NEELAKSHI GANGULY

PhD Scholar | Healthcare Innovation · Medical Device R&D · Clinical Translation

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PROFESSIONAL SUMMARY

Biomedical engineering researcher in the IIT Madras – CMC Vellore – SCTIMST joint PhD programme, experienced in turning a clinical need into a working, patented technology. Took ATOBOT, a post-stroke ankle–toe rehabilitation robot, from concept and early prototyping through sensor-based characterisation to a clinician-centred evaluation with 40 rehabilitation professionals; the invention is now a granted Indian patent (2026). Works across engineering and clinical teams, communicates research to technical and clinical audiences (four poster and presentation awards, 2025–26), and brings two years of client facing industry delivery at Cognizant. Keen to apply this concept to proof of concept experience to new diagnostic technologies.

CORE COMPETENCIES

Innovation & Translation	Research & Analysis	Engineering & Data	Communication & IP
Clinical need driven concept development, proof-of-concept prototyping, clinician-centred evaluation	Study protocol and IRB preparation, mixed-methods analysis (Mann–Whitney U, thematic), systematic review	Python (SciPy), MATLAB, C/C++, sensor integration (load cell, ADC, encoder), PID control	Granted patent, journal and conference writing, award-winning presentations; English, Bengali, Hindi (IELTS 7)

RESEARCH & INNOVATION EXPERIENCE

PhD Research
(IIT Madras / CMC Vellore / SCTIMST)

ATOBOT — Post Stroke Ankle–Toe Rehabilitation Robot **2022 – Present**

- Translated a clinical need in post-stroke foot rehabilitation into ATOBOT, a portable 2-DOF underactuated ankle–toe robot, taking it from concept and an early prototype to a working system
- Conducted a clinician-centred evaluation with 40 rehabilitation professionals (in-person and online): designed the protocol, ran statistical (Mann–Whitney U, Bonferroni-corrected) and thematic analysis, and identified five clinician-defined priority domains for future development
- Built the sensing and control platform (Teensy firmware, load-cell force sensing, optical encoder feedback, PID with minimum-jerk trajectories) and modelled gravity compensation from sweep experiments in Python (SciPy curve fitting, residual analysis)
- Protected the invention through a granted Indian patent and am preparing an IRB submission for the next-stage usability study
- Prepared a PROSPERO systematic review registration on robot-assisted ankle neurorehabilitation in stroke, within a project funded by Portescap CSR India

Postgraduate Thesis
(Jadavpur University)

ERP N400-Based Motor Learning Assessment **2020 – 2022**

- Proposed a novel method to assess motor-learning ability using N400 event-related potentials (ERP) as a neurophysiological marker
- Developed a TSK Type-2 Fuzzy Classifier to categorise subjects into High / Medium / Low learning adaptability groups

PATENT & PUBLICATIONS

- **Patent Granted**: Indian Patent No. 605702, granted 12 October 2026
- **PCT Application Filed**: PCT/IN2026/052158, filed 16 October 2026
- **Presented** Poster in ICNR2026 (International Conference on Neurorehabilitation), Seoul, South Korea, Sep 29 – Oct 2, 2026 — Poster title: “An Underactuated 2-DOF Ankle–Toe Rehabilitation Robot for Post-Stroke Foot Function Training”

- **N. Ganguly et al.**, "Design and Clinician-Centered Evaluation of ATOBOT: An Underactuated 2-DOF Ankle-Toe Rehabilitation Robot for Post-Stroke Foot Function Training", Frontiers in Medical Technology — submitted, under review (Manuscript ID 1964680)
- **N. Ganguly (Co-author)**, "A Computational Approach to Broad Cardiac Disorders in the Light of Ayurveda", 10th Inter University Engineering, Science & Technology Academic Meet (FOSET), NSHM Knowledge Campus, Kolkata, 31 March 2019
- **N. Ganguly (Co-author)**, "Unidentified Input Observer: Comparative Study through Block Pulse Function and Hybrid Function", CIPR 2019 (1st Int. Conf. on Computational Intelligence in Pattern Recognition), IIEST Shibpur, 19–20 January 2019 — Springer Singapore, 2020
- **N. Ganguly (Co-author)**, "Solving Stochastic Differential Equations Using Hybrid Functions", 12th International Conference MSAST, 2018

AWARDS & SCIENTIFIC COMMUNICATION

- **First Prize**, E-Poster Presentation (PhD Students category), 16th Annual Research Day, CMC Vellore, 5–6 October 2026
- **Best 3MT Presentation Award**, BioMET '26 (International Conference on BioMaterials, BioEngineering, and BioTheranostics), VIT Vellore, 5–6 August 2026
- **First Prize**, E-Poster Presentation (Overall), ITNRCON & IFNRCON 2026 (2nd International Tele Neuro Rehabilitation Conference & 14th Annual Conference of IFNR), Mumbai, 9–12 April 2026
- **2nd Prize**, E-Poster Presentation (PhD Students category), 15th Annual Research Day, CMC Vellore, 30–31 October 2025
- **Cognizant Recognition** — CognizantCheers Award ("Doing the right thing, the right way"), October and November 2021; Certificate of Appreciation as GenC campus-hiring jury, December 2021

EDUCATION

Degree / Examination	Institute / Board	Specialisation	Score	Year
PhD (Ongoing)	IIT Madras – CMC Vellore – SCTIMST (Three-Institute Programme)	Rehabilitation Robotics / Neurorehabilitation	-	2022 – Present
M.E. Biomedical Engineering	Jadavpur University	Biomedical Engineering	9.05 CGPA	2022
B.Tech Electrical Engineering	St. Thomas' College of Engineering (MAKAUT)	Electrical Engineering	8.71 CGPA	2020

PROFESSIONAL EXPERIENCE

Senior SAP Consultant
(Cognizant Technology Solutions)

Centrica SAP AR AMS Project **Aug 2020 – Jul 2022**

- Worked on the Centrica SAP AR AMS project (SAP-ABAP, CRM, IS-U) in a client-facing delivery role
- Responsible for client interaction, end-to-end testing and production deployment

CLINICAL RESEARCH INTERNSHIP

- **Institute of Neurosciences Kolkata**, Movement Disorder Laboratory, RGCM Research Centre — Research Internship, 20 June – 20 July 2022

TEACHING EXPERIENCE

- **Graduate Teaching Assistant**, Dept. of Bioengineering, CMC Vellore, January 2024 – present — six semesters across Transducers and Instrumentation, Advanced Linear Algebra and Data Analysis, and Bioelectricity

Abbreviations: ALADA-Advanced Linear Algebra and Data Analysis; PWM – Pulse Width Modulation; ADC – Analog-to-Digital Converter; PID – Proportional–Integral–Derivative; ERP – Event-Related Potential; TSK – Takagi–Sugeno–Kang; SPI/I2C – Serial Peripheral Interface / Inter-Integrated Circuit; CGPA – Cumulative Grade Point Average; IELTS – International English Language Testing System