboratory testing material and supply the student with online
- Deliver the lecture during the testing and explain each type of test
- Answer the student question during the testing
- Evaluate the individual test report

Advising: Other than Research Direction/Responsibilities:

Undergraduate Level during my last two years of BSc:

- Tutoring every week after the lectures for a few courses
- Consulting students during their design project courses
- Participated as an invigilator during course quizzes and evaluated assignments and quiz scripts
- Worked as a lab demonstrator for lab-based courses

Professional Attributes:

- Exhibits a progressive mindset, excelling in foundational tasks while systematically tackling complex, high-level challenges.
- Possesses exceptional adaptability, rapidly assimilating new concepts and thriving in dynamic academic and professional settings.

- Combines a self-reliant work ethic with outstanding collaboration skills to drive collective success.

REFERENCES AVAILABLE TO CONTACT

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