

# Satarupa Biswas, Ph.D

Assistant Professor

Location: Kolkata, India

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## Summary

- Biomedical Engineer with research experience on Neural Rehabilitation, AI/ML application in image analysis, Biomedical Simulations, Biomedical Signal Processing and Biostatistics, in-vitro animal studies.
- Working as an Assistant Professor at the Department of Physics, Adamas University
- With my technical skills like simulation, designing and fabrication, in vitro animal studies, statistical analysis of large data set along with my analytical thinking and problem solving skills, I would like to contribute to the interdisciplinary field of study for translational research through cutting-edge technologies.

## Education

- 2012–2019 **Ph.D Biomedical Engineering**, *Indian Institute of Technology Kharagpur*, Kharagpur.  
**Thesis Title** - In-Vitro Stimulation of Isolated Retina with Flexible Multielectrode Array for Epiretinal Prosthesis.
- 2009–2011 **M.Tech, Biomedical Engineering**, *Jadavpur University*, Kolkata, *CGPA: 8.61/10*.  
**Dissertation** - Microstructural and Micromechanical Performance of Human Femur: An attempt to correlate the structural features with the mechanical behavior of bone.
- 2005–2009 **B.Tech, Biomedical Engineering**, *West Bengal University of Technology*, Kolkata, *CGPA: 8.45/10*.  
**Project** - Heart Rate Variability analysis among the tea garden workers of northern hilly regions of West Bengal.

## Areas of Professional Interest

Medical Instrumentation, Biomedical Signals and Image processing, Biosensors, Clinical Data Analysis, Data Automation and validation

## Awards

**Best Paper Award** for the paper titled “Photo-electric Characteristics Analysis of Quantum Corrected Strained Nanowire Drift-Diffusion Model based  $Si/Si_{0.98}C_{0.02}$  Asymmetrical Super-lattice Near Infrared Photo-detector” for oral presentation in 4th IEEE International Conference on Computing and Communication Systems (I3CS), 2023, NEHU, Shillong, India.

**Best Paper Award** for the paper titled “Entropy of DNA Sequences as Similarity Index for Various SARS-CoV-2 Virus Strains” for oral presentation in AMPHE 2020, Adamas University, Kolkata, India.

**Institute Research Fellowship** (MHRD fellowship) for Ph.D programme.

**Best student paper award** for the paper titled “Simulation of electrode-tissue interface with biphasic pulse train for epi-retinal prosthesis” for oral presentation in COMSOL Conference Bangalore 2013, India.

Selected for **National Scholarship Scheme** in Madhyamik(2003) from Education Department, Govt. of West Bengal.

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## Experience

2019-present **Assistant Professor**, Department of Physics, School of Basic and Applied Sciences, Adamas University, Barasat, West Bengal, India.

**Job responsibilities include:**

- Teaching theory and Laboratory papers to M.Sc. (Tech) in Medical Physics and Instrumentation, M.Sc. Physics with Bioinstrumentation as specialization, and B.Tech (CSE) batches.
- Supervision of Dissertation of post graduate and doctoral students in Department of Physics and Doctoral Committee Member of Ph.D. student
- Program Coordinator of newly introduced AERB approved Post M.Sc. Diploma in Medical Physics.
- Managing student and faculty database in ERP system (TCSiON) for timetable and grading system of Department of Physics.
- Designing online courses using CANVAS as the LMS system
- Operating as placement coordinator and NAAC criteria coordinator for School of Basic and Applied Sciences.
- Organizing seminars, webinars, conferences and other academic events for Department of Physics.

2016-2017 **Teaching Assistant**, Advanced Technology Development Centre, Indian Institute of Technology Kharagpur, Kharagpur.

**Responsibilities included:**

- Demonstrating Laboratory experiments to students.
- Supervising summer interns and Masters students.
- Semester Examination invigilation and evaluation.

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## Publications

Journal A Das, A Ray, J Mukhopadhyay, M Mukherjee, **S Biswas** and M Mukhopadhyay. "An Account on Functional Polymer Composite for Multivariant Application: A Mechanistic Approach". Journal of Physics: Conference Series. Vol. 2349. No. 1. IOP Publishing, 2022.

**S Biswas**, D Sikdar, D Das, M Mahadevappa, S Das, "PDMS based multielectrode arrays for superior in-vitro retinal stimulation and recording.", *Biomedical Microdevices*, 19 (4), 75, 2017.

**S Biswas**, S Das, M Mahadevappa, "Design of electrode configuration for in vitro experiments of epiretinal electrical stimulation of retinal ganglion cells.", *IET Science, Measurement and Technology*, 2017 doi: 10.1049/iet-smt.2016.0315.

**S Biswas**, P Dasgupta, P Pramanik, A Chanda, "Macro and Micro-indentation behavior of the cortical part of human femur.", *Procedia Materials Science*, Vol 5 pp 2320-2329, 2014.

**S Biswas**, P Dasgupta, P Pramanik, A Chanda, "Study of Microstructure and Mechanical Properties of Human Cortical Bone.", *International Journal of Scientific and Engineering Research*, Vol 2: Issue 3, 2010.

Book Chapter **S Biswas** and M Mukherjee. "3D Biosensors in Medical Diagnostics Current Status and Future Trends", *The Role of 3D Printing for the Growth and Progress of Medical Healthcare Technology*. Cambridge Scholars Publishing, United Kingdom, 2022. 145-168.

**S Biswas** and BK Sarkar. "Entropy of DNA Sequences as Similarity Index for Various SARS-CoV-2 Virus Strains", *Advances in Medical Physics and Healthcare Engineering*. Springer, Singapore, 2021. 533-543.

Conference P Sardar, **S Biswas**, M Mukherjee, P. Sardar, S. Biswas, D. Bhatia and M. Mukherjee, "AI Based approaches for identification of COVID and non-COVID Pneumonia," 2023 4th International Conference on Computing and Communication Systems (I3CS), Shillong, India, 2023, pp. 1-6, doi: 10.1109/I3CS58314.2023.10127435.

Bianchetti, G., **Biswas, S.**, Sikdar, D., Mahadevappa, M. Characterization of Goat's retinal ganglion cells firing patterns evoked by pulses of different wavelengths and widths through the evaluation of inherent features for stimulus-response mapping between light and electrical stimulation parameters. Abstract presented in Neuroscience 2018, Annual Meeting of Society for Neuroscience, 3-7 November, 2018, San Diego, CA, USA.

**S Biswas**, D Sikdar, S Das and M Mahadevappa, "Discriminating Color Responses in Retina through Multielectrode Array Recordings.", *IEEE Sensors 2018 Conference*, New Delhi, India from October 28-31 October, 2018, New Delhi, India. DOI:10.1109/ICSENS.2018.8589756

**S Biswas**, D Sikdar, S Das and M Mahadevappa, "A Comparative Study of Light and Electrically Evoked Response of Retinal Ganglion Cells.", *39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'17)*, 11th-15th July 2017, Jeju, South Korea, pp. 1101-1104, doi: 10.1109/EMBC.2017.8037020

**S Biswas**, D Das, M Mahadevappa and S Das, "Characterization of Retinal Tissue and Vitreous Humor with Electrical Impedance Spectroscopy.", *8th International IEEE EMBS Conference on Neural Engineering*, May 25-28, 2017, Shanghai, China, pp. 190-193, doi: 10.1109/NER.2017.8008323

**S Biswas**, S Das, M Mahadevappa, "Simulation of Electrode-Tissue Interface for Electrical Stimulation of Retinal Ganglion Cells.", *IEEE International Conference on Electronics, Computing and Communication Technologies (IEEE CONECCT)*, 6-7 Jan 2014, IISc Bangalore, India, pp. 1-5, doi: 10.1109/CONECCT.2014.6740341

**S Biswas**, S Das, M Mahadevappa, "Simulation of Electrode-Tissue Interface with Biphasic Pulse Train for Epiretinal Prosthesis.", *COMSOL Conference Bangalore 2013*, October 17-18, 2013, Bangalore, India.

**S Biswas**, P Bhattacharjee, K DasGupta, A Chanda, "Micro-mechanical characteristics of human bone: A pre-requisite for Customized Implant Designing.", *International Conference on Mechanical Engineering (ICME 2011)*, December 18-20, 2011 Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

**S Biswas**, P Dasgupta, P Pramanik, A Chanda, "Fracture and Deformation of human cortical bone: Micro-mechanical feature.", *13th Annual Paper Meet. Mechanical Engineering Division, IEB*, 2010 Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

**S Biswas**, A. Chanda, "Gender Based Properties of Human Femur: An Essential Criteria for Implant Designing.", *International Conference on "Biomaterials and Implants: Prospects and Possibilities in the New Millennium" (BIO 2011)* July 21-23, 2011, Central Glass and Ceramic Research Institute, Kolkata, India.

**S Biswas**, P Dasgupta, P Pramanik, A Chanda, "A Comparative Study of Microstructure and Mechanical Properties of Human Cortical Bone.", *International Conference on Systems in Medicine and Biology (ICSMB 2010)*, December 16-18, 2010, Indian Institute of Technology Kharagpur, India.

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## Training Experience

March, 2023 14 Days Refresher Course in Biomedical organized by UGC-HRDC, NEHU Shillong, India

- June, 2022 Short Term Training Programme through ICT Mode on Assessment and Evaluation from National Institute of Technical Teachers' Training & Research (NITTTR), Kolkata.
- May, 2022 Short Term Training Programme through ICT Mode on Writing Research Proposal from National Institute of Technical Teachers' Training & Research (NITTTR), Kolkata.
- April-May, 2020 Online Coursera Courses: Healthcare Organizations and the Health System offered by Rutgers University, A Guide to Healthcare Innovation: Principles and Practice offered by Imperial College London, Biohacking Your Brain's Health offered by Emory University, Neural Networks and Deep Learning offered by Prof. Andrew Ng.
- May, 2020 Six Day Faculty Development Program on E-Learning and Development in Digital Era, Department of Management, School of Business and Economics, Adamas University.
- May, 2014 INUP Familiarization Workshop on Nanofabrication Technologies, CEN, IIT Bombay, India.
- July 2013 Workshop Program on Tools for In-vivo and In-vitro Cardiovascular Research conducted by AD Instruments, Department of Physiology, University College of Science, Technology & Agriculture, Calcutta University, Kolkata.
- July 2012 IEEE workshop on Medical Imaging and Image Processing, Indian Institute of Technology, Kharagpur.
- May, 2011 Short Term Course on Scanning Electron Microscopy for Beginners. M.N.Dastur School of Materials Science and Engineering, IEST, Shibpur.
- August, 2008 Trainee at Dept. of Biomedical Engineering, Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata.
- July, 2008 Medical Equipments, BPL Electro care Services, Kolkata.
- July, 2007 Basics of Medical Equipment and Hospital Management Software, BPL Electro care Services, Kolkata.
- Feb-Sep, 2007 C and Data Structure, CMC Limited, Siliguri.

## Skills

- Softwares** COMSOL, MATLAB, PYTHON, AUTOCAD, ORIGIN, COREL DRAW, familiarity with C and Data Structure.
- Laboratory** Micro-electrostimulation, electrophysiological recordings and signal processing, Animal dissection and isolation of tissue, Clean room equipments for lithography, Sputtering, Plasma etching, wet-lab instrument handling.
- Characterization** Electrical Impedance Spectroscopy, Optical microscopy, Optical Coherence Tomography, Scanning Electron Microscopy, Microindentation, Universal Testing Machine.
- Organizational** Planning and organizing conferences, workshops, webinars and social events, Placement Coordinator, Program coordinator
- Mentoring** Supervision of one Doctoral student.  
Mentoring Post Graduate students for dissertation work, undergraduate students for Inter-disciplinary Project, national and international students for summer internship.

## Professional Activities

**IEEE Professional Member** since 2019

- Editor** Advances in Medical Physics and Healthcare Engineering. Springer, Singapore, 2021.
- Convener** Cancer 2022, 1st International Cancer Congress 2022, organised jointly by Adamas University and Netaji Subhash Chandra Bose Cancer Research Centre, Kolkata *March 6-7, 2022*
- Convener** A Week-Long Faculty Development Programme on Data Analytics for Basic and Applied Sciences, Organized by School of Basic and Applied Sciences, Adamas University *June 14-20, 2021*

- Treasurer** 3rd National Conference on Frontiers in Modern Physics (NCFMP 2021), Organised by Department of Physics, Adamas University, Kolkata *November 26-27, 2021*
- Organising Secretary** IEEE Advances in Medical Physics and Healthcare Engineering (AMPHE 2020), Organised by Department of Physics (in Collaboration with the School of Engineering and Technology) Adamas University, Kolkata, in TECHNICAL CO-SPONSORSHIP with IEEE – Kolkata Section. *September 25-26, 2020*
- IEEE Student Member** 2012-2019
- Chair** IEEE EMBS (Engineering in Medicine and Biology Society) Student Branch, Kharagpur Section, *April 2015 to March 2016.*
- Secretary** IEEE EMBS (Engineering in Medicine and Biology Society) Student Branch, Kharagpur Section, *April 2014 to March 2015.*
- Vice-chair** IEEE WIE (Women in Engineering) Affinity group of Student Branch, Kharagpur section, *April 2013 to March 2014.*
- Organizing committee member** IEEE Students' Technology Symposium (Techsym) 2014 at IIT Kharagpur, *28 February to 2 March, 2014* and IEEE Workshop on MEMS and Microsystems with Hands-on training in Device Simulation and Microfabrication Process, IIT Kharagpur, *July 4-6, 2013.*