

# PONSUGANTH MUTHURAMAN

Stanford University, California

+91 9789003785 • [ponsu@stanford.edu](mailto:ponsu@stanford.edu) • [ponsuganth.github.io](https://github.com/ponsuganth)

## Education

### Stanford University

Sept 2024 - Jun 2026

*Master of Science, Sustainable Design and Construction Program*

### Indian Institute of Technology Madras, India

Nov 2020 - July 2024

*Bachelor of Technology (Honours), Civil Engineering*

CGPA: 8.85/10, Department Rank: 2/113

## Scholastic Achievements

- Awarded the prestigious **MITACS Globalink Fellowship** to take up an international research project in Canada (2023)
- Awarded **Kalidas Madhavpeddi Scholarship** for the best B.Tech. student in the Civil Engineering Department (2023)
- Secured a percentile of **99.05%** in Joint Entrance Examination Mains among **1.4 Million** candidates (2020)
- Won **bronze medal** in the **National Physics Olympiad UAE** conducted by International Olympiad Foundation (2020)

## Bachelor's Thesis

### Building a Sustainability Dashboard for the IIT Madras Campus

(Jan'24 - May'24)

*Guide: Prof. Ashwin Mahalingam, School of Sustainability, IIT Madras*

- Developed a dynamic dashboard for IIT-M, to provide a comprehensive view of the campus's sustainability performance
- Designed an intuitive interface using Power BI and Canva, enabling easy analysis of real-time sustainability metrics
- Collaborated with stakeholders through expert consultations and surveys, ensuring the dashboard aligns with the needs of the IIT-M community

### Benchmarking Sustainability in Buildings in the Indian Context

(Jul'23 - Nov'23)

*Guide: Prof. Ashwin Mahalingam, School of Sustainability, IIT Madras*

- Analysed 64 LCA studies to study net emissions, comparing performance of Indian buildings with global standards
- Proposed a competitive sustainability benchmark for Indian buildings, successfully validated it against a typical Indian house
- Developed a scalable workflow for benchmarking sustainability in buildings, adaptable for various regional contexts in India

## Research Experience

### Guided Waves-based Damage Detection and Localization using signal processing

(Aug'23 - Nov'23)

*Guide: Prof. Ayan Sadhu, Smart Cities and Communities Laboratory, Western University, London, Ontario*

- Analyzed data from an open access data set of baseline and multiple damage-case measurements of 12 sensors
- Used a signal processing tool called Local Maximum Synchrosqueezing Transform (LMSST) to extract parameters
- Worked on introducing an algorithm to detect and localize damage using parameters extracted from LMSST on sensor data

### Modal identification analysis of Unreinforced Masonry Buildings under seismic loads

(May'23 - Aug'23)

*Guide: Prof. Ayan Sadhu, Smart Cities and Communities Laboratory, Western University, London, Ontario*

- Worked on identifying modal parameters of a structure using various signal processing methods and validating them
- Found modal parameters for a URM building with 40 accelerometers' data using Second-Order-Blind-Identification(SOBI) method
- Explored and performed the analysis of mode shapes using the acquired modal frequencies by SOBI method

## Academic Projects

### Do Markets Regulate Better?

(April'24)

*Guide: Prof. Santosh Kumar Sahu, Energy Economics Term Paper*

- Evaluated the effectiveness of India's Perform Achieve Trade (PAT) scheme in reducing energy intensity in the Textiles sector
- Used a fixed effects DiD model to uncover energy intensity reductions and anticipatory effects post-PAT scheme announcement
- Also evaluated R&D outcomes over a decade, offering policy insights for market-based programs in developing countries

### Assessing Financial Viability of NAC, alongside quantifying Intangible Benefits

(April'24)

*Guide: Prof. Nikhil Bugalia, Construction Economics and Finance Course Project*

- Applied the DiD method to assess the impact of the New Academic Complex at IIT Madras on departmental performance
- Adapted financial models to account for intangible benefits like academic productivity and research collaborations
- Conducted comprehensive financial analyses, including B/C Ratio, Rate of Return, Sensitivity, and Risk Analysis using Monte Carlo Simulation

## Understanding Koyambedu Market: Analysis of Chaos, Control, and Sustainability

(November'23)

Guide: Prof. Solomon Benjamin, Built Environment and Society Term Paper

- Explored Koyambedu Market's urban dynamics, tracing its evolution and analyzing state-led interventions for transformation
- Examined key actors in the market through fieldwork, emphasizing social power structures and their narratives of sustainability
- Problematised the state blaming vendors' alleged noncompliance as the only reason hindering sustainable initiatives

## Solid Waste Management in the Koyambedu Wholesale Market Complex, Chennai

(November'23)

Guide: Prof. S.M. Shiva Nagendra, Environmental Monitoring and Data Analysis Term Paper

- Investigated current solid waste management practices in place at the largest wholesale perishable goods market in Asia
- Recommended strategies for Koyambedu Market to enhance practices and foster sustainability in its operations

## Project Scheduling for construction of a Standard Residential Home in Tamil Nadu

(May '23)

Guide: Prof. Ashwin Mahalingam, Construction Project Management Course Project

- Estimated the durations of and relations between activities from drawings and work breakdown structures of a residential house
- Prepared a Gantt Chart for the project highlighting the critical path using Microsoft Projects

## Water Reservoir Design in the Gadana river basin, Tamil Nadu

(November '22)

Guide: Prof. Venkatraman Srinivasan, Water Resources Engineering Course Project

- Estimated net irrigation water requirement and assessed the proposed site for satisfactory flow and topography
- Estimated design storm based on SCS approach for a dam of design life of 100 years with 50% reliability
- Routed the design storm through the reservoir and performed checks for inundation at downstream towns

## Technical Skills

- **Programming Languages:** MATLAB, Python, C **Softwares:** STAAD.Pro, HEC-HMS, Fusion 360, AutoCAD
- **Scientific Tools:** MS Projects, MS Office, L<sup>A</sup>T<sub>E</sub>X

## Relevant Courses

- **Environmental Sciences and Sustainability:** Environmental Engineering - Water Resources Engineering - Environmental Monitoring and Data Analysis - Sustainable Engineering and Life Cycle Analysis<sup>c</sup> - Surface Water Hydrology - Transport of Water and Wastewater
- **Mathematics :** Probability and Statistics - Linear Algebra - Multivariate Calculus - Series and Matrices
- **Social Sciences:** Energy Economics - Built Environment and Society - Principles of Economics - Fundamentals of Operations Research

c - Certified Online Course

## Extra-Curricular Activities

- **Head, Shaastra<sup>1</sup> Debunk** (*Shaastra 2022-23, IIT Madras*): Spearheaded a **team of 6** to run the **first-ever student initiative** against misinformation in India, with an estimated budget of ₹200k+ and collaborated with **Google, BOOM, dataLEADS**.
- **Coordinator, Shaastra Mind Trials** (*Shaastra 2021-22, IIT Madras*): Part of a **team of 8** that threw light on the field of **Behavioral Science** in India and conducted **India's first** behavioural impact case study competition with a budget of ₹100k+ for **700+ participants**
- **Social Impact through Mind Trials:** Improved **pedestrian safety in 3 high-risk zones** in Chennai, by increasing foot-over-bridge usage by **32%**, with the help of government's transportation department. Collaborated with an NGO to **enhance restroom usage** by men in two rural villages from **83% to 100%**.
- **Word Games:** An avid enthusiast and part of the **IIT Madras contingent** that competes in word games events across India. **Won** the Inter IIT Scrabble League that witnessed 200+ participants from 8 IITs

1. Shaastra is the annual technical festival of IIT Madras