Shrey Sahai Gupta

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About me

Doctoral candidate advancing Thermal Sciences for a Sustainable Energy Future

Knack for Interdisciplinary research

Developing realizable Control Strategies for Supercritical CO_2 Power Conversion Systems

Personal

Date of Birth: 1st Nov 1998
From: Agra, India
Marital Status: Single

Areas of specialization

Thermofluids
sCO_2 systems
Turbomachines
Cycle Thermodynamics
System Dynamics

Technical Skills

System Simulations
Model Predictive Control
Software Packages: ANSYS Fluent, Twin Builder
COMSOL Mutliphysics

Programming
Python | MATLAB | C++ | Modelica

Research Methodologies
Literature Review
Technical Writing and Presentation
Data Visualisation: Matplotlib | MS Excel

Awards

Prime Minister Research Fellow | Government of India

Top 5 Pitches | **Falling Labs, Bengaluru** 2023

Agastya **Science Communication Fellow** 2023

Department Rank-2 | **IIT Ropar**.

Silver medal | **Inter-IIT Tech Meet** 2018

Work Experience

Sep,20 to Jun,21 — **Hindustan Petroleum Corporation Ltd.**
Operations Officer · Bathinda, India
• Supply, Operations and Distribution • Worked on the conversion of tank loading facility from top to bottom loading configuration

May,19 to Jul,19 — **Diverta Inc.**
Software Development and AI Intern · Tokyo, Japan
• Developed a multi-tag select component for RCMS website on VueJS • Developed an Auto-tagging model to cluster similar-looking customers in a shop footage

May,18 to Jun,18 — **Volvo Eicher Commercial Vehicles Ltd.**
Mechanical Engineering Intern · Indore, India
• Feasibility study, process scheduling, cost estimation, etc. for a shifting project of an Air Supplying Unit to higher elevation

Education

Doctoral Thesis
Mechanical Engineering
Indian Institute of Science Bengaluru | *Aug 2021-Present*
GPA:9.7/10

Bachelors in Technology
Mechanical Engineering
Indian Institute of Technology Ropar | *2016-20*
GPA:8.76/10

High School, **Central Agra Public School** | *2016* | GPA: 9.12/10

Publications

Optimal Part-Load Performance of sCO_2 Brayton Cycles During Inventory Control
Journal of Engineering for Gas Turbines and Power | 2025
Shrey S. Gupta, Pramod Kumar

Inventory Management and Control Options for Transient Operation Of sCO_2 Brayton Cycles
ASME Turbo Expo | 2025 *Shrey S. Gupta, Pramod Kumar*

Off-Design Performance Of sCO2 Waste Heat Recovery Cycles Implications Of System Design
ASME Turbo Expo | 2025 *Shrey S. Gupta, Pramod Kumar*

Evaluation of Cold Flow Test Conditions and Fluid for a 60-kW Radial sCO_2 Turbine ASME Turbo Expo | 2024
Syed J. Hoque, Shrey S. Gupta, Pramod Kumar

Projects

Control Studies on sCO_2 Power Conversion Systems | *Doctoral Research Topic* Investigation of sCO_2 cycles as an energy transition solution for modern power needs | Development of suitable control strategies and feedback systems

Model Predictive Control of an Inverted Pendulum System | *Aug 2022* Implementing single shooting non-linear MPC for set-point tracking of an inverted pendulum-cart system.

Potential Flow Simulation Past Cascades | *Prof. Raghuram Govardhan | Aug 2021 – Dec 2021* Calculation of inviscid flow field past axial impellers using Vortex panel method on conformal-mapped infinite linear cascade.

Mechanical Tissue Deformation During Thermal Ablation | *Prof. Ramjee Repaka Aug 19 – Jul 20* | Estimating tissue deformation by incorporating three-state protein denaturation in Pennes bioheat equation.

Ergonomic Crutches | *Inter IIT Tech Meet | Nov- Dec 2018* | Design of Ergonomic Crutch for patients with prolonged crutch usage and are at high risk of crutch palsy

Extra Cirricular

• Student liasion, sCO_2 committee & student reviewer, Turbo Expo 2025, International Gas Turbine Institute, American Society of Mechanical Engineers (ASME)
• Delegated IISc, Bangalore at Technology Exhibition, G20 Clean Energy Meet 2023.
• Content Creator, Science for Rural India
• Organising Team, Sports / Cultural Fests, IIT Ropar
• Placement Coordinator 2019-20, IIT Ropar
• Plays basketball, chess, and guitar and write poems

Teaching Assistance

• **Teaching Assistant**, Gas Dynamics, National Programme on Technology Enhanced Learning, India
• **Teaching Assistant**, Transport Processes, National Programme on Technology Enhanced Learning, India
• **Course Instructor**, Thermal Engineering of sCO2 Power Conversion Systems, PMRF-ISSS Lecture Series
• **Teaching Assistant**, Hydraulic Lab 2024, Dayalbagh Engineering College, Agra