**Dr. Tirupataiah Kasani, Assistant Professor,**
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## Academic Background

- Ph.D. (**Research area: Metal Additive Manufacturing**) in Manufacturing Engineering, from the Department of Mechanical Engineering, at Indian Institute of Technology Tirupati (IIT Tirupati), Andhra Pradesh, India.

| **Education qualification** | **Institute name** | **Year** | **CGPA/Percentage** |
|---|---|---|---|
| Doctor of Philosophy (**Ph.D.**) - Metal Additive Manufacturing | Indian Institute of Technology Tirupati (**IIT Tirupati**) | 2024 | 9.5 (out of 10) |
| Master of Technology (**M.Tech**) - Production Engineering | National Institute of Technology Rourkela (**NIT Rourkela**) | 2017 | 9.22 (out of 10) |
| Bachelor of Technology (B.Tech) - Mechanical Engineering | Bapatla Engineering College, Acharya Nagarjuna University (ANU). | 2013 | 86.5 % |
| Intermediate (M.P.C) | Bharati Junior College, Chirala | 2009 | 93.4 % |
| 10$^{th}$ Class | Aided high school, Bapatla | 2007 | 91 % |

## Projects

***Ph.D.***

Title***:*** **Fabrication and characterization of iron aluminide functionally graded material using cold metal transfer-based twin wire arc additive manufacturing process**

- Feasibility check for the deposition of iron aluminides using the CMT-TWAAM process.
- Developed a methodology to minimize the crack formation Phenomenon during the deposition process.
- Fabrication of 10-30 wt.% of iron aluminide FGM thin walls with different gradient step sizes per layer.
- Recorded current–voltage waveforms in synchronization with high-speed arc images to study the arc physics, arc behavior, and droplet transfer phenomenon during the deposition process.

- Current-voltage waveforms are used for calculating the heat input contributions from each electrode in the process.
- Measured the wire feed speeds to check the correctness of the wire feed rate.
- Macro-dimensional and microstructural studies reveal the variation in grain morphology.
- Phase characterization (XRD), EDS, elemental mapping, and hardness are measured.
- Heat treatment operations are performed on the as-deposited iron aluminide FGM thin walls to enhance the room temperature ductility and strength in build and deposition directions.
- Microstructural studies reveal that heat treatment results in the formation of Al-rich precipitates.
- Recorded thermal profiles using an IR camera for calculating the cooling rates of layers.
- Measured the residual stresses using i-XRD and distortions using a 3D scanner by applying constant clamping force.

***M.Tech.***

Title: **Effects of Surface Treatment and PVD ta-C Coated Tool on Properties and Performance Evaluation during Dry Turning of Al 7075-T6 Alloy**

- Structural characterization of ta-C coating using Raman spectroscopy.
- Cutting force measurement at low, high cutting speeds during turning using a CNC lathe.
- Surface roughness analysis followed by chip morphology.
- Built-up edge formation analysis and wear measurement of cutting tool coating.

***B.Tech.***

Title: **Heat transfer analysis of a finned tube heat exchanger using Ansys.**

- Transient heat analysis of a finned tube heat exchanger which includes the variation of temperature distribution, heat flux, and temperature gradient with respect to the time has been evaluated using the software ANSYS.
- The heat exchanger contains copper tubes (16 in number, diameter: 7.2 mm, each tube 280 mm length) with aluminum fins (55 in number, thickness 0.5 mm, the distance between fins 4.5 mm), and steel pipes are used for support purposes.

**Work Experience**

- Assistant Professor (Mechanical Engineering), Sri Vidyaniketan Engineering College (Present Mohan Babu University -MBU), Tirupati (June 2017 – December 2017).
- Senior Research Fellow under the project "Smart manufacturing platform for hybrid tandem wire arc additive manufacturing" Sponsored by SERB at IIT Tirupati (December 2022 – September 2023).
- Currently (October 2023 – till date) working as an Assistant Professor in the Department of Mechanical Engineering, SOET at ADAMAS University, Kolkata.

**Other Experience**

- **Teaching and Research Assistant at IIT Tirupati from 2018 to present** (Additive Manufacturing, Advanced Manufacturing processes, Welding metallurgy, Mechanical Measurements and metrology, Material Science and Engineering, Manufacturing systems and Metrology, Manufacturing Technology Lab, and Metrology Lab).

**Peer-reviewed journal articles**

- **K. Tirupataiah**, D.V. Kiran, N. Venkaiah, Iron aluminide FGM thin wall fabrication using CMT-based twin wire arc additive manufacturing process, Mater. Lett. (2023) 134836. https://doi.org/10.1016/j.matlet.2023.134836

- **K. Tirupataiah**, C Srihari, N. Venkaiah, D.V. Kiran "Arc behavior and metallographic analysis of crack-free Iron Aluminide functionally graded materials fabricated using twin-wire direct arc-directed energy deposition process". (Journal of alloys and compounds - Under review).

- **K. Tirupataiah**, M. Zubair, N. Mishra, S. Chakraborty, P. Dutta "State of the art on the development of iron aluminide functionally graded material using a powder-based direct energy deposition process" (Indian Welding Journal - Under review)

- **K. Tirupataiah**, Gangopadhyay Soumya "Effects of Surface Treatment and PVD ta-C Coated Tool on Properties and Performance Evaluation during Dry Turning of Al 7075-T6 Alloy" (Under review)

- **K. Tirupataiah**, D.V. Kiran, N. Venkaiah, "Effect of heat treatment in improving the ductility of iron aluminide FGMs fabricated using CMT - TWAAM process", (to be communicated).

- **K. Tirupataiah**, D.V. Kiran, N. Venkaiah "Measurement of distortion and residual stresses in iron aluminide FGMs fabricated using CMT - TWAAM process". (to be communicated).

**Work Under Progress**

- Numerical modeling of TWAAM process: Residual stress analysis for iron aluminide FGM deposition process using SYSWELD software.

**Peer-reviewed conferences**

- **K. Tirupataiah**, N. Venkaiah, D. Venkata, Cold metal transfer-based twin wire arc additive manufacturing of Iron Aluminides, International Institute of Welding (IIW), Tokyo, Japan, (2022), 91–94.
- **K. Tirupataiah**, N. Venkaiah, D. Venkata "Effect of deposition rate and deposition speed during the fabrication of iron aluminides with 10 wt. % of Al using CMT-based TWAAM process", International conference Processing and Fabrication of Advanced Materials (PFAM 29), IIT Tirupati, India, 2023. https://doi.org/10.1007/978-981-97-5967-5_12
- **K. Tirupataiah**, M. Zubair, N. Mishra, S. Chakraborty, P. Dutta "State of the art on the development of iron aluminide functionally graded material using a powder-based direct

energy deposition process" in National Welding Meet 2024, Organized by IIW at Kolkata during 26th – 27th September 2024.

**Symposium**

- Presented a paper titled "Fabrication of iron aluminide using TWAAM process" at a **Research scholars symposium** on 9th May 2023 held at IIT Tirupati.

**Membership**

- I have permanent membership in The Indian Institute of Welding, a member society of the International Institute of Welding (IIW).

**Workshops/Training attended**

- Attended a two-day Training Programme on "Additive Manufacturing & Rapid Tooling" at CMTI – Bangalore, in June 2018.
- Attended one-day workshop on "Advances in Welding Technology" conducted at Sri City, Andhra Pradesh, in November 2018.
- Attended a two-day conference on "Industry 4.0 - Opportunities, Challenges, and Preparedness" conducted at Hotel Marasa Sarovar – Tirupati, in December 2018.
- Participated in a Robotics workshop conducted by LI2 Innovations in 2011.
- I have undertaken Inplant Training at NTPC Ltd, Vishakhapatnam.

**Achievements & Fellowships**

- Ministry of Education Doctoral Fellowship (HTRA) for pursuing a Ph.D. at IIT Tirupati.
- Ministry of Education PG Fellowship (HTTA) for pursuing M.Tech at NIT Rourkela.
- Got selected in TCS for the position of Assistant System Engineer-Trainee in the Engineering and Industrial Services (EIS) field during my PG.
- Taken coaching for the Engineering Service Examination (Made Easy - New Delhi-2015) and GATE (Ace Academy – Hyderabad - 2014) Examinations.
- Qualified GATE Exam ME paper consecutively eight times from 2013 to 2020.
- Secured GATE All India Rank: 8294 in ME Paper 2014.
- Got 2nd Rank in Andhra Pradesh PGECET – 2015, Mechanical Engineering.
- Placed in TATA CONSULTANCY SERVICE, in campus placements during my UG.
- I am the project leader for the 6-member team in my B.Tech project.
- Secured second division in mathematical talent test-2006, conducted by A.I.M.Ed.

**Research and Teaching Interests**

- **Research:** Additive Manufacturing, Smart Manufacturing, Abrasive flow finishing processes, Metal cutting, Nondestructive testing (NDT).

- **Teaching:** Additive Manufacturing, Advanced Manufacturing process, Manufacturing Technology, Metrology, Mechanical Measurements, Metal cutting, Material science, and Technology.

**Courses offered (In current organization):**

- Advanced Manufacturing Technology (AMT), Automobile Engineering (AE), Engineering Mechanics (EM), Power Plant Engineering (PPE) and Experiential Learning.

**Workshops conducted (In current organization)**

- Conducted a 2-day workshop "Hands-on session on robotics using CAD software" on 14$^{th}$ &15$^{th}$ May 2024.

**Software's knowledge**

- MATLAB, CREO, and AutoCAD.
- FLOW 3D, and SYSWELD (Basic training)

**Personal details**

- Languages Known: English, Hindi, and Telugu
- Date of birth: 25$^{th}$ Aug 1992

**Permanent address:** Kasani Tirupataiah (S/o) Pitchaiah, kasani vari pale, Pudiwada, Nagaram, Bapatla, Andhra Pradesh, India (Pin-code: 522268).

**References**

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