Nadimetla Thirupathi

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Education

Indian Institute of Technology Goa — Goa, India
Doctor of Philosophy — 2018–2024

- Advisor: Prof. Sachin Dnyandeo Kore, IIT Goa
- Thesis: "Numerical and Experimental Studies on Radial and Axial Electromagnetic Powder Compaction"
- Department: School of Mechanical Sciences
- CGPA: **9.0/10.0**

University College of Engineering, Osmania University, Hyderabad — Hyderabad, India
Master of Engineering (M.E)-Production Engineering (Specialization) — 2013–2016

- Advisor: Prof. Rega Rajendra, Osmania University, Hyderabad
- Thesis: "Study and Optimization of process parameters for Material removal rate of Inconel-625 alloy with Copper amp; Brass electrodes and their tool wear rates on die sink EDM machine"
- Department: Mechanical Engineering
- Percentage: **72.4/100**

PRRMEC, Shabad (Affiliated to JNTU Hyderabad) — Telangana, India
Bachelor of Technology — 2008–2012

- Department: Mechanical Engineering
- Percentage: **73.4/100**
- Final Year Project Thesis: "Increasing Efficiency and Decreasing Pollution of Two-Wheeler Using Pre-Heating Method"
- Final Year Project Advisor: Dr. Narsaiah

Shanthikenthan Junior College, Muthyampet, Mancherial — Telangana, India
Intermeidate — 2005–2007

- Department: MPC
- Percentage: **90/100**
- Board: Board of Intermediate Education, Telangana

Zilla Parishad High School, Dowdepally, Mancherial — Telangana, India
SSC — 2004–2005

- Percentage: **84.5/100**
- Board: Board of Secondary Education, Telangana

Areas of Specialization

Advanced Manufacturing Process, Design of Electromagnetic and Electro Hydro Forming Experimental Set up, Powder Compaction, High Speed Magnetic Pulse Welding, Sheet Metal Forming, Vaporizing Foil Actuator Forming, Crimping, FEM modeling of manufacturing process.

Experience

Veermata Jijabai Technological Institute (VJTI) Mumbai, India
Tenure Faculty
Department of Production Engineering 02/06/2025 - Current

National Institute of Technology (NIT) Goa Goa, India
Faculty on Contract
Department of Mechanical Engineering 29/07/2024 - 31/05/2025

Indian Institute of Technology Goa Goa, India
Junior Research Fellow on Contract
School of Mechanical Sciences 03/01/2024 - 29/06/2024

- R&D Project: Electromagnetic and Electrohydro Forming of Sheets

CVR College of Engineering, Hyderabad Telangana, India
Assistant Professor
Department of Mechanical Engineering 13/01/2018 - 27/04/2018

Aurora's Technological and Research Institute, Hyderabad Telangana, India
Assistant Professor
Department of Mechanical Engineering 20/12/2016 - 30/12/2017

Publications

Journals:

1. **Thirupathi,N.** and Lalit Kumar, Ramesh Kumar, M.R Kulkarni, Sachin D. Kore. (2024), "Experimental Investigation and Metallurgical Studies on D9 Tube to SS316 Tapered End Plug Using Magnetic Pulse Welding". Journal of Materials Engineering and Performance, vol.17, https://doi.org/10.1007/s11665-024-10029-0

2. **Thirupathi N** , Sachin D. Kore. (2024), "Finite Element Simulation of Electromagnetic Axial Powder Compaction of SS 316 Powder". Powder Metallurgy, vol.67, P.30-39, https://doi.org/10.1177/00325899231214683.

3. **Thirupathi,N.**,Sachin D. Kore (2023), "Experimental and numerical studies on electromagnetic axial powder compaction of Al 6061 powder". Powder Technology, https://doi.org/10.1016/j.powtec.2023.118595, vol.425,p.118595.

4. **Thirupathi,N.**,Ramesh kumar, Sachin D. Kore (2023), "Noncoupled Finite Element Modelling of Electromagnetic Radial Compaction of Pure Aluminium Powder". International Journal of Precision Engineering and Manufacturing, vol.24,p.325–336 https://doi.org/10.1007/s12541-022-00750-y.

5. **Thirupathi,N.**,Ramesh kumar, Sachin D. Kore (2022), "Experimental and numerical investigations on electromagnetic powder compaction of Aluminium 6061 alloy powder". Powder Technology, vol.406,p.117579, https://doi.org/10.1016/j.powtec.2022.117579.

6. **Thirupathi,N.**,Ramesh kumar, Sachin D. Kore (2022), "Effect of Electromagnetic Force on the Strength of Electromagnetic Impulse Powder Compaction". Journal of Materials Engineering and Performance, vol.31,p.10021–10034, https://doi.org/10.1007/s11665-022-07025-7.

7. **Thirupathi,N.**,Lalit kumar, Sachin D. Kore (2022), "Numerical modelling of the electromagnetic forming of seamless steel tube compression processes". International Journal of Computational Materials Science and Surface Engineering, vol.12,p.1-13, https://doi.org/10.1504/IJCMSSE.2024.139007.

Book Chapters/Proceedings:

1. **Thirupathi, N.** , Sachin D.Kore, (2024), "Electromagnetic Powder Compaction: An Experimental Study of Its Effects on Titanium Powder". Lecture Notes in Electrical Engineering, vol 1143. Springer, Singapore. https://doi.org/10.1007/978-981-97-0337-1-27.

2. Krishna, G.V.,**Thirupathi, N.** , Sachin D.Kore, (2024), "Experimental and Numerical Investigations on Electrohydraulic Forming of Al 6061 Sheet for Oil Deflector Applications". Lecture Notes in Electrical Engineering, vol 1143. Springer, Singapore. https://doi.org/10.1007/978-981-97-0337-1-28.

3. **Thirupathi, N.**,Sachin D.Kore (2022), "Non-coupled finite element modelling of electromagnetic compaction of Al 6061 powder in Al 6063 tube". https://doi.org/10.1016/j.matpr.2022.07.277. Materials Today: Proceedings.

4. Sarat Kumar Sahoo, **Thirupathi, N.**, K. Saraswathamma (2020), "Experimental Investigation and Multi-Objective Optimization of Die sink EDM Process Parameters on Inconel-625 alloy by using Utility Function Approach", Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2020.04.41.

Conferences:

1. **Thirupathi, N** (2024), "Electromagnetic Powder Compaction: An Experimental Study of Its Effects on Titanium Powder". National Symposium on High Voltage–Energy Storage Capacitors and Their Applications (HV-ESCA-23).22-24, June, Mumbai, India

2. **Thirupathi, N** (2024), "Finite Element Simulation of Electromagnetic Axial Powder Compaction of SS 316 Powder", International Conference on Power Metallurgy and Particulate Materials (PM-23), 13-15 March,PMAI,Mumbai, India.

3. **Thirupathi, N** (2022), "Numerical Modelling of the Electromagnetic Forming of Seamless Steel Tube Compression Process", International Conference on Advanced Materials and Computational Methods (ICAMCMME-22), 11– 12, November.Hyderabad, India

4. **Thirupathi, N** (2022), "Non-coupled Finite Element Modelling of Electromagnetic Compaction of Al 6061 Powder in Al 6063 tube", International Conference on Power Metallurgy (PM-22), 18- 22 April, PMAI, Mumbai, India.

5. **Thirupathi, N** (2019), "Process Parameter Optimization of Die sink EDM for machining of Inconel-625 alloy with brass electrode by using MOORA method", International Conference on Innovative Product Design and Intelligent Manufacturing System (ICIPDIMS-19),17-18,May, NIT, Rourkela, India.

6. **Thirupathi, N** (2018), "Experimental Investigation and Multi-Objective Optimization of Die sink EDM Process Parameters on Inconel-625 alloy by using Utility Function Approach", IConAMMA-18, Bengaluru, India.

Total Citations: 53, h-index: 4, i10-index: 2

Courses Taught

- Engineering Mechanics — UG, Jan-June, 2025, NIT Goa
- Engineering Drawing — UG, Jan-June, 2025, NIT Goa
- Advanced Manufacturing Lab — UG,Jan-June, 2025, NIT Goa
- Production and Operations Management — UG, Jul-Dec, 2024, NIT Goa
- Engineering Mechatronics — UG, Jul-Dec, 2024, NIT Goa
- Measurements and Metrology Lab — UG, Jul-Dec, 2024, NIT Goa
- Workshop Practices Lab — UG, Jul-Dec, 2024, NIT Goa

Graduate Courses Completed

- Advanced Optimisation Techniques — First Semester, 2018 during PhD, IIT Goa
- Mathematical Methods — First Semester, 2018 during PhD, IIT Goa
- Automation — First Semester, 2013 during ME, UCE,OU
- Metal Forming Science — First Semester, 2013 during ME, UCE,OU
- Computer Integrated Manufacturing — First Semester, 2013 during ME, UCE,OU
- Robotic Engineering — First Semester, 2013 during ME, UCE,OU
- Experimental Techniques And Data Analysis — First Semester, 2013 during ME, UCE,OU
- Engineering Research Methodology — First Semester, 2013 during ME,UCE,OU

- Non Traditional Machining And Forming — Second Semester, 2014 during ME,UCE,OU
- Metal Cutting And Machine Tool Design — Second Semester, 2014 during ME,UCE,OU
- Metalluegy Metal Casting And Welding — Second Semester, 2014 during ME,UCE,OU
- Tool Engineering — Second Semester, 2014 during ME,UCE,OU
- Advanced Non-Destructive Evaluation Technic — Second Semester, 2014 during ME,UCE,OU
- Rapid Prototyping, Principles And Application — Second Semester, 2014 during ME,UCE,OU

Assistantships

Teaching Assistance (Graduate Courses)

- Manufacturing practice lab — 2 Semester at IIT Goa
- Manufacturing Processes I — 2 Semesters at IIT Goa
- Manufacturing Processes II — 2 Semesters at IIT Goa
- Digital Manufacturing Processes lab — 2 Semesters at IIT Goa
- Computer Integrated Manufacturing — 1 Semesters at IIT Goa

Research Assistance

- Contributed in experimental work of Electromagnetic welding of D9 -SS 316 for M.Tech student (Ms.Anjali), during Ph.D at IIT Goa
- Contributed in experimental work of Electromagnetic welding of D9 -SS 316 for M.Tech student (Mr.Lalit kumar), during Ph.D at IIT Goa
- Contributed in experimental and simulation work of Electromagnetic and Electrohydro forming of sheet for M.Tech student (Ms.Ayushi Dubey), during Ph.D at IIT Goa
- Contributed in experimental and simulation work of Electrohydro forming of oil deflector sheet for B.Tech student (Ms.Gayathri), during Ph.D at IIT Goa

Research Tools

Experimental Techniques

- Electromagnetic Forming Machine (40 KJ/20 KV)
- Electromagnetic Forming Machine (10 KJ/10 KV)
- Universal Testing Machine
- Optical Microscope
- Scanning Electron Microscope
- X-ray diffraction (XRD)
- Metullurgical Polishing Machines
- 3D Printing
- Die sink EDM

Experimental Setup Development

- Innovated an Electromagnetic Radial Powder Compaction system for the consolidation of Al and Al6061 powders within aluminum and copper tubes. This included the design and fabrication of solenoid coils and field shapers, followed by a thorough characterization of powder compacts via density and porosity analysis, Vickers hardness tests, optical microscopy, SEM analysis, and compression testing.
- Developed an advanced Electromagnetic Axial Powder Compaction setup for compacting Al6061, involving the creation of a pancake coil, plunger, driver plates, and precise punch-die combinations. Conducted rigorous experiments followed by detailed characterization of sintered Al6061 pellets using density and porosity analysis, Vickers hardness tests, optical microscopy, SEM analysis, and compression testing.
- Executed complex Electromagnetic welding of D9 to SS316LN plugs for application in nuclear fast breeder reactors, analyzing weld interface and joint strength using optical microscopy, SEM, EDS, X-ray tomography, helium leak testing, and gas pressure burst testing.Pioneered the development of a highly accurate, strongly coupled FEM model using LS-DYNA to simulate the behavior of Al6061 powder during the Electromagnetic Axial Powder Compaction process.
- Spearheaded the design and development of an innovative Electromagnetic and Electro Hydro Forming setup, successfully deforming aluminum sheets into complex box shapes with hemispherical patterns

Numerical FEM Model Development

- Engineered a sophisticated loosely coupled FEM model to accurately predict the compaction behavior of aluminum and Al6061 powder within aluminum tubes using the Electromagnetic Impulse Compaction technique.
- Pioneered the development of a highly accurate, strongly coupled FEM model using LS-DYNA to simulate the behavior of Al6061 powder during the Electromagnetic Axial Powder Compaction process.

Design Skills: Solid Works, Auto CAD, Pro-E, NX-Cad, and Hyper mesh.
FEA Skills: ANSYS Work Bench, ANSYS Maxwell, LS-Dyna and Comsol Multiphysics.
Office Suite: Origin, MS Visio , LibreOffice, MS Office (Word, Powerpoint, Excel, Outlook)
Other Packages: Overleaf, Latex, ImageJ.

Awards/Fellowships

- **Best Paper Research Award** at International Conference on Powder Metallurgy and Particulate Materials (PM 23), Exhibition and 48 Annual Technical Meeting of Powder Metallurgy Association of India (PMAI), 13 to 15 March 2023, Mumbai, India.
- **Best Paper Research Award** at International Conference on Powder Metallurgy and 47 Annual Technical Meeting of Powder Metallurgy Association of India (PMAI), (PM-22), 18 to 20 April 2022 (Virtual), India.

Academic Projects Handled

1. Guided B.Tech Students project titled " Redesigning Checkweigher Conveyors -A Pharmaceutical Perspective" during July -Dec 2024 at NIT Goa

Entrance Exam Scores

GATE 2013 in Mechanical Stream,
Registration No: **ME18S21417562** and Score: **482**
All India Rank:**3848** (Appeared candidates:1,65,814)

GATE 2018 in Mechanical Stream
Registration No: **ME18S21417562** and Score: **597**
All India Rank:**7751** (Appeared candidates:1,94,496)

Departmental Responsibilities

- Lab In-charge: Machines Shop 2 — Jul-Dec, 2024, NIT Goa

Administrative Responsibilities

- Convocation Committee (Member of Academic Procession and Sitting plan on the dais) Sep 2024, NIT Goa

Certificates Received

- Received NPTEL **ELITE** certificate for **Laws of Thermodynamics** Course — July - Aug 2017

Other Academic Involvements

Conferences Attended

- Participated in institute level confluence - Reseach Scholars Confluence 2022 - IIT Goa.

Workshops Attended

- Participated in NX CAD Training organised by SIEMENS and IIT Goa CoE (Industrial Automation) Sept, 28-30, 2021.

Conference Organization

- Worked as Co-organizer for Research Scholar Confluence 2021 organized by IIT Goa.

Others

- Secured college First Place in 10+2 and Fouth Place in 10 .

Extracurricular Activities

Trecking, Cooking, Gardening, Farming.

References

Dr. Sachin Dnyandeo Kore (PhD Advisor)
Professor
School of Mechanical Sciences
Indian Institute of Technology Goa
email: sachin@iitgoa.ac.in
Ph: +91-8322490868

Dr. Arindam Das (DC Member and Course Instructor)
Associate Professor
School of Mechanical Sciences
Indian Institute of Technology Goa
email: arindam@iitgoa.ac.in
Ph: +91-8777747613

Dr. Rajesh S. Prabhu Gaonkar (DC Chairman and Course instructor)
Professor
School of Mechanical Sciences
Indian Institute of Technology Goa
email: rpg@iitgoa.ac.in
Ph: +91-9423885372

Dr. Shakthi Prasad D (DC Member)
Assistant Professor
School of Mechanical Sciences
Indian Institute of Technology Goa
email: shakthi@iitgoa.ac.in
Ph: +91 8861663357