Dr. Bed Prakash Das, PhD

Postdoctoral Research Fellow,
School of Electronics and Computer Science, University of Southampton, United Kingdom
Phone: +44-7587754462 || Email: bedprakash.ice@gmail.com
LinkedIn: https://www.linkedin.com/in/bed-prakash-das/
ORCID: https://orcid.org/0000- 0002-5025-1997
UK Global Talent Visa Holder (since 18 September 2024, valid until 20 October 2026)

Professional Summary

Postdoctoral Research Fellow in the School of Electronics and Computer Science (ECS), University of Southampton, specializing in Artificial Intelligence and Machine Learning for Computational Neuroscience. Proven experience in Kalman filter design, AI-driven estimation frameworks, and interdisciplinary collaboration across biomedical systems and intelligent computing through the European Horizon Project ETHEREAL. Over 8+ years of experience in teaching UG and PG level and 6+ years of research expertise includes EEG and fNIRS signal processing, brain connectivity estimation, and neural data modelling. Consistent record of peer reviewed publications in IEEE Transactions and journals in computational modelling. Experience supervising students, delivering research led teaching, and supporting interdisciplinary projects. Prepared to contribute to teaching, research outputs, and grant development in a UK academic setting.

Research Interests

- **AI / ML Applications:** Autonomous Systems, Intelligent Control, Bio-medical data (Mental health, Metabolomic, DAWBA, Psychometric measurements), Deep Learning, Optimization, Regression, Classification, Intelligent Systems, Causal AI modelling (Granger Causality, DTF, PDC, SURD).
- **Control & Estimation**: Control Systems, Kalman Filter, Linear and Nonlinear System Estimation, State Estimation, Embedded Intelligent Systems
- **Signal Processing**: Sensors, Signal Processing, EEG/fNIRS Preprocessing and multi modal integration, Feature Extraction, Data Analytics, MATLAB, Python (NumPy, Pandas, Keras), Brain Connectivity estimation,

Academic and Research Positions

Research Fellow (Postdoctoral Researcher), University of Southampton, United Kingdom (Sep 2024 – Present)

• Key contributor to the European Horizon Project ETHEREAL, focusing on brain connectivity estimation using multi-modal data (EEG, fNIRS, ECG), directly supporting Bio/biomedical engineering applications.

• Developing AI and ML frameworks relevant to intelligent autonomous systems.

• Fostered Interdisciplinary Collaboration across engineering, neuroscience, and computational modelling groups, aligning with the School of Engineering's interdisciplinary themes.

Senior Research Fellow, Council of Scientific and Industrial Research (CSIR), India (Jun 2021 – Sep 2023)

- Successfully applied for and led projects funded by prestigious governmental research funding body (CSIR), demonstrating a strong track record in identifying and attracting external grants for planned research activity.
- Produced peer reviewed outputs in high impact IEEE journals.
- Supervised junior researchers and contributed to proposal writing.
- Delivered technical lectures for research groups.

Senior and Junior Research Fellow, Department of Science and Technology, (DST-WB),India (Aug 2018 – May 2021)

• Initiated and led foundational research into the theoretical development and application of Kalman filter and its variants driven estimation methodologies.

• Successfully generated multiple peer-reviewed publications from core research on nonlinear system modeling and control theory.

• Mentored and guided early career researchers on methodologies for intelligent system data analysis and control architecture design.

Teaching Assistant, Department of Applied Physics, University of Calcutta, India (Aug 2018 – Dec 2023)

• Delivered lectures on Sensors, Transducers, and Control Systems and marked assignments providing structured academic feedback.

• Contributed actively to examination assessments.

• Assisted supervision of M.Tech. theses in system engineering and control.

• Managed laboratory courses and guided undergraduate research activities.

Assistant Professor, Institute of Engineering & Management, Kolkata, India (Jan 2024 – Jul 2024)

• Taught modules on Embedded Systems, Electrical Machine, and Intelligent Control.

• Supervised undergraduate research and contributed to course planning.

• Developed laboratory material and supported curriculum updates.

Assistant Professor, Swami Vivekananda Institute of Science and Technology, Kolkata, India (Aug 2015 – Jul 2018)

• Delivered lectures for modules on Control system, Sensors and Intelligent Control.

• Prepared assessments and supported student mentoring.

• Supervised undergraduate research projects and contributed to curriculum development.

Education

PhD (Tech.) in Electrical Engineering, University of Calcutta, India (Oct 2020 – Jul 2024) Thesis: *Application of Kalman filter variants for indoor thermal environment modelling and estimation with unknown inputs.* (Awarded: Apr, 2025)

M.Tech. in Instrumentation and Control Engineering, University of Calcutta, India (Aug 2013 – Jun 2016)
Graduated with Distinction (CGPA 7.9). Thesis: *Development of ECG Compression Algorithm using Huffman Coding and its hardware realization.*

B.Tech. in Instrumentation and Control Engineering, West Bengal University of Technology, India (Jul 2007 – Jun 2011)
Graduated with Distinction (DGPA 8.15). Project: *Comparative study of PID and Fuzzy Logic Controllers.*

Selected Publications

• Das, B. P. et al., *Time-varying Unknown Input Constrained UKF with Unbiased Minimum Variance Estimator*, IEEE Transactions on Instrumentation & Measurement, 2025.
DOI: https://doi.org/10.1109/TIM.2025.3606059

• Das, B. P. et al., *Dynamic Nonlinear Indoor Environment Thermal State Estimation Using PSO Guided Adaptive EKF*, IEEE Transactions on Automation Science and Engineering, 2024. **DOI:** https://doi.org/10.1109/TASE.2024.3354930

• Das, B. P. et al., *PSO-guided optimal estimator enabled regularized adaptive EKF for nonlinear indoor thermal estimation*, Journal of Building Performance Simulation, 2024. **DOI:** https://doi.org/10.1080/19401493.2024.2324814

• Das, B. P. et al., *Joint state estimation of indoor thermal dynamics with unknown inputs*, Journal of Building Performance Simulation, 2022. **DOI:** https://doi.org/10.1080/19401493.2022.2111604

• Conference Papers: TENSYMP 2019, IBSSC 2022, ICCCNT 2024, CIEC 2024.

Tools and Technical Skills

- **Programming Languages**: MATLAB, Python (NumPy, Pandas, Scikit-learn, Keras), C/C++
- **Hardware/Embedded:** Raspberry Pi, Arduino, Conceptual knowledge of Integrated Circuit Design (ASIC/FPGA) logic for embedded realization.
- **Signal Processing & Biomedical data:** EEG/fNIRS preprocessing, Feature Extraction, Brain Connectivity Analysis, Data Analytics, EEG Lab, Homer, Hermes, BCT Toolbox.
- **AI/ML/Control:** Deep Learning, Optimization, Regression/Classification Models, Kalman Filter Variants (EKF, UKF), Control System Theory.
- **Professional skills:** Academic writing, Supervision, Teamwork, Presentations

Achievements and Fellowships

- Best Research Paper Award, IEEE Bombay Section Signature Conference (IBSSC 2022)
- CSIR-DIRECT Fellowship, Council of Scientific and Industrial Research, Govt. of India (2021–2023)
- Junior and Senior Research Fellowships, Department of Science and Technology, Govt. of West Bengal (2018–2021)
- Member, IEEE

Language Proficiency

English (Fluent) || German (A1) || Hindi (Near Native) || Bengali (Native)

References

Prof. (Dr.) Kaushik Das Sharma
Department of Applied Physics, University of Calcutta, Kolkata, India kdsaphy@caluniv.ac.in

Prof. (Dr.) Amitava Chatterjee
Department of Electrical Engineering, Jadavpur University, Kolkata, India
amitava.chatterjee@jadavpuruniversity.in

Prof. (Dr.) Koushik Maharatna
School of Electronics and Computer Science, University of Southampton km3@ecs.soton.ac.uk