Curriculum Vitae

PERSONAL INFORMATION

SHOUVIK CHAUDHURI (PhD)

Denmark – Voldgade 4, 1.tv, 6400, Sønderborg.
India - 87/12/471 E, Usha Manjaree, Flat – B1, Raja S. C. Mallick Rd.,
P.O. – Naktala, Ramgarh, Kolkata-700 047, West Bengal, India.

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https://scholar.google.co.in/citations?user=sXYaj-AAAAAJ&hl=en

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drshouvikchaudhuri

Sex	Male
Date of birth	16 December 1988
Nationality	Indian
Marital Status	Single
Current Status	Postdoctoral Researcher
Membership	IEEE (Member – Kolkata Section)
Reviewer	IEEE (TMech, Sensors, TVT, TIM, I2MTC) Elsevier (CEP, Mechatronics, CEA) Springer (JBSMSE, Sadhana)

WORK EXPERIENCE

01 Mar'24 – Present

Postdoctoral Researcher (SAFEMARVEL Project)

Centre for Industrial Mechanics, South Denmark University (SDU), Sønderborg, Denmark

Funding Agency: *Den Danske Maritime Fond (DDMF)*

Project Title: *A Safety-critical control Framework for roll stabilization of Marine Vessels.*

Principal Investigator: *Prof. Jerome Jouffroy,* Professor, CIM, Department of Mechanical and Electrical Engineering (DME), Sønderborg, Denmark.

Key Responsibilities:

- Develop a safety-critical control framework for roll stabilization of marine vessels, with the aid of control barrier functions (CBF) to always guarantee vessel stability and safety. Also, designing a high-performance learning-based controller, based on this framework, with particular focus on reinforcement learning (RL) for various sea conditions, involving a collaboration between our industrial partner Dacoma ApS and academic partner SDU Physics Dept.

01 Mar'22 – 29 Feb'24

Postdoctoral Researcher (AMCOSTAR Project)

Centre for Industrial Mechanics, South Denmark University (SDU), Sønderborg, Denmark

Funding Agency: *Eurostars/Eureka Network and Innovation Fund Denmark*

Project Title: *Dynamic Airkeel Stabilizer for Increasing the Capacity of Smaller Boats Through Active Control*

Principal Investigator: *Prof. Jerome Jouffroy*, Professor, CIM, Department of Mechanical and Electrical Engineering (DME), Sønderborg, Denmark.

Key Responsibilities:

- Development of nonlinear control algorithms for the roll stabilization of marine vessels equipped with the Airkeel Technology involving a collaboration between the consortium partners (SDU, Dacoma, TUCO Marine group, Automasjon & Data). Demonstrate the stabilizing and load carrying capabilities of an integrated Airkeel and adaptive control system (ACS) on a small boat.

07 Dec'15 – 28 Feb'22

Research Fellow (CARS Project)

Hydraulics Laboratory, Jadavpur University, Kolkata, West Bengal, India

Sponsoring Agency: *Centre for Artificial Intelligence & Robotics* (**CAIR**), Bengaluru, India

Project Title: *Design and Development of a Quadruped torso with external electrohydraulic power system for realisation of an autonomous robot.*

Principal Investigator: *Prof. Saikat Mookherjee*, Professor, Department of Mechanical Engineering, Jadavpur University.

Key Responsibilities:

- Development and assembly of an electro-hydraulic quadruped robot as part of an interdisciplinary research team.
- Design and implementation of real time controllers in LabVIEW for quadruped actuation system with feedback.
- MATLAB/SIMULINK based simulation and optimization (GA based) studies.
- Maintenance and purchase of lab equipment.

02 Aug '13 – 07 Dec '15

Research Fellow (DARO Project)

Hydraulics Laboratory, Jadavpur University, Kolkata, West Bengal, India

Sponsoring Agency: *Aeronautics Research & Development Board* (**AR&DB**), India

Project Title: *High-frequency real-time tracking control for linear servo actuation system.*

Principal Investigator: *Prof. Rana Saha*, Professor, Department of Mechanical Engineering, Jadavpur University.

Key Responsibilities:

- Development of model-free and adaptive controllers for motion control of linear actuators in the high frequency regime in LabVIEW environment.
- Application of control methodologies such as Sliding mode control, Fuzzy Logic and Neural networks in synergistic combinations.
- MATLAB/SIMULINK based simulation studies.

COLLABORATIONS

RNA Biology Lab (Department of Life Sc. and Biotechnology, Jadavpur University)

Collaborators: Prof. Biswadip Das and Dr. Subhadeep Das

Contribution: Development of image processing algorithms in MATLAB for analysing co-localization of yeast cells (*S. cerevisiae*) from confocal microscopy images.

Gachhui Lab (Department of Life Sc. and Biotechnology, Jadavpur University)	**Collaborators:** Prof. Ratan Gachhui and Dr. Soumyadev Sarkar
	Contribution: Development of image processing algorithms in MATLAB for determining the area covered by the cells and the hyphal structures of *P. laurentii* from their SEM images.

GRANTS AND FUNDING

Fabricant Mads Clausen Fond (FMC), 2023	**Investigators: Shouvik Chaudhuri,** Hossein Ramezani and Paride Gullo
	Project: Refrigeration, Air Conditioner and Heat Pump system for training next generation Danfoss engineers at SDU Sønderborg.
	Amount Granted: 100,000 DKK (12,13,520.00 INR)
Den Danske Maritime Fond (DDMF), 2023	**Investigators:** Jerome Jouffroy (PI) and Hossein Ramezani (co-PI)
	Grant Preparation: Shouvik Chaudhuri
	Project: A SAfety-critical control FramEwork for roll stabilization of MARine VEsseLs (**SAFEMARVEL**).
	Amount Granted: 1,489,000 DKK (1,80,69,312.00 INR)

TEACHING & SUPERVISION

Experimental Control Systems (XCOS)	Course designed to develop deep knowledge on practical and experimental application of control systems techniques.
	Level: Masters (2nd Sem) **ECTS:** 5.0
	Course Offered for: Spring 2023, Spring2024
	Role: Lecturer
Expert in Teams (EXT)	Course designed to enhance students' knowledge, skills, and competencies by challenging them in a real-life engineering context, fostering interdisciplinary collaboration and broadening their skill set.
	Level: Bachelors (5th Sem) **ECTS:** 10.0
	Course Offered for: Fall 2023, Fall 2024
	Role: Supervisor
Control Engineering 1 (COE1)	Introductory course in control systems involving system modelling, signal flow graphs, Routh stability criteria, root locus methodology, frequency response techniques and PID control.
	Level: Bachelors (4th Sem) **ECTS:** 5.0
	Course Offered for: Spring 2024
	Role: co-Lecturer

PUBLICATIONS

Journals (First Authorship)	1. **Shouvik Chaudhuri**, Rana Saha, Amitava Chatterjee, Saikat Mookherjee and Dipankar Sanyal. *Adaptive Neural-Bias-Sliding Mode Control of Rugged Electrohydraulic System Motion by Recurrent Hermite Neural Network.*
	Journal: **Control Engineering Practice (Elsevier), 103, pp. 104588**
	Published on: **October 2020**
	ISSN: **0967-0661**
	DOI: 10.1016/j.conengprac.2020.104588.

2. **Shouvik Chaudhuri**, Rana Saha, Amitava Chatterjee, Saikat Mookherjee and Dipankar Sanyal. *Development of a Motion Sensing System based on Visual Servoing of an Eye-in-hand Electrohydraulic Parallel Manipulator*.

Journals (Co-Authorship)

3. Hossein Ramezani, **Shouvik Chaudhuri**, Jerome Jouffroy, Arnd Baurichter, and Steen Mattrup Hansen. *On Roll Stabilisation Using a Canting Keel*.

4. Aniruddha Sarkar, Sibsankar Dasmahapatra, Shouvik Chaudhuri, Rana Saha, Saikat Mookherjee and Dipankar Sanyal. *A Novel Order-Separated Generalized Feedforward Design for Motion Control in Energy-efficient Electrohydraulic System with Proportional and Integral Feedback*.

5. Ishita De, Subhasish Sarkar, **Shouvik Chaudhuri**, Nitesh Mondal and Niraj Kumar. *Effect of Dynamic Swivelling Torque and Eccentricity on the Design of Compensator Cylinders for a Variable Displacement Axial Piston Pump-Modelling & Simulation*.

6. Aniruddha Sarkar, Krishnendu Maji, Shouvik Chaudhuri, Rana Saha, Saikat Mookherjee and Dipankar Sanyal. *Actuation of an electrohydraulic manipulator with a novel feedforward compensation scheme and PID feedback in servo-proportional valves*.

7. Subhasish Sarkar, Rupam Mandal, Nitesh Mondal, **Shouvik Chaudhuri**, Tapendu Mandal, Gautam Majumdar. *Modelling and Prediction of Micro-hardness of Electroless Ni-P coatings Using Response Surface Methodology and Fuzzy Logic*.

Published on: **December 2022**
ISSN: **1995-6665**

8. Priyankan Datta, Aranyak Chakravarty, Ritabrata Saha, **Shouvik Chaudhuri**, Koushik Ghosh, Achintya Mukhopadhyay, Swarnendu Sen, Anu Dutta, Priyanshu Goyal. *Experimental investigation on the effect of initial pressure conditions during steam-water direct contact condensation in a horizontal pipe geometry.*

Journal: **International Communications in Heat and Mass Transfer (Elsevier), Vol. 121, pp. 105082**
Published on: **February 2021**
ISSN: **0735-1933**
DOI: 10.1016/ j.icheatmasstransfer.2020.105082

9. Soumyadev Sarkar, Avishek Mukherjee, Subhadeep Das, Bidisha Ghosh, **Shouvik Chaudhuri**, Debanjana Bhattacharya, Arpita Sarbajna, Ratan Gachhui. *Nitrogen deprivation elicits dimorphism, capsule biosynthesis and autophagy in Papiliotrema laurentii strain RY1.*

Journal: **Micron (Elsevier), Vol. 124, pp. 102708**
Published on: **September 2019**
ISSN: **0968-4328**
DOI: 10.1016/j. micron.2019.102708

10. Subhadeep Das, Subir Biswas, **Shouvik Chaudhuri**, Arindam Bhattacharyya, and Biswadip Das. *A nuclear zip code in SKS1 mRNA promotes its slow export, nuclear retention, and degradation by the nuclear exosome/DRN in Saccharomyces cerevisiae.*

Journal: **Journal of Molecular Biology (Elsevier), 431(19), pp. 3626-3646**
Published on: **September 2019**
ISSN: **0022-2836**
DOI: 10.1016/j.jmb.2019.07.005

Book Chapters

11. **Shouvik Chaudhuri**, Sibshankar Dasmahapatra, Amitava Chatterjee, Rana Saha, Saikat Mookherjee and Dipankar Sanyal. *Adaptive Fuzzy - Sliding Mode Control with Fixed Bias Compensator for an Electrohydraulic Actuation System with Hard Nonlinearities.*

Book Series: **Lecture Notes in Mechanical Engineering (LNME)**
Book Title: **Fluid Mechanics and Fluid Power – Contemporary Research**
Publisher: **Springer, New Delhi**
ISBN: **978-81-322-2743-4**
DOI: 10.1007/978-81-322-2743-4_116

Conference Proceedings

12. Hossein Ramezani, **Shouvik Chaudhuri**, Jerome Jouffroy, Arnd Baurichter, and Steen Mattrup Hansen. *On Roll Stabilisation Using a Canting Keel.*

Conference: **62nd IEEE Conference on Decision and Control (CDC), 2023**
Date and Place: **Dec. 13-15, 2023, Singapore**
Status: **Available on IEEE Explore**
DOI: 10.1109/CDC49753.2023.10384049

13. **Shouvik Chaudhuri**, Hossein Ramezani and Jerome Jouffroy. *Investigation of*

marine vessels equipped with an airkeel subject to wave-induced disturbances.

Conference: **IEEE Conference on Control Technology and Applications (CCTA), 2023**
Date and Place: **Aug. 16-18, 2023, Bridgetown, Barbados**
Status: **Available on IEEE Explore**
DOI: 10.1109/CCTA54093.2023.10252537

14. **Shouvik Chaudhuri**, Hossein Ramezani and Jerome Jouffroy. *Modelling and control of a canting-keel based ship roll stabilization system for crane operations.*

Conference: **IEEE International Conf. on Systems, Man and Cybernetics (SMC) 2022**
Date and Place: **Oct. 9-12, 2022, Prague, Czech Republic**
Status: **Available on IEEE Explore**
DOI: [10.1109/SMC53654.2022.9945570](10.1109/SMC53654.2022.9945570)

15. Rajarshi Bhattacharjee, **Shouvik Chaudhuri** and Anindita Ganguly. *Robust control of pulsatile ventricular assist devices for patients with advanced heart failure.*

Conference: **Third International Conf. on Frontiers in Computing and systems (COMSYS) 2022**
Date and Place: **Dec. 19-21, 2022, IIT Ropar, India**
Status: **Available on Springer**
DOI: [10.1007/978-981-99-2680-0_29](10.1007/978-981-99-2680-0_29)

16. Rajarshi Bhattacharjee, Soumalya Kundu and **Shouvik Chaudhuri**. *Evaluation of Workspace and Coupled Motions of an Electrohydraulic Parallel Manipulator.*

Conference: **Fourth International Conf. on Electrical, Computer and Communication Technologies (ICECCT) 2021**
Date and Place: **Sept. 15-17, 2021, Erode, Tamil Nadu, India**
Status: **Available on IEEE Explore**
DOI: 10.1109/ICECCT52121.2021.9616672

17. Soumalya Kundu, Rajarshi Bhattacharjee and **Shouvik Chaudhuri**. *Evaluation of fuzzy-logic based position control strategies for an electrohydraulic actuation system.*

Conference: **International Conf. on Advances in Electrical, Computing, Communication and Sustainable Technologies (ICAECT) 2021**
Date and Place: **Feb. 19-20, 2021, Bhilai, India**
Status: **Available on IEEE Explore**
DOI: 10.1109/ICAECT49130.2021.9392479

18. **Shouvik Chaudhuri**, Rana Saha, Saikat Mookherjee, Dipankar Sanyal and Amitava Chatterjee. *Visual sensing based adaptive sliding mode control of position tracking in electrohydraulic systems.*

Conference: **Second International Conf. on Control, Instrumentation, Energy & Communication (CIEC) 2016**
Date and Place: **Jan. 28-30, 2016, Kolkata, India**
Status: **Available on IEEE Explore**
DOI: 10.1109/CIEC.2016.7513762

19. **Shouvik Chaudhuri**, Saikat Mookherjee and Dipankar Sanyal. *Adaptive force tracking in electrohydraulic system with first-order sliding mode control.*

   Conference: **IEEE First International Conf. on Control, Measurement, and Instrumentation (CMI) 2016**
   Date and Place: **Jan. 8-10, 2016, Kolkata, India**
   Status: **Available on IEEE Explore**
   DOI: 10.1109/CMI.2016.7413759

20. Sibshankar Dasmahapatra, **Shouvik Chaudhuri**, Pranibesh Mandal, Saikat Mookherjee and Rana Saha. *Fuzzy-PI control of motion tracking by an electrohydraulic system with multiple nonlinearities.*

   Conference: **Michael Faraday IET International Summit 2015**
   Date and Place: **Sept. 12-13, 2015, Kolkata, India**
   Status: **Available on IEEE Explore**
   DOI: 10.1049/cp.2015. 1612

Books   21. **Shouvik Chaudhuri**. *Pressurised Water Nuclear Reactor – Dynamics, Modelling and Simulation.*

   Publishing House: **Lap-Lambert Academic Publishing**
   ISBN: **978-620-0-09362-2**
   URL: pressurised-water-nulear-reactors

ACADEMIC CREDENTIALS   ▪

14 July'15 – 01 Nov'21   **PhD (Engineering)**
Electrical Engineering Department, Jadavpur University, Kolkata, W.B., India

Thesis Supervisors: Prof. Amitava Chatterjee (Professor, Electrical Engg. Dept.)
                         Prof. Saikat Mookherjee (Professor, Mechanical Engg. Dept.)

Thesis Title: *Developing Electrohydraulic System Solutions using Adaptive-Neuro-Sliding Mode Control and Vision Sensing*

Major Fields of Work: Adaptive Control, Sliding Mode Control, Neural Networks, Image-based Visual Servoing, Electrohydraulic Actuation Systems, Parallel Manipulators.

Summary of the Work: Developing real-time control solutions for industry-grade Electrohydraulic actuation systems (EHAS) by utilizing hybrid adaptive control strategies constructed around the sliding mode control approach and the recurrent neural networks. In addition, vision based feedback control or visual servoing principles (image-based) are utilized to develop a motion sensing application with the aid of a multi-actuator EHAS or parallel manipulator (*Stewart Platform*) and a monocular camera mounted on the end-effector of the parallel manipulator.

Aug'11 – June'13   **Master of Nuclear Engineering [M.E.]**
Jadavpur University, Kolkata, West Bengal, India

Total Marks: 86.28%

Major Subjects: Reactor Physics & Engineering – I & II, Reactor Control Engineering, Concepts in Nuclear Science, Active Circuits & Systems, Reactor Thermal Hydraulics, Microscale Heat Transfer, Two Phase Flow.

Aug '07 – June '11   **Bachelor of Technology in Electrical Engineering [B. Tech in EE]**
Seacom Engineering College, West Bengal University of Technology, W.B., India

DGPA: 8.73

Major Subjects: Control Systems – I & II, Electrical Machines – I & II, EM Field Theory, Microprocessors and Microcontrollers, Digital Signal Processing.

April 2006   **Higher Secondary [Class XIIth]**
Kendriya Vidyalaya Ballygunge (KVB) [CBSE], Kolkata, West Bengal, India

Total Marks: 87.20%

Subjects: Physics, Chemistry, Mathematics, Biology, English.

April 2004   **Secondary [Class Xth]**
Kendriya Vidyalaya Ballygunge (KVB) [CBSE], Kolkata, West Bengal, India

Total Marks: 90.60%

Subjects: Science, Mathematics, Social Science, English, Hindi.

DISSERTATIONS

July '12– June '13   **Postgraduate Dissertation**
Bhabha Atomic Research Centre (BARC), Mumbai

Dissertation Advisor: Dr. Siddhartha Mukhopadhyay (Scientist H+, I&C Div.)

Dissertation Title: *Compact Reactor Modelling*

Major Fields of Work: Pressurised Water Nuclear Reactors, Reactor Modelling, Thermal Hydraulics, Xenon Poisoning, Reactor Regulating System, Lyapunov Stability.

Summary of the Work: Developed an analytical model of the PWR with primary and secondary loops, alongside a reactor regulating system based on first principle approach within MATLAB/Simulink environment. Stability issue of the developed models were investigated based on the Lyapunov criteria.

Dec '10– April '11   **Undergraduate Dissertation**
Seacom Engineering College, West Bengal University of Technology, W.B., India
Dissertation Advisor: Mr Sarbojit Mukherjee (Assistant Professor, Electrical Engineering Department)

Dissertation Title: *Study and fabrication of a battery – low indicator*

Major Fields of Work: Circuit Simulation & Fabrication, DC and Transient Analysis

Summary of the Work: Developing a low-power and efficient circuit for indicating low battery conditions of a rechargeable battery.

PERSONAL SKILLS

Mother tongue(s)   Bengali

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English*	C1	C1	C1	C1	C1
Hindi	C1	C1	C1	C1	C1
Danish	A1	A1	A1	A1	A1

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
*Certified by THE BRITISH COUNCIL

Proficient in	OPERATING SYSTEMS	SOFTWARES/LANGUAGES	MIC Boards
	Windows x86, x64	MATLAB / SIMULINK, LabVIEW, AutoCAD, Solidworks, Automation Studio, HTML	Arduino (Uno, Nano v3, Mega 2560), Beagle Bone (blue), STM32 (Nucleo)

DISCLAIMER

I hereby declare that all the furnished information is true to the best of my knowledge. Any suspicion of fallacy can be subjected to questioning and verification.

Date: 07.04.2024
Place: Sønderborg, Denmark

Shouvik Chaudhuri

(Signature)