



Sai Kishore Jujjuvarapu

Ph.D., IIT Hyderabad

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About Me

Mechanical engineer and applied researcher with a Ph.D. in Mechanical and Aerospace Engineering from IIT Hyderabad. Strong expertise in MEMS-based sensor design, experimental mechanics, finite element modeling (FEM), and microsystem engineering. Proven experience in R&D, including the design and development of environmental test setups, vibration testing, microfabrication, and system-level simulation. Adept in using industry-standard tools and programming languages, with a strong track record of scientific publications and collaborative research.

Skills

- **FEM Simulation & CAD:** COMSOL Multiphysics, ANSYS, CoventorWare, MEMS+, Clewin, SolidEdge, Solidworks, MATLAB, Simulink, Maple
- **Programming:** Python, C
- **Instrumentation:** Polytech MSA & LDV, Agilent Network Analyzer, M+P Analyzer, Direct Laser Writing, BIOX 3D Bioprinter, Raspberry Pi, Arduino
- **Software Tools:** Origin, LabVIEW, MS Office Suite, Inkscape, LATEX
- **Misc:** Academic research, teaching, training, consultation, LATEX typesetting and publishing

Core Competencies

- MEMS Sensors and Microsystems Design
- Environmental Testing: Vibration, Thermal, and Electrical
- Experimental Mechanics and Failure Analysis
- Electrical Testing and Data Acquisition
- Statistical Data Analysis and Report Documentation
- Lab Equipment Handling & Safety Protocols

Experience

Research Associate - Microfluidic Cell Culture System

BITS Pilani, Hyderabad Campus

Dec 2024 – Till Date

- Developed a portable Bio-Cyber Physical microfluidic cell culture platform.
- Integrated environmental control for CO₂, temperature, and humidity using embedded microcontrollers.
- Emphasized automation, portability, and real-time monitoring for point-of-care applications.

Research Associate – Vibration Testing (Honeywell Project)

IIT Hyderabad, SenAct&VD Lab

Oct – Dec 2024

- Conducted vibration analysis of HVT system using M+P analyzer.
- Identified modal frequencies and evaluated system reliability under operational loads.

Doctoral Researcher – MEMS Dynamics and Modelling

IIT Hyderabad, SenAct&VD Lab

2018- 2024

Thesis Title: Frequency and Damping analysis of Microcantilever Beams

- Studied microcantilever beams with advanced geometries (leaf-shaped, curved, hexagonal).
- Developed a MEMS accelerometer with compound lever-based compliant mechanisms.
- Employed MEMSPlus, MATLAB/Simulink for system-level simulations; validated experimentally.
- Focused on closed-loop architectures for enhanced dynamic performance.

Teaching Experience

Teaching Assistant - IIT Hyderabad

2018- 2024

Courses: Dynamics and Vibrations, Modeling and Simulation

Teaching Assistant- RGUKT, APIIT NUZ

Jan - May 2017

Courses: Solid Mechanics, Technology of Surface Coatings

Education

Doctor of Philosophy

2018 - 2024

Indian Institute of Technology Hyderabad

Department of Mechanical and Aerospace Engineering, Mechanics and Design

Masters of Technology

2018 - 2024

Indian Institute of Technology Hyderabad

Department of Mechanical and Aerospace Engineering, Mechanics and Design

Bachelors of Technology (Major)

2011 - 2015

Rajiv Gandhi University of Knowledge Technologies, APIIT, RK Valley

Department of Mechanical Engineering

Management Studies (Minor)

2011 - 2015

Rajiv Gandhi University of Knowledge Technologies, APIIT, RK Valley

Department of Mechanical Engineering.

Certifications

- Machine Learning Specialization, Coursera
- Raspberry Pi for Beginners, Udemy (2025)



Publications



Journals

- **Jujjuvarapu, S.K.**, L. Devsoth, A. Akarapu , P. Pal, and Pandey, A.K, "Frequency and damping analysis of hexagonal microcantilever beams," *Sensors and Actuators A: Physica*, vol. 375, 115542, 2024.
DOI: <https://doi.org/10.1016/j.sna.2024.115542>.
- **Jujjuvarapu, S.K.**, A. Akarapu, P. Pal, and Pandey, A.K, "Design and fabrication of leaf- based microcantilever beams," *Microsystem Technologies*, vol. 1-21, 2024.
DOI: <https://doi.org/10.1007/s00542-024-05838-1>.
- Jani*,N., **Jujjuvarapu***, S.K, P. Menon, and Pandey, A.K, "Force-amplifying compliant mechanism for closed-loop mems accelerometer," *IEEE: Sensors Letter*, vol. 8, no.12, pp. 1–4, 2024.
DOI: <https://doi.org/10.1109/ISENS.2024.3484527>.



Publications



Conference Proceedings

- **Jujjuvarapu, S.K.**, I. R. Erravally, and Pandey, A.K, "Frequency analysis of microbeam with axial pretension using msgt," in *Microactuators, Microsensors and Micromechanisms. MAMM 2022. Mechanisms and Machine Science*,, vol. no.126, IIT Hyderabad, India: Springer, Cham, Dec 2022, IsBn: 978-3-031-20353-4.
DOI: https://doi.org/10.1007/978-3-031-20353-4_15.
- **Jujjuvarapu, S.K** and Pandey, A.K, " Design and modeling of curved beam based differential capacitive mems accelerometer," in *IEEE Applied Sensing Conference (APSCON)*, Goa, India: IEEE, Jan 2023, IsBn: 979-8-3503-1727-5.
DOI: <https://doi.org/10.1109/APSCON60364.2024.10465764>.
- **Jujjuvarapu, S.K** and Pandey, A.K, " Design and modeling of differential capacitive hexagonal beam based mems accelerometer," in *Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS (DTIP)*, Dresden, Germany: IEEE, June 2024, IsBn: 2768-1874.
DOI:<http://doi.org/10.1109/DTIP62575.2024.10613242>.
- **Jujjuvarapu, S.K.**, N. Jani, and Pandey, A.K, "Design of open and closed-loop architecture in hexagonal beam-based mems accelerometer," in *IEEE Applied Sensing Conference (APSCON) 2025*, IIT Hyderabad, India, 2025.



Book Chapters

- N. Dwivedi, **Jujjuvarapu, S.K.**, and Pandey, A.K, *Thermoelastic Damping in a perforated MEMS resonators*. NIT Raipur, India: Springer, Singapore, Dec 2023, IsBn: 978-981-97-5423-6.
DOI: https://doi.org/10.1007/978-981-97-5423-6_24.
- N. Jani*, **Jujjuvarapu***, S.K, S. Menon, and Pandey, A.K, *Closed-Loop Differential Capacitive MEMS Accelerometer with a Compound Lever-Based Compliant Mechanism*. IISc, Bengaluru,India: Springer, Singapore, July 2024, pp. 313–324, IsBn: 978-981-96-3445-3.
DOI: https://doi.org/10.1007/978-981-96-3445-3_32.
- A.K. Mishra, V. D. Dwivedi, **Jujjuvarapu, S.K.**, et al., *Quadrature Error Control Closed Loop for A Dual Proof Mass MEMS Gyroscope*Ho. Chi Minh City, Vietnam: Springer, Cham, Nov 2024, pp. 319–333, IsBn: 978-3-031-83357-1.
DOI: https://doi.org/10.1007/978-3-031-83357-1_32.
- A. Pubbi*, **Jujjuvarapu***, S.K, A. K. Mishra, and Pandey, A.K, *Design and analysis of curved beam-based mechanical amplifier in MEMS accelerometer*. IISc, Bengaluru,India: Springer, Singapore, July 2024,pp. 297–311, IsBn: 978-981-96-3445-3.
DOI: https://doi.org/10.1007/978-981-96-3445-3_31.



Workshops

- Level-2 Semiconductor Packaging – CMTI, Bangalore, 2023
- Microactuators and Microsensors – IIT Hyderabad, 2022
- Enterprise Skill Development – CITD Hyderabad, 2016
- Advanced Skills for Futuristic Vehicles – IIT Hyderabad, 2023



Awards & Achievements

- **Second Prize**, ICMNSS Poster Presentation, IISc Bangalore (2024)
- **Best Paper Award**, MAMM22 International Conference, IIT Hyderabad (2022)
- **GATE Qualified** – 2015, 2016, 2017
- **32nd Rank**, APPGECET ME – 2017
- **JRF**, ARCI Hyderabad – 2017