

Ivan Ehsan

Kolkata • India

✉ ivanen911@gmail.com ☎ +91 7001156922 [in](#) [g](#) [u](#)

Education

National Institute of Technology Mizoram

Jul. 2018 - Jun. 2022

B.Tech in Mechanical Engineering

Aizawl, India

- CGPA: 7.01
- Project: POWER GENERATION FROM FREESTREAM WATER USING HYDROKINETIC SAVONIUS TURBINE
- GATE Qualified 2025 (Score-487)

Publications

- **Patient-specific simulation of particle dynamics in the respiratory airways from CT-scan-reconstructed images using a continuous phase modelling framework.**
Computer Methods and Programs in Biomedicine, 2025.
Subho Samanta, **Ivan Ehsan**, Harish Hirani, Suman Chakraborty.
DOI: [10.1016/j.compbiomed.2025.110354](https://doi.org/10.1016/j.compbiomed.2025.110354)
- **Anatomically-trained patient-specific in-silico simulations for predicting thermo-regulation and humidification in human body upper respiratory pathways**
International Journal of Thermal Sciences, 2026.
Subho Samanta, **Ivan Ehsan**, Harish Hirani, Suman Chakraborty.
DOI: [10.1016/j.jjthermalsci.2025.110461](https://doi.org/10.1016/j.jjthermalsci.2025.110461)
- **Tracing Aerosols in the Human Airways: The Hidden Role of Temperature Gradients**
International Communications in Heat and Mass Transfer, 2026.
Subho Samanta, **Ivan Ehsan**, Harish Hirani, Suman Chakraborty.
DOI: [10.1016/j.icheatmasstransfer.2026.110882](https://doi.org/10.1016/j.icheatmasstransfer.2026.110882)
- **Virtual Experiments Reveal How Human Anatomy Shapes Risk from Airborne Nanoparticles.**
(Communicated)
Subho Samanta, **Ivan Ehsan**, Harish Hirani, Suman Chakraborty.

Work Experience

Indian Institute of Technology Bombay

Jan. 2026 - Present

Project Research Assistant

Mumbai, India

- Performed CFD analysis of Domestic Pressure Regulators (DPR) for LPG systems to evaluate flow characteristics, pressure regulation performance, and safety parameters under varying operating conditions.
- Conducted experimental investigations on DPR prototypes to validate CFD results and assess mechanical performance and operational stability.
- Combustion simulation for hydrogen-air premixed micro-combustors, focusing on flame stability, temperature distribution, and efficiency characteristics.

CSIR-Central Mechanical Engineering Research Institute

Jul. 2024 - June.2025

Project Associate

Durgapur, India

- Conducted CFD simulations using CONVERGE for hydrogen mixing and combustion in SI engines, focusing on PFI and DI strategies, air-fuel ratios, and injection timings.
- Conducted CFD simulations to analyze airflow patterns and particle deposition in a 3D out-of-plane Weibel lung model and actual human lung model under varying respiratory conditions.
- Analyzed nanoparticle deposition in bronchial airways at resting conditions using CT-scan based airway models and combined Lagrangian-Eulerian modeling.

Indian Institute of Technology Jodhpur

Aug. 2022 - Dec. 2023

Project Fellow

Jodhpur, India

- Bio-fuel combustion analysis using computational fluid dynamics.

- Fluent UDF code development for Flamelet Generated Manifold method analysis of laminar premixed flame(CH₄).
- Designed CAD model and fabricated Micro-Gas Turbine with bluff body and swirler to study lean and rich mixtures of hydrocarbons.
- Collected data using a StellarNet spectrometer and analyzed emissions for different fuel combustion, focusing on flame characteristics, emissions understanding, and temperature calculation using MATLAB.
- Development of highly efficient and low-cost insulation for power plant boilers.

Richedu

Jun. 2021 - Oct. 2021

Design Intern(Remote)

Vancouver, British Columbia

- Developed CAD models for a Fire-Fighting Robot, focusing on material selection and functional testing using FEM technology.
- Researched and recommended materials for the robot chassis, considering mechanical properties and project requirements.

Technical Proficiencies

- **CFD Tools:** ANSYS FLUENT, CONVERGE CFD, Tecplot, OpenFOAM
- **FEA & Simulation:** ANSYS MECHANICAL, FEM
- **CAD/CAE:** SolidWorks, AutoCAD, Fusion 360
- **Programming & Analysis:** MATLAB, FLUENT UDF, C, LaTeX
- **Systems & Utilities:** Linux, MS Office, OriginLab, Raspberry Pi
- **Instrument Operational Skills:** High-Speed Visualization Camera (Phantom), Charge-Coupled Device (CCD) Camera, Thermography Cameras (FLIR), Spectrometer (StellarNet), Data Acquisition Systems (DAQ), Mass Flow Meter (ALICAT), Exhaust Gas Analyzer (Testo 350)

Professional Development

CONVERGE CFD Advanced Online Training — August 2024

ENGR2000X: A Hands-on Introduction To Engineering Simulations CornellX. 07/2021 - 09/2021

Machine Learning: Logistic Regression, Artificial Neural Network, Machine Learning (ML) Algorithms, Machine Learning on MATLAB, Octave. 09/2021 - 11/2021

Additive Manufacturing (3D Printing): Fundamentals to Practice with Future Research Potential and Recommendations. Foreign Faculty Khalid Ra (Singapore). 12/2019

Development of bio-inspired components for the future: multi-material, multiscale, multi-physics, multi-functional Foreign Faculty Filipe Samuel Silva (Portugal). 10/2019

Languages

English: Full Professional Proficiency **Bangla:** Native Proficiency **Hindi:** Conversational Proficiency

References

Dr. Subho Samanta

Principal Scientist, CSIR-CMERI

✉ subho.samanta@cmeri.res.in