# Dr. Dipankar Bhattacharya, Ph.D.

**Marie Skłodowska-Curie Postdoctoral Fellow (2025–2027)**
**Dyson School, Imperial College London, United Kingdom**

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## Summary Statement

Knowledge as such does not have much power unless it is transformed into technology, which is capable of accelerating the progress of mankind. The long cherished dream of becoming the orchestrate of transforma- tion leads my eyes and heart towards the academics and research.

## Education

2016 – 2021 **Ph.D., Mechatronics Enginnering** in Department of Mechanical and Mechatronics Engineering, The University of Auckland (UoA), 01/08/2016 – 14/04/2021.
Thesis title: *Robotic Soft Esophagus Design, Modelling, and Control for Endoprosthetic Stent Testing and Food Swallow Investigation*

2011 – 2013 **M.Tech , Systems and Control** in Department of Electrical Engineering, Indian Institute of Technology (IIT), 22/07/2011 – 04/07/2013.
Dissertation title: *Non-Linear Predictive Control Model using Relevance Vector Machine*. GPA: **8.4** / **10.0**

2004 – 2010 **B.Tech , Electronics and Communication Engineering**, North Eastern Regional Institute of Science and Technology (NERIST), 21/07/2004 – 23/06/2010.
Project title: *Design and Synthesis of a Sixth Order Tow Thomas Bi-quad filter*. GPA: **9.1** / **10.0**

## Employment History

2025 – Current **Marie Skłodowska-Curie Postdoctoral Fellow** in the Dyson School of Engg, Imperial College London, Supervisor: Prof. Thrishantha Nanayakkara, 01/11/2025 – Current.
*CASREx: Cable-driven Arm Soft Re-configurable Exoskeleton for Muscle Impairment Rehabilitation*

## Employment History (continued)

2025 — **Senior Research Engineer–Control Systems** in the Center for Transformative Garment Production (TransGP), Supervisor: Prof. Kazuhiro Kosuge, 01/05/2025 – 31/10/2025.
*Physics-based Cloth Manipulation with policy generated from imitation learning.*
***Research Responsibilities:***

- Led a multidisciplinary team to develop high-performance models for fabric pre-sewing handling and folding.
- Investigated feasibility and oversaw development and validation of robotic systems for fabric manipulation.
- Translated industrial requirements into research deliverables through close collaboration and experimental analysis.
- Contributed to scientific papers, technical reports, and grant proposals for dissemination and funding.

  ***Other Responsibilities:***

  - Mentoring and supervising PhD students, 3 at the moment.
  - Reviewing, writing, and proofreading manuscripts.

2024 – 2025 — **Postdoctoral Fellow** in the Center for Transformative Garment Production (TransGP), Supervisor: Prof. Kazuhiro Kosuge, 02/07/2024 – 30/04/2025.

**Visiting Research Associate** in the Department of Electrical and Electronic Engineering, Hong Kong University (HKU), 02/07/2024 – 31/10/2025.

2021 – 2024 — **Postdoctoral Fellow** in the Department of Mechanical and Automation, The Chinese University of Hong Kong. Supervisor: Prof. Darwin Lau, 01/03/2021 – 30/06/2024
*Project title 1: Modeling and control of cable-driven robots with cable wrapping around obstacles and links.*
*Project title 2: Design of a cable-driven growing vine robot for safer false ceiling inspections.*
Primary responsibilities:

- Conduct independent and collaborative research, contributing to larger projects under PI supervision.
- Write research articles, proposals, and technical reports.
- Mentor undergraduate and postgraduate students; delivered lectures for ***MAEG5090 Topics in Robotics***.

2021 – 2022 — **Visiting Postdoctoral Fellow** in Laboratoire des Sciences du Numérique de Nantes (LS2N), École Centrale de Nantes (ECN). Supervisors: Prof. Stephane Caro and Prof. Darwin Lau, 26/10/2021 – 05/01/2022.
*Project title: Iterative-learning control of cable-driven parallel robot.*

## Employment History (continued)

2017 – 2020 **Graduate Teaching Assistant** at The University of Auckland. *Courses taken: MECHENG 706: Mechatronics Design Projects, MECHENG 306: Design of Sensing and Actuating Systems, ENGGEN 115: Principles of Engineering Design, ENGGEN 131: Introduction to Engineering Computation and Software Development.*

- Supervised undergraduate students on design projects, guiding problem-solving and ensuring practical solutions.
- Delivered tutorials, workshops, and drop-in clinics; provided support via online forums (Piazza, CANVAS).
- Managed laboratory sessions and coordinated TA activities, including safety briefings and student progress monitoring.

2018 – 2019 **Research Assistant** at The University of Auckland, under the direction of Prof Peter Xu, 09/01/2018 – 08/01/2019.

2013–2016 **Lecturer (Assistant Professor Grade-1)** in School of Electrical, Electronics and Communication Engineering (SEECE) at Galgotia's University (GU), 19/07/2013–18/06/2016.

- Delivering lectures for undergraduate and postgraduate courses.
- Developing and constructing teaching materials for lectures.
- Supporting students in a pastoral/advisory role.
- Delivering laboratory sessions, and managing and supervising staffs and lab technicians.
- Supervision of final year undergraduate projects.

## Research Publications

### Journal (Published/Accepted)

1. Jin*, B., Kobayashi*, A., Bhattacharya, D., Seino, A., Tokuda, F., Tien, N., & Kosuge, K. (2025). Automated Straight-line Sewing of Stretchable Fabrics with Different Lengths [*Equal contribution.]. *IEEE Robotics and Automation Letters*, 1–8. https://doi.org/10.1109/LRA.2025.3619791
2. Bhattacharya, D., Cheung, T. K., Wang, Y., & Lau, D. (2025). Kinematic and Dynamic Modeling of Cable-Object Interference and Wrapping in Complex Geometrical-Shaped Cable-Driven Parallel Robots. *Mechanism and Machine Theory*, *214*, 106092. https://doi.org/10.1016/j.mechmachtheory.2025.106092
3. Bhattacharya, D., Chan, Y. P., Shang, S., Chan, Y. S., Tan, Y., & Lau, D. (2023). Tri-Space Operational Control of Redundant Multilink and Hybrid Cable-Driven Parallel Robots Using an Iterative-Learning based Reactive Approach. *IEEE Transactions on Control Systems and Technology*. https://doi.org/10.1109/TCST.2023.3263689
4. Bhattacharya, D., Cheng, L. K., & Xu, W. (2021). Nonlinear Model Predictive Control of a Robotic Soft Esophagus for Endoprosthetic Stent Testing. *IEEE Transactions on Industrial Electronics*. https://doi.org/doi:10.1109/TIE.2021.3121755
5. Bhattacharya, D., Jesna, S., Cheng, L. K., & Xu, W. (2021). RoSE: A Robotic Soft Esophagus for Endoprosthetic Stent Testing. *Soft Robotics*. https://doi.org/10.1089/soro.2019.0205
6. Dang, Y., Liu, Y., Hashem, R., Bhattacharya, D., Allen, J., Stommel, M., Cheng, L. K., & Xu, W. (2021). SoGut: A Soft Robotic Gastric Simulator. *Soft Robotics*. https://doi.org/10.1089/soro.2019.0136

7. Bhattacharya, D., Cheng, L. K., & Xu, W. (2020). Sparse Machine Learning Discovery of Dynamic Differential Equation of an Esophageal Swallowing Robot. *IEEE Transactions on Industrial Electronics*, *67*(6), 4711–4720. https://doi.org/10.1109/TIE.2019.2928239

8. Bhattacharya, D., Nisha, M. G., & Pillai, G. (2015). Relevance vector-machine-based solar cell model. *International Journal of Sustainable Energy*, *34*(10), 685–692. https://doi.org/10.1080/14786451.2014.885030

9. Dong, W., Bhattacharya, D., Kobayashi, A., Seino, A., Tokuda, F., Huang, X., Tang, K., Tien, N. C., & Kosuge, K. (2025). Precise Top-layer Fabric Segmentation for Fabric Destacking with Edge- and Shape-Aware Deep Networks. *2025 IEEE International Conference on Mechatronics and Automation (ICMA)*, 1343–1348.

10. Bhattacharya, D., Cheng, L. K., & Xu, W. (2018). Testing and Analysis of Migration Displacement of a Flared Stent Deployed in an Esophageal Swallowing Robot. *25th International Conference on Mechatronics and Machine Vision in Practice (M2VIP)*, 1–6. https://doi.org/10.1109/M2VIP.2018.8600911

11. Bhattacharya, D., Cheng, L. K., Dirven, S., & Xu, W. (2017). Actuation planning and modeling of a soft swallowing robot. *24th International Conference on Mechatronics and Machine Vision in Practice (M2VIP)*, 1–6. https://doi.org/10.1109/M2VIP.2017.8211476

### Books and Chapters

1. Bhattacharya, D., Cheng, L. K., Dirven, S., & Xu, W. (2019). *Artificial intelligence approach to the trajectory generation and dynamics of a soft robotic swallowing simulator*. Springer International Publishing. https://doi.org/10.1007/978-3-319-78452-6_1

### In Review/Preparation

1. Bhattacharya*, D., Tang*, K., Hang, X., Tokuda, F., Tien, N., & Kosuge, K. (2026). RTFF: Random-to-Target Fabric Flattening Policy Using Dual-Arm Manipulator, IEEE International Conference on Robotics and Automation (ICRA) [in review. *Equal contribution].

2. Wang, W., Bhattacharya, D., Kobayashi, A., Seino, A., Tokuda, F., Tien, N., & Kosuge, K. (n.d.). Automated Fabric Alignment Using Global-Local Optimization and Point Cloud Registration, IEEE Transactions on Automation Science and Engineering (T-ASE) [in review].

3. Cheung, T., Bhattacharya, D., & Lau, D. (n.d.). Rapidly Deployable Deformable Frame Cable-Driven Parallel Robots with Small Footprint [in preparation].

4. Wang, Y., Bhattacharya, D., & Lau, D. (n.d.). Static modelling and workspace analysis with arbitrary cable attachment design in a cable-driven parallel robot with passive backbone, IEEE Transactions on Automation Science and Engineering [in preparation].

## Grants and Scholarships

### Grants/Fellowships

2025 — Recipient, ***Horizon Europe Marie Skłodowska-Curie Postdoctoral Fellowship*** for the project "CAS-REx" (Grant No. 101205678), hosted at ***Imperial College London.*** Funded under HORIZON-MSCA-2024-PF-01-01. Duration: 24 months, ***EUR 276,187.92.***

2023 — Co-authored Innovation and Technology Fund (ITF), Partenership Research Program (PRP) grant.

2022 — Co-authored Research Talent Hub for ITF project (RTH-ITF) grant.

2018 — Recipient, Dynamic testing of implant stents using Robotic Soft Esophagus (RoSE), BvW Holding, Cham, Switzerland (39,000 NZD, 1 year) .

2018, 2019 — Recipient, Riddet Travel grant, Riddet Institute Centre of Research Excellence (3,000 NZD).

## Grants and Scholarships (continued)

### Scholarships

2019–2020 Recipient, Doctor of Philosophy Scholarship, University of Auckland.

2016–2019 Recipient, Doctor of Philosophy Scholarship, Riddet Institute Centre of Research Excellence.

2011–2013 Recipient, Masters of technology Scholarship, Ministry of Human Resource (MHRD) GATE scholarship.

## Academic Awards, and Miscellaneous Achievements

### Academic Awards

2017 Recipient, **Best Conference paper award**, 5th International Conference on Robotic Intelligence Technology and Applications (RiTA), Daejeon, Korea.

**Ranked 2nd** in poster presentation in Delivery of Functionality in Complex Food Systems (DoF 2017) Conference.

### Competitive Examinations

2011 **Percentile: 99.12% (Rank 1,211/1,37,853)** in Graduate Aptitude Test of Engineering (GATE).

2010 **Percentile: 96.00%** in Graduate Aptitude Test of Engineering (GATE).

2004 **Ranked 31st** in All India Junior mathematics Olympiad.

### Professional Activities

09/08/2025 Invited Speaker, **World Robotics Conference (WRC 2025)**, Beijing, China. Presented research on *Fabric modeling and perception for garment manufacturing*, exploring robotics and AI solutions for fabric representation, simulation, and real-world applications.

03/08/2025 Workshop Organizing and Presentation "Mesh-based Fabric State Estimation and Manipulation." IEEE International Conference on Mechatronics and Automation (ICMA 2025) – Workshop on Robotics for Automated Garment Production, Beijing Empark Grand Hotel, Beijing, China.

2021 - Current Reviewer of IEEE Robotics and Automation Letters (RAL), IEEE International Conference on Robotics and Automation (ICRA), ASME Journal of Mechanisms and Robotics (JMR).

2017 - Current Member of the Institute of Electrical and Electronics Engineers (IEEE).

2014 Former member of the Electrical Engineering Society (EES), IIT Roorkee, and NERIST Electronics Society (NES), NERIST.

2006 Have an 'Outstanding Certificate' in National Service Scheme (NSS) for contributing in activities like blood donation camps, village cleanliness programmes and children education.

## Skills

Languages Strong reading, writing and speaking competencies for English, and Hindi.

Coding PyTorch, Gym framework, Blender, MATLAB, Python, ROS, LabVIEW, Assembly level languages (Microprocessor: 8085, 8086 and MASM 32 and Microcontroller: 8051), and LaTeX.

Software and misc Blender, SOLIDWORKS, Inventor, Inkscape, Git, and Lightroom.

Microprocessors Raspberry Pi, myRIO, and Arduino.

## References

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