VISHWANATH RAVINDRAN

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EDUCATION

Indian Institute of Science (IISc), Bengaluru 2024-2026*
M.Tech in Mechanical Engineering
CGPA: 9.82*/10

Indian Institue of Technology Tirupati (IITTp) 2020-2024
B.Tech in Civil Engineering
CGPA: 9.55/10

Devi Academy Senior Secondary School 2020
Senior secondary education (CBSE-based)
Score: 96.8%

RESEARCH INTERESTS

Structural mechanics, Construction automation, Product and Instrument design

PUBLICATIONS

Migration of particles suspended in yield stress fluids: Insights from numerical simulation of pipe flow of 3D printable concrete
Authors: *Vishwanath R.*, A. V. Rahul, Thiyagarajan R
Journal of Non-Newtonian Fluid Mechanics, Volume 332, 2024, Link.

PATENTS

Patent documentation for an invention titled
"A multi-fluid dynamic inline mixer cum extrusion system"
Inventors: Thiyagarajan R., A. V. Rahul, *Vishwanath R.*
is currently underway (Documentation handled by CSRC team, IIT Tirupati).

CONFERENCE PUBLICATIONS/PRESENTAITONS

Inline mixing of accelerator for concrete 3D printing application: Numerical simulation using computational fluid dynamics
Authors: *Vishwanath R.*, A. V. Rahul, Thiyagarajan R.
CONSEC-2024

Revisiting the Mechanical Advantage of Compliant Mechanisms
Authors: *Vishwanath R.*, G. K. Ananthasuresh
iNaCoMM-2025 (under review)

Computing the Centre of Elasticity in Planar Frames
Authors: *Vishwanath R.*, G. K. Ananthasuresh
iNaCoMM-2025 (under review)

Cell-actuated Compliant Mechanisms
Authors: *Vishwanath R.*, G. K. Ananthasuresh
MARSS-2025

RESEARCH EXPERIENCE

Graduate researcher, IISc Bengaluru **[May '25 -]**
(Supervisor: Dr G. K. Anathasuresh, IISc, Bengaluru)
Thesis title: *Biohybrid Compliant Mechanisms*

Undergraduate researcher, IITTp **[August '23 - May '24]**
(Supervisor: Dr A. V. Rahul and Dr Thiyagarajan R., IIT Tirupati)
Bachelor thesis title: *Numerical Modelling of Fresh Cementitious Materials - Application in Concrete 3D Printing*

Summer (2023) Intern, Robotics Lab IITM **[May '23 - August '23]**
(Supervisor: Dr Asokan Thondiyath, Dept of Engineering Design, IIT Madras)
Project topic: *Design and fabrication of a novel dynamic inline mixer system*

Summer (2024) Intern, Building Materials Lab IITTp **[May '24 - August '24]**
(Supervisor: Dr A. V. Rahul, Dept of Civil Engineering, IIT Tirupati)
Project topic: *Study on inline mixing of admixtures during 3D printing of concrete through numerical and experimental means*

More details about each project, along with other projects, are provided on the personal website.

RECENT PROJECTS (UNPUBLISHED)

Energy Dissipation in Particle-based Impact Damper Systems: Investigation based on Elasto-plastic impact model **[Jan '24 - Apr '24]**
Term project for the course "ME701L Non-linear dynamical systems"
Abstract: In this work, the non-linear dynamics of the particle damper system subject to impact load is assessed by employing the elasto-plastic model, which is used to accurately predict energy losses during a collision. Using the model, energy dissipation and other system characteristics of the particle damper system are studied, and the damping performance of the system is evaluated.

Design and fabrication of lab-scale concrete 3D printer
Guide: Dr. Thiyagarajan, IIT Tirupati **[Nov '23 - Dec '23]**
Abstract: Concrete 3d printing is a recent technology which relies on the success of additive manufacturing technologies to digitally fabricate complex geometries. This particular field has garnered significant research attention in recent years as it offers possibilities for construction automation. In this project, a gantry-based concrete printer system with a mobile bed is designed and fabricated for the Building Materials lab at IIT Tirupati.

ACHIEVEMENTS

Received **Aarvee Associate Institute award** for securing the highest cumulative GPA in the 2024 graduating batch in the civil engineering discipline, awarded by the academic office, IIT Tirupati.

Attended the **International Symposium on Automation and Robotics in Construction (ISARC) 2023** conference as a sponsored student delegate from IIT Tirupati.

Received **Academic excellence awards** for 2^{nd}, 3^{rd} and 4^{th} year of undergraduate studies in civil engineering, awarded by the academic office, IIT Tirupati.

Placed First in **"Design Different" competition at Civil Conclave 2022** (Inter IIT Civil engineering competition) organised by IIT Roorkee.

Placed First in **"Code-it" competition at SAMNIVESHA 2024** (Civil engineering fest organized by IIT Patna).

POSITIONS OF RESPONSIBILITY

Pupil Head of Devi Academy Senior Secondary School **[Jan '19 - March '20]**
Elected Pupil head of Devi Academy Senior Secondary School with a student population of more than 1200 students.

Contingent Leader of IIT Tirupati for Civil Conclave 2022 **[Dec '22]**
Represented the students of civil engineering as their contingent leader in civil conclave.