

## **Srihari C**



**Department : Mechanical Engineering**

### **1. Academic Background**

I completed my undergraduate studies in Mechanical Engineering at Visvesvaraya Technological University Karnataka. During bachelor's degree, my interest in advanced manufacturing has enhanced, especially in the field of additive manufacturing. Hence to gain knowledge in this field and start my career in it, I got admitted to IIT Tirupati for M.Tech in Design and Manufacturing. As a part of my M.Tech thesis, I worked in the area of Wire Arc Additive Manufacturing (WAAM) under the guidance of Dr. D.V. Kiran, Assistant professor, IIT Tirupati. During the project, I also got industrial exposure by working as an intern in Materials Welding and Joining group, R&D, Tata Steel Limited.

### **2. Research Interest/Broad Area**

Interaction with various professors, researchers, and fellow students during my tenure at IIT and Tata Steel Limited, I understood the importance of interdisciplinary concepts in the manufacturing field for the country's economic growth. Hence, I developed an interest to apply interdisciplinary concepts such as image processing, artificial intelligence, and machine learning in Mechanical engineering, especially in additive manufacturing. Further, I want to work in one of the premier scientific institutes in India and contribute my bit. With this motivation, I joined as a JRF at IIT Tirupati under Dr. D.V. Kiran, who inspired me to do research during my M.Tech

programme. I executed some important experimental work as a JRF in Joining and Metallography lab, IIT Tirupati, to understand the characteristics of deposited layers and the arc behaviour in the WAAM process. Simultaneously, a numerical investigation of the WAAM process is also performed using Abaqus software during this tenure. After observing my quest for innovation and abilities, Dr. D.V. Kiran motivated me to get upgraded to a Full-time Ph.D. programme to work on the topic "Smart manufacturing platform for hybrid tandem wire arc additive manufacturing process (TWAAM)".

### **3. Advisor Information**

#### **a) Dr D V Kiran**

Dr. D V Kiran is currently working as an Assistant Professor in the Mechanical Engineering department at IIT Tirupati. He did his Masters from IIT Roorkee and PhD from IIT Bombay. He then moved to South Korea to work as a Postdoctoral Fellow at the KAIST University. Dr. D V Kiran's research has mainly focused on Welding Science and Technology, Additive Manufacturing, and Smart manufacturing.

#### **Research interest**

- Welding Science and Technology
- Additive Manufacturing
- Numerical analysis of heat transfer and fluid flow in welding and additive manufacturing processes
- Numerical analysis of residual stresses and distortion in welding and additive manufacturing welding processes
- Statistical modeling and optimization
- Smart manufacturing

#### **Achievements/ Fellowships received**

- Best PhD thesis award from Indian Institute of Welding in the area of welding for the year 2012.
- Recipient of Brain Korea 21 fellowship in the year 2012 from South Korean government.
- Recipient of Ramanujan fellowship from Science and Engineering Research Board, India.

## **b) Dr P S Sai Krishna**

Dr. P S Sai Krishna is currently working as an Assistant Professor in the Electrical Engineering department at IIT Tirupati. He did his Masters from IIT Roorkee and PhD from IIT Madras. He then worked as a Postdoctoral Fellow at IIT Madras. Dr. P S Sai Krishna's research has mainly focused on the Industrial Internet of Things (IIoT) and Cloud-based data analytics.

### **Research interest**

- Industrial Control Systems
- Internet of Things
- Control of Computing Systems
- System Identification
- Optimal and Robust Control
- Data-center Management
- Cloud Computing

### **Achievements/ Fellowships received**

- Awarded Dr. M. Mukunda Rao Endowment Prize for the Best Ph.D. thesis in Electrical Engineering in inter-disciplinary areas of Research, IIT Madras for the year 2016.
- Session best paper Award at the Conference on Advances in Control and Optimization of Dynamical Systems, (ACODS) held at IISC Bangalore Feb 2012.
- Awarded Institute Post-Doctoral fellowship for a duration of 6 months for early submission (< 4 Years) of Ph.D. Thesis at IIT Madras.
- Awarded with ABB silver award for outstanding project execution at Zetes 160MW Power plant Project, Turkey.

## **4. Thesis objectives**

- To identify the important Tandem wire arc additive manufacturing (TWAAM) process parameters and their effect on product quality.
- To perform finite element based thermo-mechanical modeling to calculate the temperature distribution, and distortion and residual stress distribution.

- To develop the adaptive feedback control system that provides the optimum set of process parameters for each layer to be deposited with consistent layer dimensions and the homogenous microstructure.
- To develop the real-time detection of defects by the image analysis-based methodology.
- To develop the live digital twin for the TWAAM process.
- To produce freeform components with the intended quality and surface finish by the developed Hybrid Tandem wire arc additive manufacturing (TWAAM-H) setup.

## 5. Teaching Assistantship

ME2204 (Manufacturing Technology), Jan - June 2020.

## 6. List of Patents/Publications

- K. Tinku, D.V. Kiran\*, A. Navneet, **C. Srihari**, "Manipulating heat density to enhance the performance of Aluminium Alloy-Steel joints using arc oscillations in the GTAW process", *Materials Letters*, 306(1), 2020 - **[IF:3.423]**.
- *A.V.S.K. Chaitanya, K.H.D.S. Uday Krishna, **C. Srihari**, P. Sudheer Kumar, D.V. Kiran\**, "An Experimental and Numerical Investigation on Wire Arc Additive Manufacturing Process", *Proceedings of the NSWEST 2021*.
- *K. Tinku, D.V. Kiran\**, A. Navneet, **C. Srihari**, "Probing the Influence of Arc Weaving in Cold Wire GTAW Process on the Mechanical Properties of Steel-Aluminum Alloy Joints", *Proceedings of the NSWEST 2021 (received best paper award)*.