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Department Mechanical Engineering

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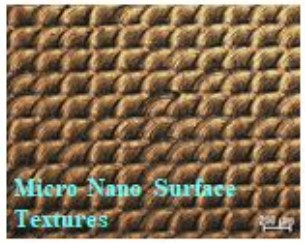
भारतीय प्रौद्योगिकी संस्थान तिरुपति

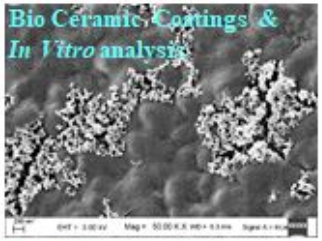
TIRUPATI

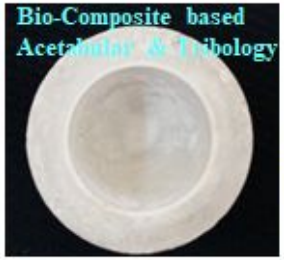
- PhD – IIT Kanpur, India
- Areas of Specialization – Ultra Precision Machining & Finishing, Biomanufacturing

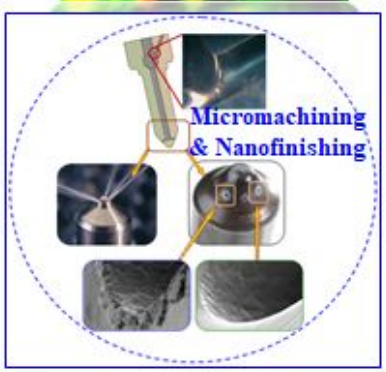
Areas of Research

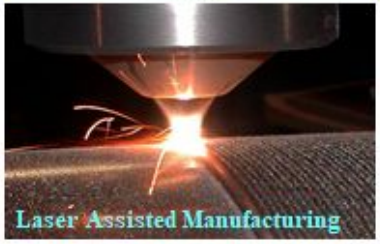
- Micro-Nano Machining & Finishing
- Additive Manufacturing
- Green Cutting Fluids
- Micro-Nano & Bio Tribology
- Laser based Manufacturing
- Online Monitoring & Smart Manufacturing
- Rheology of Polymer & Complex Fluids
- Bio-Materials and Bio-Manufacturing
- Biodegradable Polymers & Implants











K.K. Gajrani, P. S. Suvin, S.K. Vasu, **M. R.Sankar**, "Thermal, rheological, wettability and hard machining performance of MoS_2 and CaF_2 based minimum quantity hybrid nano-green cutting fluids"Journal of Materials Processing Technology, 2019, Volume 266, Pages 125-139.

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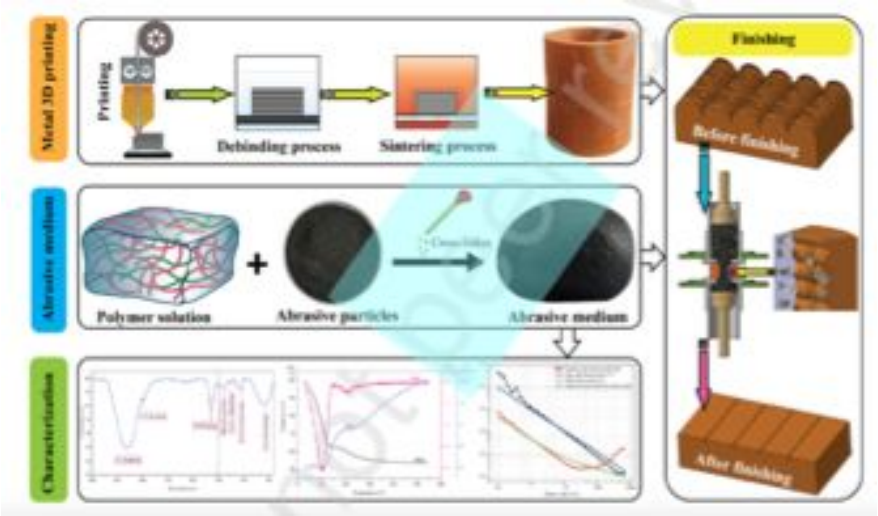
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- B.Tech. – S. V. University
- M.Tech. – NIT Tiruchirappalli
- PhD – IIT Madras, India
- Specialization – Manufacturing

Areas of Research

- Form Metrology
- Modeling and optimization of Wire-EDM
- Additive manufacturing
- Laser Machining, finishing and texturing
- Abrasive flow finishing to achieve Nano-level finishing
- Narrow-gap welding of thick plates



S.M. Basha, **N. Venkaiah**, M.R. Sankar, Development and performance evaluation of galactomannan polymer-based abrasive medium to finish atomic diffusion additively manufactured pure copper using abrasive flow finishing, ***Additive Manufacturing*** 61:103290

Dr. D.V. Kiran

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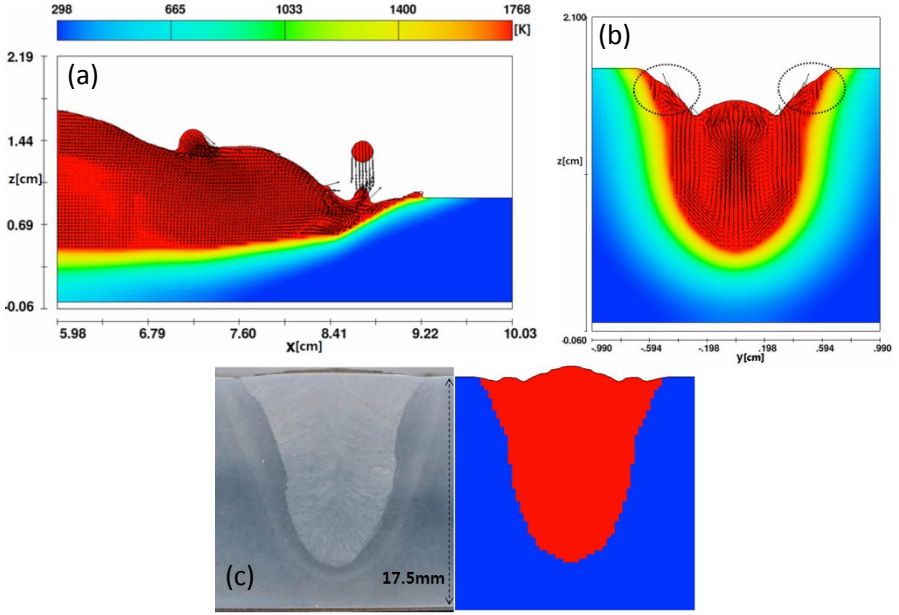
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Bombay, India
- Postdoc experience – KAIST, South Korea
- Areas of Specialization – Welding Engineering

Areas of Research

- Heat transfer and fluid flow analysis of fusion welding processes
- Thermo-mechanical modeling of welding processes
- Welding Metallurgy
- Additive Manufacturing



Calculated temperature profile along (a) longitudinal section and (b) transverse section of the weld; (c) Comparison of calculated weld bead with corresponding macrograph.

D.W. Cho, D.V. Kiran, S.J. Na, Analysis of molten pool behavior by flux-wall guided metal transfer in low current submerged arc welding, *International Journal of Heat and Mass Transfer, 2017, 110, 104-112.*

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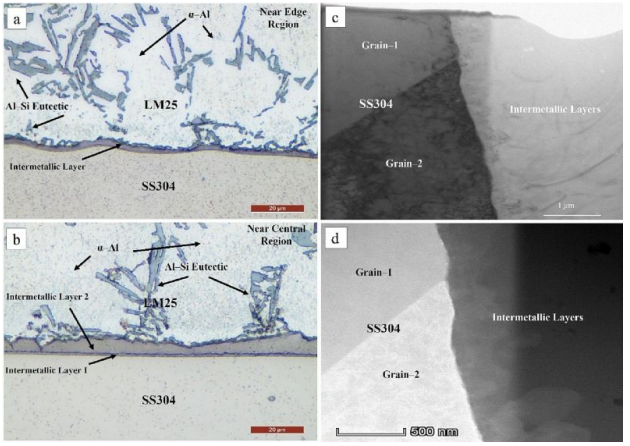
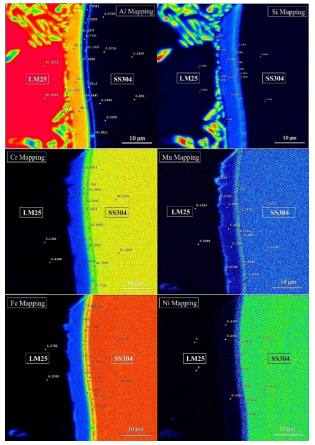
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IISc Bangalore
- Post-Doc 1– Washington State University USA
- Post-Doc 2– University of Wisconsin Milwaukee, USA
- Area of Specialization – Advanced Metal Casting, Metal Forming, Tribology and Surface Engineering





Areas of Research

- Polymer derived ceramics, Shape memory ceramics and composites
- Materials synthesis, processing, characterization
- Machine learning and simulation in materials processing
- Data-driven materials processing and characterization
- Alloy design and processing map
- Creep, Fatigue, Failure Mechanisms

- **Tirumala, Tumula, and Ajay Kumar. "Reverse cladding of 304 stainless steel to LM25 aluminium alloy through die-casting." *Materials Letters* (2023): 134896.**
- **Ajay Kumar, Tumula Tirumala. "A process for surface coating through casting with Sheet inserts" Indian Patent Application No. 202141059407, 2023.**

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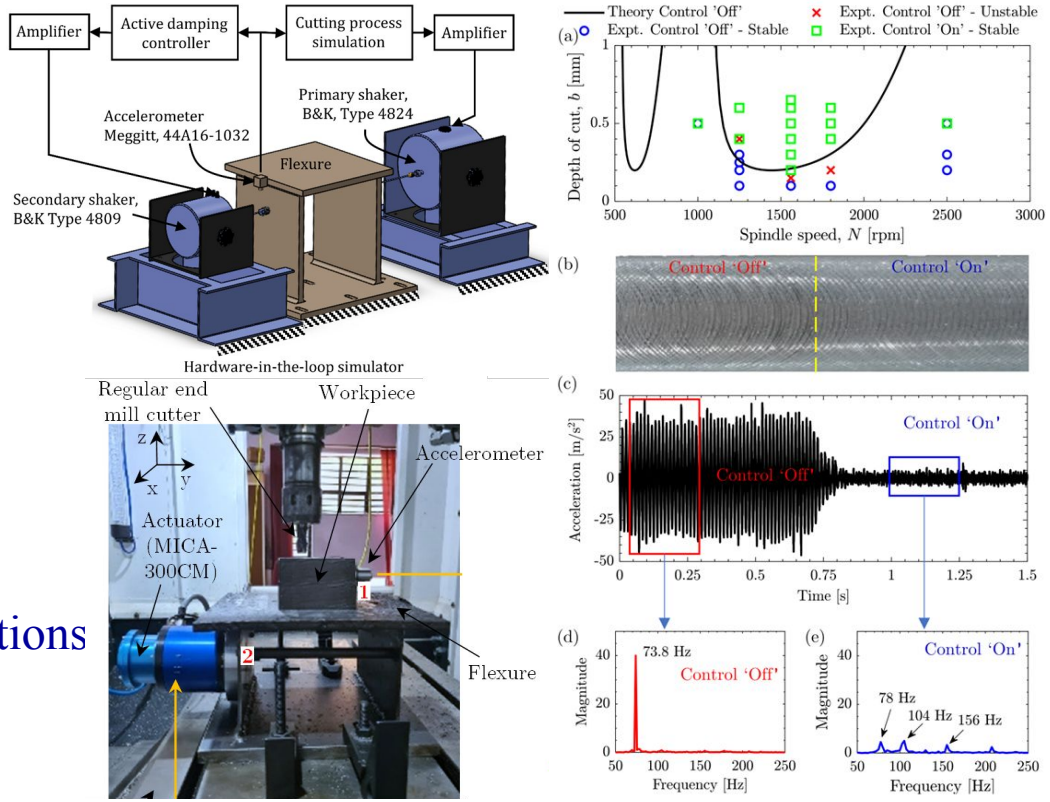
भारतीय प्रौद्योगिकी संस्थान तिरुपति

TIRUPATI

- PhD – IIT Kanpur
- Post-Doc – Fraunhofer IWU Germany
- Area of Specialization – - Machining Dynamics, Active Control of Chatter, Hardware-in-the-Loop Simulation

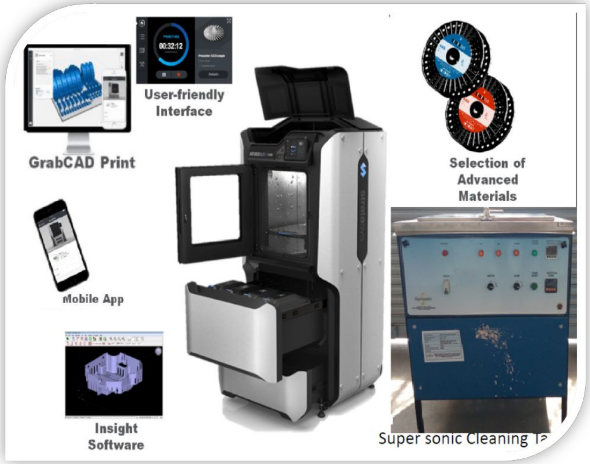
Areas of Research

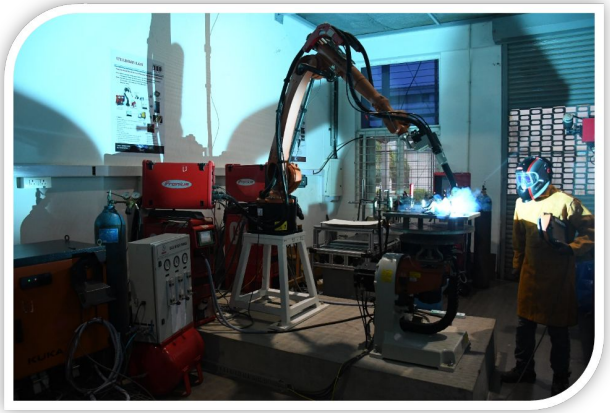
- Modelling of Machining System
- Active Control of Machine Tool Vibrations
- Smart Machine Tools System
- Virtual Manufacturing



Sahu, G.N., Deora, P., Law, M., and Wahi, P., Adaptive model-free gain tuning for active damping of machine tool vibrations, Journal of Vibration Engineering and Technologies, 2022, 10, 2799–2808. https://doi.org/10.1007/s42417-022-00520-0.

Manufacturing and Finishing: Research Facilities





Measurement and Characterization : Research Facilities