Anandkumar Patel

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EDUCATION

Ph.D, Mechanical Engineering, *Current Cumulative GPA: 4.0/4.0* — *Sept 2023 – (Expected) May 2027*
Rutgers University, New Jersey, USA.

Select coursework: Mechanics of advanced manufacturing, Conduction heat transfer, Methods in applied math

Master of Technology (with Research), Mechanical Engineering, *GPA: 9.3/10* — *Sept 2023*
Indian Institute of Science (IISc), Bengaluru, IN.

Select coursework: Numerical optimization, Structural optimization, Dynamics and control of mechanical systems, Design for additive manufacturing, Computer-aided design (CAD)

Bachelor of Technology, Mechanical Engineering, *CPI: 9.3/10* — *May 2021*
Birla Vishvakarma Mahavidyalaya (BVM) Engineering College, Anand, IN.

Select coursework: Vector calculus and linear algebra, Numerical and statistical analysis, Materials science, Machine design, Production technology, Computer-aided manufacturing (CAM)

Schooling

Higher Secondary (Standard 12th), *98.07 Percentile* — *Apr 2017*
Gujarat Secondary and Higher Secondary Education Board (GSHSEB), Gandhinagar, IN.

Secondary (Standard 10th), *99.03 Percentile* — *Mar 2015*
Gujarat Secondary and Higher Secondary Education Board (GSHSEB), Gandhinagar, IN.

Additional certificate courses

Machine learning for engineering and science applications (NPTEL) — *Jun 2022*
- Prof. B. Srinivasan and Prof. Ganapathy | IIT Madras

Python for data science and machine learning bootcamp (Udemy) — *May 2022*
- Jose Portilla

Introduction to probability (MIT OpenCourseWare) — *Mar 2022*
- Prof. John Tsitsiklis and Prof. Patrick Jaillet

Linear algebra (MIT OpenCourseWare) — *Mar 2022*
- Prof. Gilbert Strang

Python A-Z^{TM}: Python for data science with real exercises! (Udemy) — *Jan 2022*
- Kirill Eremenko | Ligency Team

RESEARCH PUBLICATIONS

1. B. Mangrolia, J. Cleeman, **A. Patel**, S. Wei, C. Shao, H. Xu, R. Malhotra, "Continuing minimal-defect production under material integrity cyberattacks," *Manufacturing Letters*, vol. 40, pp. 54–57, Mar. 2024, https://doi.org/10.1016/j.mfglet.2024.02.006.
2. R. Malhotra, J. Cleeman, A. Jackson, **A. Patel**, and A. A. Pelegri, "Throughput scaling and thermomechanical behaviour in multiplexed fused filament fabrication," *CIRP Annals*, vol. 73, no. 1, pp. 177–180, Jan. 2024, https://doi.org/10.1016/j.cirp.2024.04.024.

Conference Publications

1. B. Mangrolia, J. Cleeman, **A. Patel**, A. Jackson, and R. Malhotra, "Real-Time Recovery From Cyberattacks on Manufacturing Processes," *International Symposium on Flexible Automation*, Jul. 2024, https://doi.org/10.1115/isfa2024-139964.
2. J. Cleeman, A. Jackson, **A. Patel**, and R. Malhotra, "Toolpath Synthesis and Mechanical Properties in Multiplexed Fused Filament Fabrication," *ASME 2024 19th International Manufacturing Science and Engineering Conference*, Jun. 2024, https://doi.org/10.1115/msec2024-126798.

OTHER RESEARCH PROJECTS

M. Tech (Research)

PSPOnto: An application ontology to aid in data-driven materials design *Oct 2022 – May 2023*

- Developed an ontology to create knowledge bases for storing material informatics (MI) datasets
- Assembled a corpus on manufacturing process parameters to assist the researchers in investigating Process-Structure-Property relations

Establishing inverse process-structure linkage using a deep convolutional neural networks (CNN) approach *Jan – Oct 2022*

- Designed and evaluated several CNN models to predict process parameters from microstructure and related metadata
- Identified typical problems with materials informatics datasets and put forth potential solutions
- Achieved 85.28% overall accuracy for an actual experimental dataset

Course Projects

- Case study of a connecting rod: evaluating different approaches to its design *Apr 2022*
- Topology optimization of CubeSat's thermal actuators *Dec 2021 – Jan 2022*

During B. Tech

Experimental thermal analysis of phase change materials (PCM) in domestic refrigerators *Jan – May 2021*

- Designed and built an experimental setup to investigate the potential application of PCM for reducing power consumption and frost formation in domestic refrigerators by elongating its refrigeration cycles
- Demonstrated an improvement of 36.28% in power consumption and an elongation of 104.34% in average cycle time under idle run conditions
- This project was awarded 1st rank in the Project Expo 2021 (organized by Institute Interaction Cell, BVM, in association with BVM Alumni Association)

INTERNSHIP EXPERIENCE

Transheat Technologies Pvt. Ltd., *Vadodara, Gujarat, India.* *May – June 2019*

- Worked on design for manufacturing (DFM) of crude oil distillation columns and similar engineering and design projects.

SOFTWARE SKILLS

- Programming : Python, MATLAB
- Software : COMSOL Multiphysics, Autodesk Fusion 360, PTC Creo, AutoCAD, Image-Pro (Media Cybernetics)

COMPETITIVE EXAMS

Graduate Record Examination (GRE) *Nov 2022*

Analytical writing: 4.0/6, Verbal: 156/170, Quantitative: 167/170, Total: 323/340

An internationally recognized graduate admission test aiming to measure verbal reasoning, quantitative reasoning, analytical writing, and critical thinking skills

Graduate Aptitude Test in Engineering (GATE), *Score: 727/1000* *Mar 2021*

A national-level examination primarily assessing the comprehensive understanding of various undergraduate subjects in engineering and science

International English Language Testing System (IELTS)

Overall band score: 8/9 *Oct 2022*
Overall band score: 8/9 *Aug 2022*
Overall band score: 7.5/9 *May 2017*

A globally recognized test assessing the candidate's listening, reading, writing, and speaking skills in the English language

Gujarat Common Entrance Test (GUJCET), *96.46 Percentile* *May 2017*

A state-level entrance test for candidates seeking admission to engineering & technology, and pharmacy courses

EXTRACURRICULAR ACTIVITIES AND ACHIEVEMENTS

Positions

- Training and placement coordinator | *BVM Eng. College* — *Sept 2018 – Sept 2019*

Achievements

- Receiving AICTE – Postgraduate (PG) Scholarship to complete M. Tech (Res.) — *July 2021 – Present*
- Secured 1st rank in the mechanical department in 3rd and 7th semesters of B. Tech — *Dec 2018 and Dec 2020*
- Won runner-up in Tech-Lock, Genesis'17 | *BVM Eng. College* — *Sept 2017*
- Won runner-up Rubix cube's institute-level competition | *BVM Eng. College* — *Sept 2017*

Attended training and workshops

- Braintronix | *TechieNest Pvt. Ltd.* — *Mar 2018*
- Induction and training program | *NPIU and BVM Eng. College* — *Feb 2018*

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