

SKANDHAN KARTHIKEYAN

Email: skandh1308@gmail.com; Phone: +1 610-483-8206

ACADEMIC QUALIFICATION

Bachelor of Technology in Mechanical Engineering, CGPA 8.78/10.00

Nov'21 – Jul'25

Indian Institute of Technology Madras (IITM), Chennai, India

Ranked in the top 15% of the 2021 - 2025 Batch, Selected as a UNAI Millennium Fellow of the Class of 2024 (Top 8%)

ACHIEVEMENTS

- Award for the best presentation in the Young Investigator Workshop, International Soft Matter Conference – 2024
- Contributed to NSF ID: 2104986 titled Mechanics of Granular Materials, guided by Dr. Karen Daniels, NCSU.
- All India Rank 2401(Top 1.69%) in JEE Advanced – 2021; All India Rank 2242(Top 0.24%) in JEE Main – 2021.

TECHNICAL SKILLS & COURSES

Technical	Languages - MATLAB, Python, C++, LATEX	Software - Simulink, P_Scope, Unity, Fusion 360
MOOCs	Coursera – Advanced Learning Algorithms (2022), Supervised Machine Learning (2022), Generative AI with Large Language Models(Ongoing)	
Professional	Artificial Intelligence in Manufacturing, Process Optimization, Measurements Instrumentation & Control	
Core ME	Kinematics and Dynamics of Machinery, Manufacturing Processes, Design of Machine Elements, Energy Conversion Systems, Heat Transfer, Applied Thermodynamics, Probability Statistics & Stochastic Processes	

RESEARCH EXPERIENCES

LiDAR and Camera-based Navigation Algorithm for Lane-keeping in Unstructured roads IITM, Chennai, India

Dr. Anuj Tiwari, Department of Mechanical Engineering

Nov'24 – May'25

- Classical Machine learning based system as a lightweight benchmark for future autonomous driving applications.
- Line Segment Detector and DBSCAN based hybrid system, that adapts dynamically to challenges such as rain, uneven terrain, and curved lanes, was developed for safety-first systems in semi-structured roads.

Analysis of Granular systems using Photoelastic Grain Solver (PeGS) – Internship

IITM, Chennai, India

Prof. Krishnamurthi Ramesh, Department of Applied Mechanics & Biomedical Engineering

Dec'22 – May'25

Modeled photoelastic disks using closed-form stress field equations to evaluate forces in granular particles.

- Reduced computation by 50% and increased efficiency by 35% leading to faster analysis.
- Developing a robust framework for force evaluation of large assemblies of granules, accounting the effects of tangential components, with the aim of enhancing stress analysis accuracy of higher order forces.

Delay compensation in networked robotic systems – Undergraduate Research Project

IITM, Chennai, India

Dr. Anuj Tiwari, Department of Mechanical Engineering

Jan'24 – Feb'25

Formulated a feedback control algorithm to compensate for network delays in mobile, ground robots.

- Enhanced control through the modeling of robot dynamics and the identification of system characteristics.
- Devised an observer-based mechanism for minimizing cohesion loss of robots in transition using DSR.

Particle-Scale Measurements of Interparticle Forces on Photoelastic Disks (NSF funded)

NCSU, Raleigh, USA

Prof. Karen E Daniels, Daniels Lab, Department of Physics

Jun' 24 – Jul' 24

Established a non-invasive technique to evaluate the coefficient of inter-particle friction between soft granular disks.

- Conducted photoelastic analysis to determine the vector contact forces between the particles.
- Presented the research results in the Young Investigators Workshop, International Soft Matter Conference - 2024.

Autonomous factory – Internship

IITM, Chennai, India

Prof. Samuel GL, Department of Mechanical Engineering

Jan'24 – May'24

Developed a digital twin for a customized 3D printer in Unity for visual feedback of print.

- Collaborated with 3D printing field experts to identify heat transfer characteristics and integrated the effects.

Club Strategist, Electronics Club (IITM)

Apr' 22 - Apr' 24

- Developed a versatile indoor tour gear – MAARG, that provides location-based audio inputs using inertial measurement sensors, under the guidance of Prof. Ayon Chakraborty.

Student Mentor, Avanti - Pondicherry Chapter

Dec' 21 – Aug' 22

- Mentored 4 students to successfully clear JEE Advanced-2022 and secure admission into their dream IITs.

INDUSTRIAL EXPERIENCES**Blooming Mill Intern, JSW Steel, Salem, India**

Jun' 23 – Jul' 23

- Assessed rolled steel by comprehending the safety measures and worked with the quality assurance team.

Design Engineer, Carbon Minus Energy Private Limited, Chennai, India

Jan' 23 – Apr' 23

- Designed solar structures for a 9-acre agri-voltaic farm by assessing the agricultural and geographic data.

ACADEMIC PROJECTS**Active Vibration Control of a cantilever beam | Course Project ME2400**

Jan' 23 - May' 23

- Constructed the dynamic model of the assembly using the principles of system identification.
- Examined the experimental data to validate the transfer function & fine-tuned to achieve stability.

Automated Umbrella | Course Project ME2201

Jul' 22 - Nov' 22

- Designed and developed a six-bar-hood mechanism that ensures protection of the wheelchair user.
- Prototyped a working model and enhanced the system incorporating user feedback.

LEADERSHIP ROLES**Vice Captain, Madras Hawks**

Jun' 23 – May' 24

- Headed the institute's squash team to a 3rd place finish in the regional inter-collegiate tournament - 2023.

Club Strategist, Electronics Club (IITM)

Apr' 22 - Apr' 24

- Designed customized ESP-32 development boards with 12V-5V buck converter and CP2102 driver for the club.
- Led a team of 7 aimed at rehabilitating the paraplegic using an assistive device – Versagrip, under the guidance of Dr. Manish Anand in collaboration with R2D2, IITM.
- Developed a versatile indoor tour gear – MAARG, that provides location-based audio inputs using inertial measurement sensors, under the guidance of Prof. Ayon Chakraborty.

Technical Affairs Secretary (TAS), IITM

Aug' 22 – May' 23

- Elected for establishing an innovative technical culture managing multiple stakeholders. Enhanced participation by 100% in the events conducted by the Technical Society. Recognized as Best TAS for 2022-23 for the efficient management of budget duly achieving results.

Student Mentor, Avanti - Pondicherry Chapter

Dec' 21 – Aug' 22

- Mentored 4 students to successfully clear JEE Advanced-2022 and secure admission into their dream IITs.

VOLUNTEERSHIP**Covid Warrior, Project Sahara**

Jun' 21 – Jan' 22

- Coordinated logistics for vaccination drives and streamlined operations to minimize wait times in Coonoor of Nilgiri district, Tamil Nadu, India.
- Volunteered to distribute food and medical supplies to 200+ impacted by the pandemic in underprivileged and untraversed interior hill regions.

Volunteer, Vriksh 10K

Dec' 23 - Jan' 24

- Participated in the planting of saplings and raised awareness among communities in preserving the ecology of Coonoor. Engaged with 1000+ local residents and school students to encourage long-term care for the trees.
- Assisted in fundraising activities to reach to business organizations for donations to support the initiative.

Charity participant, Talent Hunt Marathon

Aug '24

- Ranked 3rd in the marathon conducted by Rotary Club, Tiruvannamalai for awareness about diabetes.