

Dr. Abhijeet Sethi

DST Inspire Faculty, Department of Mechanical Engineering, IIT (ISM) Dhanbad

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Career Objective: To contribute to cutting-edge research and academic excellence as a faculty member, leveraging my expertise in advanced manufacturing and micro/nano fabrication, while fostering innovation and knowledge transfer.

Research Interests: Electropolishing of Additively Manufactured Components, Micro and Nano fabrication, Surface engineering, Electrochemistry and Corrosion science, Smart materials machining and application.

Work Experience

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|  DST Inspire Faculty , Department of Mechanical Engineering,
Indian Institute of Technology (Indian School of Mines) Dhanbad, India | 18 th June 2024 –
Present |
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Academic Qualifications

Ph.D., Department of Mechanical Engineering, IIT Kharagpur, India, (2023)

-  **Topic:** Experimental Investigation on Electrochemical Micromachining of Nitinol Shape Memory Alloy
-  **Supervisor:** Prof. Partha Saha, IIT Kharagpur

M. Tech., Department of Mechanical Engineering, IIT(ISM) Dhanbad, India, (2016)

-  **Topic:** Evaluation of Surface Integrity of The Features Machined Through Ultrasonic Vibration-Assisted Micro-EDM Process
-  **Supervisor:** Prof. Alok Kumar Das, IIT(ISM) Dhanbad
-  Aggregate CGPA in M. Tech: 9.42/10

B.Tech., Mechanical Engineering, Siksha 'O' Anusandhan University, Bhubaneswar, Odisha, India, (2012)

-  Aggregate CGPA: 7.80/10

12th Standard, CHSE Board, D.D. Junior College, Kendujhar, Odisha, India, (2006) Percentage: 74.4%

10th Standard, BSE Board, N. S. Police High School, Kendujhar, Odisha, India, (2004) Percentage: 82.6%

Research Contributions

-  **13 Journal Publications in a reputed journals including 5 Publications as a First Author**
-  **4 Conference Proceedings**
-  **2 Book Chapters**
-  **Citations: 210, h-index: 5, i-10 index: 3**

Ongoing Projects

DST Sponsored Project: Precision Electrochemical Polishing (EP) of Additively Manufactured Components.
(2024-2029)

Role: Principal Investigator (PI) DST Inspire Faculty Award 2024

Sponsoring Agency: Department of Science and Technology (DST), **Amount:** INR 35 Lakh

Current Research Activities

-  Post processing of Additive Manufacturing
-  Micromachining of Advanced Materials
-  Laser Based Additive Manufacturing

Achievements

- 🏆 **DST Inspire Faculty Fellowship Award** 2024 by Ministry of Science and Technology, Government of India.
- 🏆 Recipient of financial support for presenting paper at 12th European Congress of Chemical Engineering (ECCE12), Florence, Italy in 2019 from IIT Kharagpur, India

Courses Taught

- 🏆 **At IIT (ISM) Dhanbad:** Engineering Mechanics (Theory), Engineering Mechanics (Practical)
- 🏆 **As a Teaching Assistant:** Manufacturing Science

Publications

Journals:

1. **Sethi, Abhijeet**, Ipsita Mohanty, Saurav Misra, Rajib Chakraborty, and Partha Saha. "A study integrating in-process thermal signatures, microstructure, and corrosion behaviour of AISI 316L coatings on low carbon steel substrate deposited by laser-directed energy deposition (L-DED)." **Surface and Coatings Technology** 493 (2024): 131268.
2. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, and Partha Saha. "Real-time monitoring of process current and its correlation with micro-feature accuracy and surface topography in electrochemical micromachining of nitinol." **Engineering Research Express** 5, no. 4 (2023): 045056.
3. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, and Partha Saha. "Parametric Investigation of Pulse Frequency and Microtool Rotational Speed for Precise Fabrication of Microchannels on Nitinol Shape Memory Alloy through ECMM." **Materials Today Communications** (2023): 106844.
4. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, and Partha Saha. "Electrochemical dissolution of WC-Co micro-tool in micro-WECM using an Eco-friendly citric acid mixed NaNO₃ electrolyte." **Journal of The Electrochemical Society** 169.3 (2022): 033503.
5. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, and Partha Saha. "Study of the electrochemical dissolution behavior of Nitinol shape memory alloy in different electrolytes for micro-ECM process." **The International Journal of Advanced Manufacturing Technology** 121.9-10 (2022): 7019-7035.
6. Kundu, Joydeep, **Abhijeet Sethi**, Santosh Mandal, and Partha Saha. "Heterogeneous adhesive bonding between different CFRPs and Al 7075 after different surface treatments: A study on the selective practical applicability of the resin pre-coating (RPC) technique." **Polymer Composites** (2025).
7. Acharya, Biswesh Ranjan, **Abhijeet Sethi**, Amit Kumar Das, Partha Saha, and Dilip Kumar Pratihari. "Parametric optimization of micro-tool fabrication through sheet-EDG using nature-inspired algorithms." **Journal of the Brazilian Society of Mechanical Sciences and Engineering** 46, no. 2 (2024): 72.
8. Acharya, Biswesh Ranjan, **Abhijeet Sethi**, Partha Saha, and Dilip Kumar Pratihari. "High aspect ratio shaped microtool fabrication using sheet-EDG." **Materials and Manufacturing Processes** (2023): 1-13.
9. Acharya, Biswesh Ranjan, **Abhijeet Sethi**, Amit Kumar Das, Partha Saha, and Dilip Kumar Pratihari. "Multi-objective optimization in electrochemical micro-drilling of Ti6Al4V using nature-inspired techniques." **Materials and Manufacturing Processes** (2023): 1-13.
10. Rao, Shivdayal, **Abhijeet Sethi**, Alok Kumar Das, Niladri Mandal, P. Kiran, Rizul Ghosh, A. R. Dixit, and A. Mandal. "Fiber laser cutting of CFRP composites and process optimization through response surface methodology." **Materials and Manufacturing Processes** 32, no. 14 (2017): 1612-1621.
11. Rao B, Shiva Dayal, **Abhijeet Sethi**, and Alok Kumar Das. "Fiber laser processing of GFRP composites and multi-objective optimization of the process using response surface methodology." **Journal of Composite Materials** 53.11 (2019): 1459-1473.
12. Sethi, Jamuna, Sudipta Mohapatra, **Abhijeet Sethi**, Siddhartha Das, and Karabi Das. "A Study on the Tribological Properties of Al-AlN-Y 2 W 3 O 12 Hybrid Composites." **Journal of Materials Engineering and Performance** 29 (2020): 5638-5654.
13. Das, Alok Kumar, Pankaj Kumar, **A. Sethi**, P. K. Singh, and M. Hussain. "Influence of process parameters on the surface integrity of micro-holes of SS304 obtained by micro-EDM." **Journal of the Brazilian Society of Mechanical Sciences and Engineering** 38 (2016): 2029-2037.

Conferences Proceedings:

1. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, and Partha Saha. "Fabrication of high aspect ratio cylindrical tungsten micro tool by reverse micro-ECM process." *International Journal of Precision Technology* 8.2-4 (2019): 201-219.
2. Acharya, B. R., **A. Sethi**, P. Saha, and D. K. Pratihari. "A comparative study of micro-tool fabrication methods using micro-EDM." In *Proceedings of 10th International Conference on Precision, Meso, Micro and Nano Engineering (COPEN 10)*, Indian Institute of Technology Madras, Chennai, India, pp. 210-213. 2017.
3. **Sethi, Abhijeet**, Deepak Kumar, Pankaj Kumar, and Alok Kumar Das. "The effect of ultra sonic vibration on the surface integrity of SS304 micro holes drilled by micro EDM." In *Proceedings of International Conference On Advances in Dynamics, Vibration and Control (ICADVC-2016)* 25th -27th February 2016, National Institute of Technology Durgapur, West Bengal, India.
4. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, and Partha Saha. "Electrochemical dissolution behavior of WC-Co in different electrolytes during micro wire-electrochemical machining". Poster presentation in *The 12th European Congress of Chemical Engineering (ECCE12)*, September, 2019, Florence, Italy.

Book Chapters:

1. **Sethi, Abhijeet**, Biswesh Ranjan Acharya, Pranai Kumar, Rajib Chakraborty, and Partha Saha. "Realization of Green Manufacturing Using Citric Acid Electrolyte for WC-Co Alloy Micro-tool Fabrication in Micro-WECDM." In *Advances in Unconventional Machining and Composites: Proceedings of AIMTDR 2018*, pp. 211-223. Singapore: Springer Singapore, 2019.
2. Acharya, Biswesh Ranjan, **Abhijeet Sethi**, Akhil Dindigala, Partha Saha, and Dilip Kumar Pratihari. "A Study on Micro-tool and Micro-feature Fabrication in Micro-EDM." In *Advances in Unconventional Machining and Composites: Proceedings of AIMTDR 2018*, pp. 191-202. Singapore: Springer Singapore, 2019.