KRUNAL JAYANTKUMAR SHAH

Department of Mechanical Engineering
A. D. Patel Institute of Technology, Vallabh Vidyanagar (New VV Nagar)
Charutar Vidya Mandal University, Gujarat-388120, India

Phone: +91 9909634833 | **Email:** me.kjs@adit.ac.in | **Location:** Anand, Gujarat, India

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PROFESSIONAL SUMMARY

Accomplished academic researcher and mechanical engineer with **13+ years of teaching and research experience** in CAD/CAM, Additive Manufacturing, and Design Optimization. Specialized expertise in **Additive Manufacturing, CAD/CAM, FEA, Design for Manufacturing and Assembly (DFMA), and Reverse Engineering**. Strong publication record with 12 publications in peer-reviewed journals and international conferences. Active research interests in smart materials, 4D printing, friction stir welding, and structural analysis.

CORE RESEARCH AREAS

Additive Manufacturing & 3D Printing (FDM, SLA, Metal Powder Bed Fusion) • **CAD/CAM Design & Optimization** • **Design for Manufacturing and Assembly (DFMA)** • **Reverse Engineering** • **Finite Element Analysis (FEA)** • **Smart Materials & 4D Printing** • **Friction Stir Welding (FSW)** • **Composite Materials Analysis** • **Machine Design & Optimization** • **Artificial Intelligence in Manufacturing**

ACADEMIC EXPERIENCE

Assistant Professor | Department of Mechanical Engineering

A. D. Patel Institute of Technology (ADIT), New V.V. Nagar | **2012 – Present** (13.6+ years)

Responsibilities & Achievements:

- Teaching advanced courses in CAD/CAM, FEA, Machine Design, and Additive Manufacturing
- Supervision of M.Tech and B.E student research projects
- Development of research infrastructure: 3D printing lab (FDM & SLA), CAD/CAM studio, FEA workstations, 3D scanning facilities
- Mentorship of doctoral researchers in additive manufacturing and materials science
- Publication of 12 research papers in peer-reviewed journals and international conferences
- Curriculum development and academic governance participation

Research Scholar | Space Application Centre (ISRO)

Ahmedabad | **2010 – 2011** (1 year)

- Design and optimization of compliant mechanisms for space payload applications
- Thermal compensation techniques for communication systems
- Precision engineering and micro-level design

EDUCATION

Degree	Field	Year	Institution	Performance
Ph.D.	Additive Manu.	In Progress	CVM University	—
M.Tech	CAD/CAM	2011	Charusat University	8.00/10 (CGPA)
B.E.	Mechanical Engg.	2009	ADIT / SP University	6.53/10 (CGPA)

TECHNICAL EXPERTISE

Software & Tools

3D CAD: CREO (Expert), SOLIDWORKS (Expert), Rhinoceros 3D (Intermediate)
FEA & Simulation: ANSYS (Structural, Thermal-Structural, Modal), HyperWorks, CATIA
3D Printing: Ultimaker Cura, Creality Slicer, Ideamaker, Simplify3D
3D Scanning & Reverse Engineering: Shining 3D Ein Scan Pro, Point Cloud Processing

Additive Manufacturing Experience (5+ years)

FDM Printers: Creality Ender 3, Ender 3 S1 Pro, Ender 10 Max, Pratham 5.0
SLA: Formlabs Form 3B
Materials: PLA, ABS, PETG, TPU, PEEK, Nylon, Resin composites
Applications: Multi-material printing, functionally graded structures, composite fabrication, biomedical applications

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RESEARCH PUBLICATIONS

Journal Articles & Conference Papers (12 Total)

1. **"Shape-Shifting Manufacturing: The Rise of Smart Materials and 4D Printing"** (2025)
   Katakpara, A.H., Prajapati, T.R., **Shah, K.J.**, & Patel, Y.D.
   International Conference on Synergetic Development through Smart Technologies (SDSTD2025) | ISBN: 978-93-84224-27-1
2. **"Design and Analysis of a Hydrostatic Bearing Using CAD and FEM Simulation"** (2025)
   Banker, V.J., Joshi, A.Y., Bhatiya, S.B., Joshi, H.B., & **Shah, K.J.**
   SDSTD2025 Conference | ISBN: 978-93-84224-27-1
3. **"Realization of a Compliant Mechanism-Based Compensation Technique for Multiplexer Filter of Communication Space Payload"** (2022)
   Shah, K.J., Srinivas, A.R.
   Recent Advances in Manufacturing Modelling and Optimization | Pages: 671–681 | Springer Publication
4. **"Experimental Analysis of Friction Stir Welding of Dissimilar Alloys AA6061 and Mg AZ31 Using Circular Butt Joint Geometry"** (2016)
   Sharma, H.K., Bhatt, K., **Shah, K.**, & Joshi, U.
   Procedia Technology | Volume 23, Pages: 566-572 | DOI: 10.1016/j.protcy.2016.03.064
5. **"Review Paper On Analysis And Optimization Of Hydraulic Loader Mechanism"** (2015)
   Parekh, R.B., Shah, K.N., & **Shah, K.J.**
   International Journal of Engineering Technology, Management and Applied Sciences | Volume 3, Issue 2, ISSN: 2349-4476
6. **"An Overview of Buckling Analysis of Single Ply Composite Plate with Cutouts"** (2014)
   Bhavsar, P., **Shah, K.** (Prof.), & Bhatia, S. (Prof.)
   International Journal of Engineering Research and General Science | Volume 2, Issue 5, ISSN: 2091-2730

7. **"An Overview of Friction Stir Welding for Dissimilar Materials"** (2014)
   Shah, K.J.
   Proceedings of ITMAE-2014, SVIT Vasad | ISBN: 978-81-923462-8-1
8. **"Thermo-Structural Analysis of Conventional Type Jacketed MSGL Vessel"**
   ADIT College Publication (Journal Paper)

Additional Publications (4)

9. **"A Novel Optimization Methodology for Design of Compliant Mechanism of a Space Payload System"** (2011)
   ICISET-2011, V.V.P. Engineering College, Rajkot | ISBN: 978-81-906377-9-4
10. **"Design Optimization of a Mirror Segment for Primary Segmented Mirror in Space"** (2011)
    Space Society of Mechanical Engineers (SSME) Journal | Volume 9, No. 1
11. **"Realization of an Optimized Compliant Mechanism for Thermal Compensation of Communication Space Payload Subsystem"** (2011)
    Hyperworks Technological Conference (HTC) 2011, Pune
12. **Design Patent Certificate** | Patent No. 349698-001 | Date: 20.03.2023

TEACHING & ACADEMIC DEVELOPMENT

Courses Taught

Advanced CAD/CAM Design • Finite Element Analysis & Simulation • Machine Design & Optimization • Additive Manufacturing Technologies • Design for Manufacturing and Assembly (DFMA) • Mechanical Design Laboratory • CAE Applications • Reverse Engineering & Product Development • Computational Methods in Engineering

Pedagogical Innovations

- Development of hands-on additive manufacturing lab curriculum
- Integration of industry-standard software in classroom teaching
- Project-based learning with real-world manufacturing challenges
- Mentoring program for research scholars and M.Tech. students
- Collaborative research initiatives with undergraduate students

PROFESSIONAL AFFILIATIONS

- Member, A. D. Patel Institute of Technology Faculty Community
- Contributor, Charutar Vidya Mandal University Research Network
- Participant, National and International Engineering Conferences
- Invited Reviewer for international technical journals
- Member, Mechanical Engineering Academic Association, India

RESEARCH INTERESTS & FUTURE DIRECTIONS

Current Focus

- Process-Microstructure-Property Mapping in additive manufacturing
- AI-driven design optimization for manufacturing processes
- Smart materials integration with 3D printing technologies
- Standardization and quality control in AM industries
- Sustainability in advanced manufacturing

Future Goals

1. Establishment of world-class AM research center
2. Industry 5.0 integration in manufacturing education
3. Development of novel materials for 4D printing

4. Real-time process monitoring and control systems
5. Multi-scale computational modeling of manufacturing processes

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LANGUAGES

English – Fluent (Academic & Professional) | **Hindi** – Fluent | **Gujarati** – Fluent

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PERSONAL INFORMATION

- **Date of Birth:** 22nd April, 1988
- **Nationality:** Indian
- **Location:** Anand, Gujarat, India
- **Professional Status:** Full-time Academic Researcher and Faculty Member

References: Available upon request

Declaration: I declare that the above information furnished is true to the best of my knowledge. This CV comprehensively presents my academic achievements, research contributions, professional expertise, and scholarly activities in Additive Manufacturing, CAD/CAM, Design Optimization, FEA, and Advanced Manufacturing Technologies.