Dr. Sumanta Mukherjee
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Education

- PhD from Mechanical Engineering Department, Indian Institute of Technology, Kharagpur, India
- Master of Technology in Manufacturing Science and Engineering (Mechanical Engineering Department) from Indian Institute of Technology, Kharagpur, India
- Bachelor of Engineering in Production Engineering from Jadavpur University, Kolkata, India

PhD Thesis Title

Laser-Based Additive Manufacturing of Graded Porous Implant and Surface Modification of Ti6Al4V for Improvement of Biofunctionalities

Patent Applications

1. Preparation of porous structures with controlled and continuous variation by additive manufacturing (2017), Sumanta Mukherjee, Partha Saha and Santanu Dhara; Indian Patent Application No. 201631013286 dated 20/10/2017
2. Acetabular cup implant and a method for additive manufacturing of the same based on geodesical dome approach with continuous radially graded porosity (2018), Sumanta Mukherjee, Partha Saha and Santanu Dhara; Indian Patent Application No. 201631025559 dated 02/02/2018

Peer Reviewed Articles in Journals

1. Enhancing the biocompatibility of Ti6Al4V implants by laser surface microtexturing: an in vitro study (2015), **Sumanta Mukherjee**, Santanu Dhara, and Partha Saha; International Journal of Advanced Manufacturing Technology 76(1-4): 5-15
2. Laser surface remelting of Ti and its alloys for improving surface biocompatibility of orthopaedic implants (2018), **Sumanta Mukherjee**, Santanu Dhara, and Partha Saha; Materials Technology: Advanced Performance Materials 33(2): 106-118
3. Enhanced Corrosion, Tribocorrosion resistance and Controllable Osteogenic Potential with Alignment of Stem Cells on Micro-rippled Ti6Al4V Surfaces Produced by Pulsed Laser Remelting(2021), **Sumanta Mukherjee**, Santanu Dhara, and Partha Saha; Journal of Manufacturing Processes 65: 119-133
4. Addressing the challenges in remanufacturing by laser-based material deposition techniques

(2021), Ankit Shrivastava, **Sumanta Mukherjee**, and Shitanshu S. Chakraborty; Optics and Laser Technology 144: 107404

5. Size dependent regeneration capacity of functionalized Capra ear derived micro-tissue scaffolds for treatment of cartilage defects (2021), Pritiprasanna Maity, Sumanta Mukherjee, Subahayan Das, Mahitosh Mandal, and Santanu Dhara; doi: https://doi.org/10.1101/2021.08.10.455755
6. Silk microfiber reinforced PETG biocomposite for biomedical applications (Under review) Vijayasankar K N, **Sumanta Mukherjee**, and Falguni Pati
7. Hierarchically Micro-nano-structuring by Anodization of Laser Microrippled Ti6Al4V surfaces for Improvement of Biofunctionalities (Communicated), **Sumanta Mukherjee**, Santanu Dhara, and Partha Saha
8. Design and Additive Manufacturing of Acetabular Implant with Continuously Graded Porosity (Communicated), **Sumanta Mukherjee**, Santanu Dhara, and Partha Saha

Peer Reviewed Articles in International Conference Proceedings

1. Direct Laser Microgrooving of Ti6Al4V as a Surface Modification Method for Biological Implants (2012); **Sumanta Mukherjee**, Santanu Dhara and Partha Saha; 21st International Symposium on Processing and Fabrication of Advanced Materials, Guwahati (India)
2. Laser microgrooving of Ti6Al4V and its effect on viability of human Osteoblast-like MG63 cells (2012); **Sumanta Mukherjee**, Santanu Dhara and Partha Saha; 4th International and 25th All India Manufacturing Technology Design and Research Conference (AIMTDR), Kolkata (India)
3. Influence of Surface Roughness Parameters on MG63 Cell Viability- A Study on Laser Microtextured Ti6Al4V Surfaces (2012); **Sumanta Mukherjee**, Santanu Dhara and Partha Saha; 41st European Society of Artificial Organs (ESAO) Annual Congress, Rome (Italy)
4. A Comparative Study on the 2D and 3D Surface Roughness of Direct Metal Laser Sintered Ti6Al4V (2015); **S Mukherjee**, P Saha, R Dhara, Santanu, Sen, S Dutta, N Santanu; 4th National Conference on Advances in Metrology – AdMet2015, 42-43
5. Creation of Nano-structured oxide Layers through anodization on laser-remelted Ti6Al4V surface for improvement of Its biofunctionalities (2019); Partha Saha, **Sumanta Mukherjee**, Santanu Dhara; 5th International Conference on Nanotechnology for Better Living (NBL-2019), Srinagar, India

6. Application of a MCDM Tool for Selection of 3D Bioprinting Processes (2019); **Sumanta Mukherjee**, Jay Prakash Kumar; 1st International Conference on Innovative Product Design and Intelligent Manufacturing System (ICIPDIMS-19), Rourkela, India

7. Effect of process parameters on geometrical aspects in direct metal laser deposition of Ni5Mo5Al hardface coating (2019) Vikash Kumar, Ankit Shrivastava, Debapriya Patra Karmakar, Sitanshu Shekhar Chakraborty, Himadri Roy, Muvvala Gopinath, Prakash Kumar, and **Sumanta Mukherjee**; IOP Conference Series: Materials Science and Engineering, 576(1), First International Conference on Materials Science and Manufacturing Technology (ICMSMT 2019), Coimbatore, India

8. Estimation of residual stress and deformation of laser deposited tracks of Ni-5Mo-5Al powder using thermo-mechanical finite element simulation (2019) Ankit Shrivastava, Vikash Kumar, Vivek Singh, **Sumanta Mukherjee**, Prakash Kumar and Sitanshu Shekhar Chakraborty; IOP Conference Series: Materials Science and Engineering, 576(1), First International Conference on Materials Science and Manufacturing Technology (ICMSMT 2019), Coimbatore, India

9. Mechanical and electrochemical properties of friction stir processed magnesium alloy AZ31 for biomedical applications: A pilot study (2021) Anshu Priya, Ankit Shrivastava, Sakila Khatun, Shitanshu S Chakraborty, Poulomi Roy, Kashif Hasan Kazmi, Prakash Kumar, **Sumanta Mukherjee**; Materials Today: Proceedings, doi: 10.1016/j.matpr.2021.09.384

10. A Review on Friction Stir Welding—A Green Manufacturing Technology (2021) M Mofeed Alam, AK Jha, **S Mukherjee**, S Panda, SS Chakraborty; In: Osman Zahid M.N., Abdul Sani A.S., Mohamad Yasin M.R., Ismail Z., Che Lah N.A., Mohd Turan F. (eds) Recent Trends in Manufacturing and Materials Towards Industry 4.0. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-9505-9_76

11. Ductility Improvement in Commercially Pure Aluminium by Friction Stir Processing (2021) AK Jha, MM Alam, SS Chakraborty, KH Kazmi, P Kumar, **S Mukherjee**; In: Bag S., Paul C.P., Baruah M. (eds) Next Generation Materials and Processing Technologies. Springer Proceedings in Materials, vol 9. Springer, Singapore. https://doi.org/10.1007/978-981-16-0182-8_3

12. Electrohydrodynamic jet printing for desired print diameter (2021) MH Saba, **S Mukherjee**, S Dutta, PK Mallisetty, and NC Murmu; Materials Today: Proceedings 46, 1749-1754

13. Analysis and optimization of geometry of 3D printer part cooling fan duct (2021) M Choudhary, S Mukherjee, P Kumar; Materials Today: Proceedings

14. Trends and future scopes in application of artificial intelligence in steelmaking: Insights from the scientometric and bibliometric analysis (2021) Sumanta Mukherjee, Kashif Hasan Kazmi, Prakash Kumar; International Conference on "Digital Transformation in Steel Manufacturing – 2021" (DtSM'21), IISCO-SAIL Burnpur

Research Interests

- ✓ Additive manufacturing for biomedical applications
- ✓ Surface modification for biomedical applications
- ✓ Process monitoring for additive manufacturing

Relevant Skills and Expertise

- ✓ CAD Software (SolidWorks)
- ✓ 3D Medical Image Processing Software (Materialise Mimics, Simpleware ScanIP, ImageJ)
- ✓ 3D Mesh Editing and Data Preparation tools (Materialise Magics, Autodesk Netfabb, MeshLab)
- ✓ Laser Powder Bed Fusion system (EOS DMLS M270)
- ✓ Fused Deposition Modeling systems (Prusa Mk3s, Prusa Mini+, Stratasys F200, Pramaan HT300)
- ✓ Stereolithography systems (Prusa SL1, Formlabs Form 2)
- ✓ Mechanical, microstructural, electrochemical, and tribological characterization

Honors and Awards

- ✓ Awarded institute fellowship for M Tech in IIT Kharagpur (2008-10)
- ✓ Awarded institute fellowship for PhD in IIT Kharagpur (2010-15)
- ✓ Qualified in Graduate Aptitude Test in Engineering (GATE) in 2008 with All India Rank 17 in Production and Industrial Engineering (98.54 percentile)

Students Supervision

- M. Tech: 8 completed and 2 Ongoing

Sponsored ResearchProject (as PI)

S. No.	Title ofProject	Amount	Funding agency	Duration
1.	Development of 3D Printed User-specific Assistive Devices for Persons with Disabilities in India	INR12,63,000/- (ca. USD 17,000)	NPIU-MHRD (Govt. of India)	July '18– July '19

Teaching Experience

- Assistant Professor (TEQIP III) in the Production Engineering Department, BIT Sindri, Dhanbad, Jharkhand, from Sept. '18 - Continuing
- Assistant Professor (TEQIP III) in the Production Engineering Department, IGIT Sarang, Sarang, Odisha, from Jan. '18 to Aug. '18
- Ad Hoc Faculty, Manufacturing Engineering Department from Jan. '16 to Sept. '17