

Dr. Srinath Gudur

Assistant Professor
Department of Production Engineering
Veermata Jijabai Technological Institute (VJTI) Mumbai
H R Mahajani Rd, Matunga, Mumbai (MH) 400 019

Mobile: (+91) 9421557767
Email: segudur@pe.vjti.ac.in
[Google Scholar](#)



Research Interests

Metal Additive Manufacturing (AM), Hybrid approaches in metal AM to enhance Geometric Complexity and Mechanical Properties, Electro-pulsing applications for AM, Real-time Monitoring and Controlling, Laser Cladding, Surface Engineering, Laser Forming.

Professional Employment

Veermata Jijabai Technological Institute (VJTI) Mumbai

Assistant Professor, Dept. of Production Engineering 03/2024 – Present

- *Courses Instructed:* Machining and Process Engineering to undergraduate students

N. K. Orchid College of Engineering & Technology, Solapur, India

Assistant Professor, Dept. of Mechanical Engineering 07/2023 – 03/2024

- *Courses Instructed:* Intellectual Property Rights, Non-Conventional Machining to undergraduate students

Indian Institute of Technology Hyderabad, India

Post-Doctoral Fellow 01/2023 – 06/2023

- Developing and installing a large-scale DED facility for the direct fabrication of rocket components for Defence Research & Development Laboratory (DRDL), Hyderabad, India
- Setup for laser-assisted wire arc additive manufacturing

N. B. Navale Sinhgad College of Engineering, Solapur, India

Assistant Professor, Dept. of Mechanical Engineering 07/2014 – 12/2016

- *Courses Instructed:* Mechatronics, Operations Research, CAD/CAM subjects to undergraduate students and conducted lab experiments

N. K. Orchid College of Engineering & Technology, Solapur, India

Assistant Professor, Dept. of Mechanical Engineering 06/2012 – 06/2014

- *Courses Instructed:* C++ Programming, CAD/CAM, Mechatronics subjects to undergraduate students and conducted lab experiments.

Education

Ph.D. in Mechanical Engineering (with specialization in Integrated Design & Manufacturing)

From **Indian Institute of Technology Hyderabad** – Nov 2022

- *Thesis:* Hybrid Approaches for Wire Arc Additive Manufacturing to enhance Product Complexity and Mechanical Properties

M.Tech in Mechanical Engineering (with specialization in CAD/CAM & Automation)

From **Veermata Jijabai Technological Institute, Mumbai** – June 2012

- *Dissertation:* Modeling of Cyclic Plasticity during Low Cycle Fatigue & Ratcheting

B.E. in Mechanical Engineering

From **Walchand Institute of Technology, Solapur** – June 2009

Research Experience

PhD Project

Hybrid Approaches for Wire Arc Additive Manufacturing (WAAM) to enhance Product Complexity and Mechanical Properties

WAAM process, typically associated with high heat inputs and complex thermal cycles, has certain challenges, like realizing complex shapes, controlling thermal distortions, reducing residual stresses, etc. The primary focus of this work is to develop a few hybrid approaches to enhance geometric complexity, and mechanical properties of wire arc additively manufactured parts. Reported to **Dr. Suryakumar S.**, Professor, Dept. of Mechanical & Aerospace Engg., Dean (Innovation, Translation & Startups), IIT Hyderabad.

Highlights of the project

1. A hybrid Bending-aided-Deposition process is developed to manufacture complex geometries. These complex geometries established the capability of this hybrid process across the following geometrical attributes:
 - Presence of overhanging features
 - Non-parallel axis of curvature of overhang
 - Non-uniform slicing
 - Constrained torch accessibility
2. Finite Element modeling of a coupled temperature-displacement moving heat source model to simulate multi-pass laser forming process
3. Extending the concept of laser forming to manufacture complex geometries. When combined with laser forming, the shape complexity of deposited components in WAAM is enhanced by:
 - Achieving sharp-edged bend angles and sudden overhangs
 - Manufacturing components with multiple overhang features without the use of support structure
 - Manufacturing components with converging overhanging features
 - Realizing components with twisted profiles
4. An electric pulse-aided-deposition process is developed to reduce the residual stresses in wire arc additively manufactured parts in-situ. The reduction in residual stress is corroborated through X-ray diffraction (XRD) results and Electron Backscattered Diffraction (EBSD) maps.

Other work during PhD

- Active involvement during installation of 2kW Laser-Direct Energy Deposition (L-DED) facility at IIT Hyderabad. Worked on optimizing the process parameters for Inconel-718 powder deposition using the L-DED process. This study also focused on real-time monitoring of molten pool thermal history variation with the layer number using an infrared pyrometer, a systematic variation of energy input to overcome the heat accumulation problem, and various strategies to control the waviness during L-DED of thin Inconel-718 wall
- A study on molten pool thermal history variation with the layer number and its influence on microstructure and mechanical properties of Inconel-625 wall deposited using WAAM process.

M.Tech. Project

Modeling of Cyclic Plasticity during Low Cycle Fatigue & Ratcheting

Adviser: Dr. A S Rao

Highlights of the project

- A multi-level test program has been carried out by Reactor Safety Division (**Bhabha Atomic Research Centre**, Mumbai) to investigate the behaviour of typical Nuclear Power Plant piping under large seismic loads
- The test program included monotonic and cyclic testing of piping material at specimens' level and components level such as elbows
- The project work describes the post-test finite element analyses of selected tests and discusses the clear perceptions gained from these analyses.

Patents and Publications

2 Indian Patents (filed) and 9 Peer-reviewed publications (6 journals, 3 conferences)

Patents

- **Srinath Ellaswamy Gudur**, Suryakumar S., and Venkata Reddy N.: *A Method and System to Fabricate a Component using Additive Manufacturing and Deformation Unit*, Indian Patent filed on 10/06/2020, Application Number: 201941016062 (First Examination Report is received and response is submitted on August, 20, 2023)
- **Srinath Ellaswamy Gudur**, Venkata Reddy N., and Suryakumar S.: *A Method for Reduction of Residual Stresses in Additively Manufactured Components through Electropulsing*, Indian Patent filed on 07/04/2022, Application Number: 202241020827.

Journals

- **Srinath Gudur**, Suryakumar Simhambhatla, and Venkata Reddy N.: *Residual stress reduction in wire arc additively manufactured parts using in-situ electric pulses*, *Science and Technology of Welding and Joining*, vol. 28, no.3, pp. 193-199, Apr. 2023
- **Srinath Gudur** and Suryakumar Simhambhatla: *Augmenting wire arc additive manufacturing with laser forming for generative realization of complex geometries*, *Optik*, vol. 262, p. 169283, Jul. 2022
- **Srinath Gudur**, Suryakumar Simhambhatla, and Venkata Reddy N.: *Enhancing the shape complexity in direct energy deposition with phased deformation*, *Int. J. Automation Technol.*, vol.16, no.5, pp. 642-653, 2022
- **Srinath Gudur**, Vishwanath Nagallapati, Sagar Pawar, Gopinath Muvvala, Suryakumar Simhambhatla: *A study on the effect of substrate heating and cooling on bead geometry in wire arc additive manufacturing and its correlation with cooling rate*, *Materials Today: Proceedings*, vol. 41, pp. 431-436, Jan. 2021
- Sagar Pawar, **Srinath Ellaswamy Gudur**, Vishwanath Nagallapati, Amit Choudhary, Arun Torris, and Gopinath Muvvala: *A study on anisotropy in wire arc additively manufactured Inconel 625 multi-layered wall and its correlation with molten pool thermal history*, *Mater. Sci. Eng. A*, vol. 840, p. 142865, Apr. 2022
- Vivek Chaitanya Peddiraju, Kranthi Kumar Pulapakura, Desuru Sree Jagadeesh, K.S.Athira, **Srinath Gudur**, S. Suryakumar, Subhradeep Chatterjee: *Weld deposition of nickel on titanium for surface hardening with Ti-Ni-based intermetallic compounds*, *Materials Today: Proceedings*, vol. 27, pp. 2096-2100, Jan. 2020.

Peer-reviewed conference proceedings

- **Srinath Gudur**, Shivam Shukla, J John Rozario Jegaraj, Mastanaiah P, Muvvala Gopinath, Suryakumar Simhambhatla: *Controlling waviness in additive manufacturing of thin walls by laser directed energy deposition process*, In: Ramesh Babu N, Santosh Kumar, Thyla PR, et al. (eds), *Advances in Additive Manufacturing and Metal Joining*, Singapore: Springer Nature Singapore, 2023, pp. 81-90 (**Best paper award**)
- **Srinath Gudur**, Suryakumar Simhambhatla: *Investigations into the effect of surface absorptivity in thin sheet laser forming using FEA*, In: Jain PK, Ramkumar J, Prabhu Raja V, et al. (eds) *Advances in Simulation, Product Design and Development*, Singapore: Springer Nature Singapore, 2023, pp. 309-318
- Rose Alifah Ellyana Roslan and Sarizam Mamat, Pao Ter Teo, Firdaus Mohamad, **Srinath Gudur**, Yuji Toshifumi, Shinichi Tashiro, Manabu Tanaka: *Observation of Arc Behaviour in TIG/MIG Hybrid Welding Process*, *IOP Conference Series: Earth and Environmental Science*, vol. 596, no. 1, p. 012025, Dec. 2020.

Machines and Instruments Experience

- Wire Arc Additive Manufacturing
- Laser Cladding (Laser-Direct Energy Deposition facility)
- Direct Metal Laser Melting (Mlab Cusing 200R, GE make)
- Electro-pulsing applications for Additive Manufacturing
- Computer Numerical Control (CNC)
- National Instruments Data Acquisition System
- Wirecut Electric Discharge Machining
- Scanning Electron Microscope
- Lasers for Surface Engineering

Programming and Computational Skills

- **Programming Languages:** C++, MATLAB (Developer: MathWorks)
- **Geometric Modeling:** Solid Edge (Developer: Siemens PLM Software)
- **Numerical Analysis:** Abaqus (Developer: ABAQUS Inc.)
- **Data preparation software for additive manufacturing:** Materialise Magics

Professional Development

- Attended Faculty Development Program on *Integrating Skills in Curriculum*, Sep 23-27, 2024, organized by **Maharashtra State Faculty Development Academy, Pune** in collaboration with Punyashlok Ahilyadevi Holkar Solapur University
- Attended Faculty Development Program on *NEP 2020 Orientation & Sensitization Programme (Online)*, June 19-28, 2024, under Malaviya Mission Teacher Training Programme (MM-TTP) of University Grants Commission (UGC) organized by **Indian Institute of Technology Kharagpur**
- Participated in *Sakura Science Program (Online)* administered by Joining and Welding Research Institute, Jan 13-14, 2022, **Osaka University, Japan**
- Achieved the course of *Sakura Science Exchange Program* administered by Japan Science and Technology Agency, Nov 27 to Dec 17, 2019, at **Osaka University, Japan**
- Attended summer school on *Sustainable and Circular manufacturing*, INMAN Project, Sept 9-14, 2019 at **Norwegian University of Science and Technology (NTNU), Gjøvik, Norway**
- Participated in DAE-BRNS Workshop on *Laser Additive Manufacturing & Allied Technologies*, LAMAT-2k18, Oct 8-12, 2018 at **Raja Ramanna Centre for Advanced Technology (RRCAT) Indore**.

Awards and Honors

- **Best Teacher** award for the year 2016-2017, from N. B. Navale Sinhgad College of Engineering, Solapur, Maharashtra
- Ministry of Education (MoE) fellowship for PhD program, Government of India.

Personal Information

Born October 11, 1987 (male, married) in Solapur, Maharashtra, India

Languages known: Telugu (mother tongue), English, Hindi, and Marathi.

References

Available upon request.

Updated on October 01, 2024.