**SHUBHANKAR SINHA**
Noida, Uttar Pradesh, India
**Email id:** sinha.s.shubhankar@gmail.com; **Phone number:** +91 74285 59975; **LinkedIn:**www.linkedin.com/in/sinha-shubhankar

## OBJECTIVE

To use experience as a mechanical engineer and patent analyst with a focus on computational design, structural optimisation, and clean energy systems to spur innovation. striving to create and implement novel sustainable engineering solutions by utilising rapid prototyping, FEA, topology optimisation, and AI/ML techniques.

## EDUCATION

Bachelor of Technology in Mechanical Engineering **September 2021 - July 2025**
Vellore Institute of Technology, Vellore, Tamil Nadu
**CGPA:** 8.79/10

## ACADEMIC PROJECTS

**1. Developing efficient structural systems for small satellites** **January - April 2025**

Developed and optimized small satellite structural systems, including topology optimization and genetic algorithms, to reduce mass while maintaining mechanical strength and reliability.

Conducted Finite Element Analysis (FEA) to simulate the satellite's structural behavior under various conditions, including launch vibrations and thermal loads.

In addition, utilized additive manufacturing (3D printing) to fabricate complex geometries, such as iso-grid and honeycomb configurations, which have high strength-to-weight ratios and are difficult to produce with traditional methods.

Achieved 20% weight reduction from 300g to 240g through topology optimization and lattice structure integration

**2. Feasibility study of GeoTABS for various building types in different Indian climate zones July – December 2024**

**Team size:** 2 **Team role:** Team Leader

The project was funded by the Science and Engineering Research Board (SERB) - DST and extension of the work *Feasibility study of ground source heat pumps for different building types under Indian climate zones*

Developed a simulation model for Ground Source Heat Pump (GSHP) and Thermally Activated Building System (TABS) systems (GeoTABS) to assess performance across various Indian climatic zones and building types.

In addition, analyzed heating and cooling loads, peak electricity demand, and peak loads for different cities.

**3. Designing of Natural Ventilation System for Building Envelope** **July – December 2023**

**Team size:** 2 **Team role:** Team leader

Developed a digital twin model for the natural ventilation system in MATLAB, incorporating innovative design techniques including evaporative cooling, honeycomb-structured windows with phase change materials, and sky radiative cooling. Secured 50,000 INR funding from ISHRAE to prototype digital twin model using sensor integration and develop MQTT communication protocol for climate simulation in Vellore, India.

## PUBLICATION

**B Karthikeyan, G Praveen Kumar, Shubhankar Sinha et al (2024); Strategic Optimization of Large-Scale Solar PV Parks with PEM Electrolyser-Based Hydrogen Production, Storage, and Transportation to Minimize Hydrogen Delivery Costs to Cities,** *Journal of Applied Energy* DOI LINK: https://doi.org/10.1016/j.apenergy.2024.124758

## WORK EXPERIENCE

**1. Lakshmikumaran Sridharan Attorneys | Patent Analyst | Delhi** **July 2025 - Present**

Working on the technical drafting of patent documents and claims, including Provisional, Complete, and Complete-After-Provisional Applications to legally define and protect inventions.

Consulting directly with inventors and R&D teams from major clients, analyzing the technical advantages and patentability of their inventions under legal statutes.

Executing strategic patent prosecution tasks and assist in hearings for IPO, EPO and USPTO, including formulating techno-legal responses to office actions and conducting in-depth invalidity searches.

**2. Navyug Infosolutions Pvt Ltd | Mechanical Design Engineer | Noida** **March - June 2025**
Designed and employed rapid prototyping via 3D printing to develop Tactical Engagement Simulators (TES) for the Indian Army using SolidWorks and Catia V5 while implementing ISO standards and applied Geometric Dimensioning and Tolerancing principles.
Collaborated cross-functionally with engineering teams to integrate mechanical designs with multiple sub systems. Secured tender for a product through Innovations of Defence Excellence (iDEX), resulting in initial production order volume of 91 units.
**3. Department of Energy Science and Engineering | Research Intern | IIT, Delhi** **November 2024 - April 2025**
Conducted research on two-fluid modelling of direct steam generation in parabolic trough solar collector receivers using Volume of Fluid (VOF) method in ANSYS Fluent.
Performed three-dimensional thermal-hydraulic simulations analyzing vapor volume fraction, pressure drop, and temperature distribution under non-uniform heat flux conditions at operating pressures ranging from 30-100 bar.
Investigated flow boiling characteristics and phase change phenomena] of concentrated solar power (CSP) technology for sustainable energy generation
Developed numerical models and uniform distribution function incorporating turbulence parameters, critical heat flux wall boiling, and heat loss mechanisms to predict system performance under varying mass flow rates (0.3-0.6 kg/s)
**4. GAIL(India) Pvt Ltd | Operations & Maintenance Intern | Delhi** **June - July 2024**
Contributed to pipeline maintenance through ILI report analysis and subsequent repair activities, including magnetic particle testing and coating.
Developed competence in pipeline integrity management by applying pigging and intelligent pigging technologies.
**5. Solid States Physics Laboratory, DRDO| Research Intern | Delhi** **August – December 2023**
Conducted research on Molecular Beam Epitaxy (MBE) grown Cadmium Telluride (CdTe) epitaxial layers.
Employed Reflection High-Energy Electron Diffraction (RHEED) to monitor the crystalline structure growth *in situ* on the substrate.

## SKILLS
Programming and Data: Python, C, C++, MATLAB, EES, Power BI, Origin Pro
CAD Software: SolidWorks, Siemens UG/NX, Catia, Blender
CAE Software: Ansys (FEA, Structural), Ansys Fluent (CFD), Comsol Multiphysics
Energy and Simulation: EnergyPlus, DesignBuilder

## CERTIFICATION
ISWDP Samsung Student Fellowship - IISc Bangalore, Samsung and Synopsys **October 2025 - Present**
Merit-based fellowship under IISc's India Semiconductor Workforce Development Program. Comprehensive training in semiconductor design, fabrication processes, and VLSI technology
Cryogenic Hydrogen Technology - IIT Kharagpur **February - April 2025**
Completed 12-week NPTEL course on cryogenic systems for hydrogen liquefaction and storage. Explored applications in clean energy infrastructure, including storage tanks, transfer systems, and safety protocols for hydrogen as a fuel.
Toyota Production System - IIT Roorkee **August - October 2023**
Completed 12-week NPTEL course on lean manufacturing principles and just-in-time production systems. Gained expertise in waste elimination (Muda, Mura, Muki), value stream mapping, and continuous improvement (Kaizen).

## LEADERSHIP
University Football Team | Vice Captain | VIT, Vellore **August 2022 - January 2025**
Indian Society of Heating, Refrigeration and Air Conditioning | Technical Head | VIT, Vellore **May 2023 - Jan 2025**

## COMMUNITY INVOLVEMENT
Institution For the Blind | Volunteering | Amar Colony, Delhi **Jan 2023 - Present**.