

EXPERIENCE

- **FARE Fellow** July 2025 - Present
Indian Institute of Technology Kanpur, India
- **Project Associate (Student)** Sep. 2024 - Dec. 2024
Indian Institute of Technology Kanpur, India
- **Junior Project Fellow** Feb. 2019 - May 2019
Indian Institute of Technology Jodhpur, India
- **Post Graduate Engineer Trainee** July 2018 - Sep. 2018
Larsen and Toubro Construction, Chennai, India

EDUCATION

- **Ph.D. in Mechanical Engineering** December 2025
Indian Institute of Technology Kanpur, India
- **M.Tech in Mechanical Engineering** July 2018
Indian Institute of Technology Jodhpur, India
- **B.Tech in Mechanical Engineering** July 2015
Jodhpur Institute of Engineering and Technology, Jodhpur, India

AWARDS AND HONORS

- **Fellowship for Academic and Research Excellence (FARE), IIT Kanpur** July 2025 - June 2026
- **Ph.D. Fellowship of Ministry of Education (MoE), India** Aug. 2019 - July 2024
- **M.Tech Fellowship of MoE, India** Aug. 2016 - July 2018

RESEARCH INTERESTS

- Humanoid robotics
- Legged locomotion on slippery deformable terrain,
- Contact mechanics and physics-based simulation
- Energy-efficient motion planning
- Multibody dynamics and whole-body control
- Data-driven modeling and learning-based control

JOURNAL PUBLICATIONS

- [J4] Sunil Gora, Shakti S Gupta and Ashish Dutta. 'Weighted Task Priority Based Angular Momentum Control for Cyclic Gait of Humanoid Robot on Deformable Terrain.' *[Revision Submitted]*
- [J3] Sunil Gora, Shakti S Gupta and Ashish Dutta. 'Gait Generation of a 10-Degree-of-Freedom Humanoid Robot on Deformable Terrain Based on Spherical Inverted Pendulum Model.' *ASME Journal of Mechanisms and Robotics*, 17, no. 2 (2025) - DOI: <https://doi.org/10.1115/1.4066428>
- [J2] Sunil Gora, Shakti S Gupta and Ashish Dutta. 'Energy-Based Footstep Planning of Biped on Uneven Deformable Terrain Using Nonlinear Inverted Pendulum.' *ASME Journal of Mechanisms and Robotics* 15, no. 5 (2023) - DOI: <https://doi.org/10.1115/1.4055999>
- [J1] Deepak Raina, Sunil Gora, Dheeraj Maheshwari, and Suril V. Shah. 'Impact modeling and reactionless control for post-capturing and maneuvering of orbiting objects using a multi-arm space robot.' *Acta Astronautica* 182: 21-36 (2021) - DOI: <https://doi.org/10.1016/j.actaastro.2021.01.034>

CONFERENCE PROCEEDINGS

- [C5] **Sunil Gora** and Ashish Dutta. ‘Foot-terrain Deformation based Parameters Identification of MuJoCo for Simulation of Bipedal Locomotion on Deformable Terrain.’ *IEEE ICRA Workshop on the Path Towards Generalizable Contact-Rich Robotics: Control and Representation (CR2@ICRA2026)*.
- [C4] **Sunil Gora**, Shakti S. Gupta, and Ashish Dutta. ‘Gait Generation of 22-DOF Humanoid Robot on Hard and Deformable Terrain with Double Support Phase.’ *13th International Workshop on Robot Motion and Control (RoMoCo)*, pp. 1-6. IEEE (2024) - DOI: <https://doi.org/10.1109/RoMoCo60539.2024.10604372>
- [C3] **Sunil Gora**, Shakti S. Gupta, and Ashish Dutta. ‘Gait Generation of 6-DOF Biped Robot on Inclined Deformable Terrain Using Nonlinear Inverted Pendulum.’ *Advances in Robotics-6th International Conference of The Robotics Society*, pp. 1-6. (2023) - DOI: <https://doi.org/10.1145/3610419.3610445>
- [C2] **Sunil Gora**, Shakti S. Gupta, and Ashish Dutta. ‘Optimal Gait Generation of an 8-DOF Biped Robot on Deformable Terrain using Floating-base Dynamics.’ *Advances in Robotics-5th International Conference of The Robotics Society*, pp. 1-6. (2021) - DOI: <https://doi.org/10.1145/3478586.3478640>
- [C1] Deepak Raina, **Sunil Gora**, and Suril Vijaykumar Shah. ‘Modeling and Estimation of Closed-Loop Impact for Multi-arm Space Robot While Capturing a Tumbling Orbiting Object.’ *Machines, Mechanism and Robotics*, pp. 561-570. Springer, Singapore, (2019) - DOI: https://doi.org/10.1007/978-981-10-8597-0_48

THESIS

- **Gait Generation of Humanoid Robot on Deformable Terrain using Spherical Inverted Pendulum Model** (Ph.D. Thesis)
Advisors: Prof. Ashish Dutta and Prof. Shakti S Gupta July 2019 - June 2025
In this thesis, I have developed a footstep planning algorithm for bipedal locomotion on deformable terrain. The foot-terrain interaction model is included in the simplified dynamics to account for terrain deformation. An energy-based gait-generation framework for the spherical inverted pendulum during the single-support phase and the suspended pendulum during the double-support phase is proposed and experimentally validated.
- **DeNOC based Parallel Dynamics Algorithms for Multibody Systems** (M.Tech Thesis)
Advisors: Prof. Suril V. Shah July 2016 - July 2018
In this thesis, I reformulated the inverse and forward dynamics algorithms using Decoupled Natural Orthogonal Complement (DeNOC) matrices for parallel processing systems and implemented the proposed parallel algorithms on a High Performance Computing (HPC) cluster using Message Passing Interface (MPI).

TEACHING ASSISTANT

National Programme on Technology Enhanced Learning (NPTEL), IIT Kanpur, India

Advanced Robotics January - April, 2025-26

Indian Institute of Technology Kanpur, India

Mechanics of Solids January - May, 2025

Robotics August - December, 2024

Robot Motion Planning January - May, 2024, 2022

Introduction to Robotics August - December, 2020-23

Robot Manipulators: Dynamics and Control January - May, 2023

Indian Institute of Technology Jodhpur, India

Dynamics of Machines January - May, 2018

Kinematics of Machines August - December, 2017

SKILLS

- **Programming:** Python, MATLAB, C, C++.
- **Softwares & Tools:** MuJoCo, ROS2, MSC Adams, Mathematica, $\text{\LaTeX}$.
- **Libraries:** openCV, PyTorch, Numpy, MPI, ElementTree.
- **CAD Softwares:** SolidWorks, PTC Creo, AutoCAD.
- **Languages:** Hindi, English.

...