Meftah Uddin

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Personal Website: Meftah Uddin **Personal Blog:** LLM4Energy **Other Weblinks:** GitHub, Google Scholar

SUMMARY

Energy professional with expertise in Thermal Management, Building Energy Modeling, and HVAC Optimization. Led over 50 energy audits, recommending $8.75M in savings and reducing more than 160M lbs. of CO_2. Proven track record of impactful research published in prestigious journals, with a focus on advancing energy efficiency of manufacturing and building sectors, reducing emissions, and developing innovative tools to drive future research. Certified *LEED Green Associate*.

Skills: Computational Fluid Dynamics (CFD), Heat Transfer, Design of Experiment (DoE), Statistical Analysis (ANOVA, Regression, Optimization etc.), Machine Learning (ML), Large Language Model (LLM), Financial Analysis, Time Series Analysis.

EDUCATION

PhD in Mechanical Engineering, University of Missouri-Columbia, Missouri, USA **May 2026**
CGPA: 3.92
Project: Pathways to Net-zero Building Design using Parametric Analysis and Generative AI

MS in Mechanical and Aerospace Engineering, University of Missouri-Columbia, Missouri, USA **Jul 2024**
CGPA: 3.89
Project: Demand Control Building Energy Management and Timeseries Forecasting using Machine Learning Model

BS in Mechanical Engineering, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh **Feb 2017**
CGPA: 3.54
Project: Flow Visualization and Experimentally Calculate the Major Losses of UPVC Pipes
Capstone: Unmanned aerial vehicle (UAV) design and fabrication: an aluminum framed quadcopter

JOB EXPERIENCE

Energy Auditor at Midwest IAC, Columbia, Missouri, USA **Sep 2022 – May 2026**
Lead efforts in a U.S. Department of Energy funded training and assessment program, improving energy efficiency in manufacturing plants and commercial buildings.
Mentoring ~15 undergraduate students annually in energy auditing and efficiency engineering

- Conducted 50+ industrial and commercial energy audits, serving as lead auditor on 17+ audits.
- Evaluated facility utility use (electricity, gas, water, HVAC, lighting, wastewater) and conducted on-site measurements.
- Recommended energy conservation measures with ROI analysis, projected savings, and carbon reduction metrics based on ASHRAE Level II standards.
- Provided clients with practical roadmaps to improve efficiency and integrate renewable systems.

Research Assistant at University of Missouri, Columbia, Missouri, USA **Aug 2021 - Aug 2025**

- Parametric simulations to perform sensitivity analysis of building geometric factors on energy consumption, utilizing advanced Statistical methods and Latin Hypercube Sampling (LHS) for comprehensive analysis.
- Optimized Solar Water Heater systems through Plackett-Burman and Central Composite Design for cost-benefit analysis, maximizing system efficiency and reducing operational costs.
- Developed and published OpenStudio measures to the NREL-hosted Building Component Library, contributing to the open-source community and enhancing building simulation resources.
- Developed AI-driven methods for HVAC energy analysis using EnergyPlus and Machine Learning, including the implementation of a Digital Twin framework to model real-time energy performance and carbon emission monitoring.
- Applied LSTM-based time series forecasting for energy consumption predictions and optimizing energy efficiency through predictive modeling.
- Implementing occupancy-based control (OBC) for ventilation rate and temperature set points in campus building.
- Creating a building information modeling (BIM) and Digital Twin of a campus building at university campus.
- Numerical analysis to describe the melting phenomena of the solid-liquid phase change materials (PCM) and experimental validation of the model.

Assistant Engineer at Sirajganj 225x3 MW CCPP (NWPGCL), Bangladesh **Jul 2018 - Jul 2021**

- Certified Combined Cycle Power Plant (CCPP) Operation Engineer with 1000 hours of Gas and Steam Turbine operation.
- Maintained and troubleshot Gas Turbines (Siemens SGT5-2000E), Steam Turbines, HRSG, Compressed Air Systems, Nitrogen Generation Systems, and Water Treatment Plants.
- Managed over $1 million worth of procurement of spares, tools, and consumables; assisted in Annual Procurement Plan execution.
- Led Major Overhaul of Steam Turbine (HRSG leak test, X-ray and Dye Penetration tests of turbine rotor and blades).
- Conducted Minor Inspection of Gas Turbine (borescope inspection, Dye Penetration tests of combustion chamber).

Executive Engineer at Square Pharmaceuticals Ltd., Dhaka, Bangladesh **Oct 2017- Jun 2018**

- Maintenance of HVAC system, Water Treatment Plant, Boilers, Compressed Air System, Nitrogen Generation Plant
- Responsible for writing and updating Standard Operating Procedure; scheduling, planning using ERP (SAP) Software.
- 2D Drawing and associated civil works for the installation of Air Compressor and auxiliaries.
- Responsible for monitoring HVAC design, Cooling Load and Air Flow rate calculation for Nasal Spray production line installation.

Engineer Intern at Energypac Engineering, Dhaka, Bangladesh **Aug 2017 – Sep 2017**

- Actively engaged in the mechanical design phase of a three-phase distribution transformer body, collaborating with the General Manager at Energypac Engineering Ltd.
- Acquired practical experience in CAD-based design interpretation, materials selection, and manufacturing feasibility analysis within a transformer production environment.

TECHNICAL PROFICIENCIES

Programming Language: Python, Ruby, MATLAB, R.
Data Analysis & Visualization: Excel, Power BI, R, SQL and Python.
Cloud Platforms: Google Cloud Platform, Docker Desktop, Gitlab, Kubernetes.
HVAC Energy Simulation: Grasshopper-Ladybug and Honeybee, OpenStudio, EnergyPlus, BEopt.
Drawing and Design Tool: SOLIDWORKS, AutoCAD 2D, Rhino-Grasshopper, Revit.
CFD Simulation: ANSYS Fluent, Openfoam.

PROJECT EXPERIENCE

OpenStudio Measure Development **Aug 2024 – May 2025**

- Developed and contributed five energy modeling measures, for example: AddPCMtoEnv and AddSolarPVT, to the OpenStudio ecosystem, enabling users to simulate phase change materials (PCM) and solar photovoltaic-thermal (PVT) systems in building energy models. Measures are published on the NREL Building Component Library (BCL) and available on GitHub under Openstudio_Measures_meftah for public use and collaboration.

Statistical Analysis of building energy use intensity (EUI) **Jun 2023 – Dec 2024**

- The energy use intensity (EUI) between commercial and residential building among five cities in the United States are statistically compared using dataset from BPD website.

Net Zero Building Design **Jan 2023 – May 2023**

- To design a baseline residential building model complying with ASHRAE Standard 90.1.2016 using perspective path.
- Addition of renewable source to the baseline model to ensure NetZero building.

AWARD & SCHOLARSHIP

- Best Poster Award, Engineering and Informatics Category, ShowMe Research Week, University of Missouri, 2024
- "Bangladesh-Sweden Trust Fund" Travel Grand for Higher Study Abroad, 2022
- Education Board Technical Scholarship, 2012-2016, BUET

PROFESSIONAL AFFILIATION

- **Student member**, Association of Energy Engineer (**AEE**)
- **Student member,** The American Society of Mechanical Engineers (**ASME**)

LEADERSHIP

- President, Bangladesh Student Association (BSA), University of Missouri **Sep 2023 – Sep 2024**
- GPC Department Representative, Mechanical and Aerospace Engineering, University of Missouri **Aug 2023 – Sep 2024**