



## Samir Das

**Prime Minister Research Fellow, IIT Kharagpur Kharagpur 721302**

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Sincere and dedicated Research Scholar at the School of Medical Science and Technology (SMST), IIT Kharagpur, driven to develop customized and scalable devices for biofabrication through the integration of finite element analysis and biomechanics.

## Education

Year of passing	Degree/Exam	Institute	Marks(%)
2025	PhD	IIT Kharagpur	Thesis Submitted
2020	Biomedical Engineering	IEST Shibpur	77.70
2016	Mechanical Engineering	Kalyani Govt. Engg. College	79.30
2011	Higher Secondary	W.B.C.H.S.E.	85.00
2009	Secondary	W.B.B.S.E.	86.00

## Awards and Achievements

- ✓ Qualified GATE with 89.67 percentile in 2018, along with WBJEE with 98.72 percentile, and AIEEE with 96.28 percentile in 2012.
- ✓ Best idea pitching in Innovation, Design and Entrepreneurship (IDE) Bootcamp 2023, organised by the Ministry of Education's innovation cell (MIC) & All India Council for Technical Education (AICTE) at the Indian Institute of Technology Bhubaneswar.
- ✓ Best patent work in INTER IIT TECH MEET 14.0 in 2025.

## Work Experience

2012-2014	Trainee at M.S.M.E. Tool Room, Kolkata, specializing in CAD/CAM design, CNC/ANSYS-based numerical programming.
2016	Intern at WPIL Limited, Kolkata, specialising in pumping operations.
2016-2018	Design engineer at FABRICATOR PVT. LTD with CIN No.L36900WB1952PLC020274.
2021-2024	Certifications in teaching assistantship at various academic sectors, i.e. IIT Kharagpur, IEST Shibpur, Hijli College and schools.
2021-2024	Work under ICMR-funded Project, "Bioprinting of skeletal tissue towards customized Phalanx reconstruction and regeneration Using AI-based tissue engineering approach". (ICMR Grant No: _2020-4833)
2024-till now	Currently working on ICMR-DHR-CoE, IIT Kharagpur-funded project, "On-site deployable ultrathin dressing by hand-held device for bed sore application".

## Technical Skills and Expertise

3D printing, CAD/CAM programming, Powder Metallurgy, Rapid prototyping, *In vitro* and *In vivo* bioassays, Micro-CT, Piezoelectric devices for biomedical engineering, Artificial Intelligence-based mechanical simulation.



## Position and Responsibilities

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- ✓ Life-time member at STERMI &SBAOI, India, with membership ID LM189 and LM 870, respectively.
- ✓ Technical and Academic Secretary at SMST council, IIT kharagpur from 2021 to 2023.
- ✓ Student Secretary at the Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) of KGECE Chapter in 2016.



## Publications

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### ❖ Patents

1. **Das, S.,** Jana, S., & Dhara, S. 3D printed bioactive glass reinforced magnesium as bone analogue and application thereof. Indian Patent Application No. 202431037314 dated 11-05-2024 under Section 11A(2) of the Act.
2. **Das, S.,** Saha, B., & Dhara, S. Skin and bone decellularized extracellular matrix incorporated bone analogues towards theragnostics application thereof. Indian Patent Application No. 202431062959 dated 11-05-2024 under Section 11A(2) of the Act.
3. Roy, T., **Das, S.,** Chattopadhyay S, & Dhara, S. 3D PRINTED STENT-GRAFT. Indian Patent Application No. 202431049131 dated 26-06-2024 under Section 11A(2) of the Act.
4. **Das, S.,** Kashyap Das N, & Dhara, S. A facile System and Method for melt-electro-writing of ultrathin fibrous 3D scaffold and tubular graft. Indian Patent Application No. 202431073007 dated 27-09-2024 under Section 11A(2) of the Act.
5. **Das, S.,** Sukla, Aman, & Dhara, S. High-strength machinable bioactive magnesium composite via powder metallurgy route and application thereof. Provisional Application No. 202531018228 dated 01-03-2025 under Section 11A(2) of the Act.

### ❖ SCI-Journals

1. **Das, Samir,** et al. "Bioresorbable-bioactive auxetic "personalised" phalanx with a CT-guided AI-driven model towards in vivo prediction of bone regeneration." *Biomaterials Science* (2026).
2. **Das, Samir,** Amit Roy Chowdhury, and Pallab Datta. "Modelling cell deformations in bioprinting process using a multicompartement-smooth particle hydrodynamics approach." *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine* 236.6 (2022): 867-881.
3. **Das, Samir,** et al. "Mechano-stimuli-responsive engineered device mimicking native anisotropy towards tissue regeneration." *RSC Sustainability* (2026).
4. Dhara Santanu, Sri Medha Juloori\*, **Samir Das\***, Partha Sarathi Mandal, and Manish Pal Chowdhury. "Ethically sourced biotemplate engineered with smart polymer for promoting skeletal tissue regeneration." *MRS Communications* (2025): 1-10.
5. Swarnakar, M., Mandal, P.S., **Das, S.,** Dhara, S. and Chowdhury, M.P., 2026. Conduction pathways and sensing mechanism in highly sensitive PANI-ZnFe<sub>2</sub>O<sub>4</sub> nanocomposite impedimetric ammonia sensors: Role of bias frequency and quantum tunneling effects. *Chemical Engineering Journal*, p.172684.
6. Sundeep, C, Partha S., **Das, S.,** Soham C., Manush P.C., Barui, A, Dhara, S., Sabdipan R., & Roy Choudhury, A., (2026). Micro-CT-assisted finite element analysis and functionalization of dental implants with piezoelectric coatings for improved biomechanical and antibacterial performance. *Journal of the Mechanical Behavior of Biomedical Materials*.

7. Ganguly, R., **Das, S.**, Sussela, S. V., Vaidya, P. V., Dogra, N., Pal, T. K., ... & Dhara, S. (2025). Porous Ti6Al4V with controlled oxidation toward improved osseointegration of dental implant. *Journal of Indian Society of Periodontology*, 29(5), 537-547.
8. Dadhich Prabhash, Pallabi Pal, Nantu Dogra, Pavan K. Srivas, Bodhisatwa Das, **Samir Das**, Pallab Datta, Baisakhee Saha, Bo Su, and Santanu Dhara. "Calcium Phosphate Apatite Filament Co-Wrapped With Perforated Electrospun Sheet of Phosphorylated Chitosan—A Bioinspired Approach Toward Bone Graft Substitute." *Journal of Biomedical Materials Research Part B: Applied Biomaterials* 113, no. 5 (2025): e35589.
9. Mukundan, L. M., Rajasekaran, R., **Das, S.**, Seesala, V. S., Ganguly, D., Kumar, N., ... & Chattopadhyay, S. (2025). Tailoring of agarose hydrogel to modulate its 3D bioprintability and mechanical properties for stem cell mediated bone tissue engineering. *International Journal of Biological Macromolecules*, 309, 142795.
10. Jana, Subhodeep, Rajdeep Sarkar, Masud Rana, **Samir Das**, Agniswar Chakraborty, Apurba Das, Amit Roy Chowdhury, Bidyut Pal, Jyotsna Dutta Majumder, and Santanu Dhara. "A Biomimetic Titanium Scaffold With and Without Magnesium Filled for Adjustable Patient-Specific Elastic Modulus." *Journal of Biomechanical Engineering* 147, no. 9 (2025): 091010.
11. Ojha, A.K., Rajasekaran, R., Hansda, A.K., Singh, A., Dutta, A., Seesala, V.S., **Das, S.**, Dogra, N., Sharma, S., Goswami, R. and Chaudhury, K., 2023. Biodegradable multi-layered silk fibroin-PCL stent for the management of cervical atresia: in vitro cytocompatibility and extracellular matrix remodeling in vivo. *ACS Applied Materials & Interfaces*, 15(33), pp.39099-39116.
12. Mukundan, L. M., **Das, S.**, Rajasekaran, R., Ganguly, D., Seesala, V. S., Dhara, S., & Chattopadhyay, S. (2024). Photo-annealable agarose microgels for jammed microgel printing: Transforming thermogelling hydrogel to a functional bioink. *International Journal of Biological Macromolecules*, 278, 134550.
13. Das, S, Seesala S, Dhara S, 2025. "Dough Extrusion 3D Printing of Bioglass with Physico-mechanical and biological assessments for Bone Tissue Engineering", *International Journal of Applied Glass Science*, under American Ceramic Society, Wiley.

#### ❖ Book Chapters

1. **Das, Samir**, Mitali Mishra, Kanta Chakraborty, Sayan Das, Baisakhee Saha, and Santanu Dhara. "Synthetic Bone Analogue Materials and Design for Skeletal Tissue Healing." In *Emerging Materials and Technologies for Bone Repair and Regeneration*, pp. 39-63. CRC Press, 2024.
2. **Das, Samir**, Pallab Datta, and Amit Roy Chowdhury. "Optimizing Cell Deformation in Extrusion-Based Bioprinting Process by Importing Inherent Viscoelasticity Using Computational Fluid Dynamic." *Recent Advances in Computational and Experimental Mechanics, Vol—I: Select Proceedings of ICRAEM 2020*. Singapore: Springer Singapore, 2022. 337-348.



1. Das, S., Datta, P., & A. Roy C. (2020). Optimizing cell deformation in extrusion-based bioprinting process by importing inherent viscoelasticity using computational fluid dynamics. Oral presentation at the International Conference on Recent Advances in Computational and Experimental Mechanics, 04–06 September 2020, IIT Kharagpur, India. (Talk)
2. Das, S.<sup>1</sup>, Jana, S.<sup>2</sup>, & Dhara, S. (2022). Three-dimensional amorphous bioactive glass scaffold and its in-vitro study analysis. Oral presentation at the International Conference on BIO-REMIDI 2022, organized by STERMI, IIT Guwahati, India. (Talk)

3. Das, S.<sup>1</sup>, Dogra, N.<sup>1</sup>, & Dhara, S.<sup>1</sup> (2023). Bioceramic-based 3D printed tissue analogues and its bioassay towards affordable healthcare. Oral presentation at the International Conference of the European Society for Biomaterials (ESB 2023), Davos, Switzerland, 4–8 September 2023.(Poster)
4. Das, S. (2023). Synthesis and characterization of bioactive glass-ceramics microparticles and their bioassay. Oral presentation at the 7th Euro BioMAT 2023-European Symposium on Biomaterials and Related Areas. Indian Institute of Technology Kharagpur.Certificates of participation in MANIPAL BIOTECH HACKATHON 2024.(Speaker)
5. Das, S.<sup>1</sup> & Dhara, S.<sup>1\*</sup> (2025). Engineering and evaluation of porous bioactive glass scaffolds for bone tissue engineering via powder metallurgy route. Oral presentation at the International Congress on Glass (ICG 2025), 20–24 January 2025.(Poster)
6. Das, S., Mondal, S., & Mukherjee, S. (2016). CFD analysis of corrosion resistance in bridge piers. Oral presentation at the 8th International & 47th National Conference on Fluid Mechanics and Fluid Power (FMFP 2016), MNIT Allahabad, India. (Talk)
7. Das, S., Jana, S., & Dhara, S. (2023). Bioglass–magnesium composite via powder metallurgy and its bioassay. Best Poster Award at the International Conference on Processing of Composite Materials (ICPCM 2023), NIT Rourkela, India.(Poster)

## Languages

English



Upper

Bengali



Upper intermediate

Hindi



Intermediate



## Thesis Submitted

- ✓ B.Tech. thesis submitted on “CFD Analysis on Preventing Bridge Piers” in 2016.
- ✓ M.Tech. thesis submitted on “Modeling Cell Deformations in the Bioprinting Process Using a Multicomponent Smooth Particle Hydrodynamics Approach” in 2020.
- ✓ Ph.D. thesis submitted on “3D-Printed Customized Hybrid with Bioactive Cues: A Semi-Synthetic Functional Tissue Analogue” in 2025.



## References

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<sup>2</sup>

## Declaration

I hereby declare that the above-mentioned information is true to the best of my knowledge, and I will be able to provide the necessary documents whenever required.

Date: 10.02.2026

Place: IIT Kharagpur, Kharagpur

*Samir Das*  
(Signature)

**Samir Das**