National Institute of Technology, Tiruchirappalli:
Performa for CV of Faculty/ Staff Members

Curriculum Vitae

Brief Profile:

Dr. Rahul Roy is an Assistant Professor at the National Institute of Technology Tiruchirappalli, working in the areas of microfluidics, active matter, and fluid mechanics with an emphasis on integrating artificial intelligence and reinforcement learning. He obtained his Ph.D. from Indian Institute of Technology Kharagpur in electro-mechanics of complex fluids, focusing on polymeric and biological systems. He is a gold medalist in M.Tech from National Institute of Technology Durgapur and has a strong background in computational and theoretical methods.

His research interests include electrokinetics, viscoelastic fluid dynamics, and intelligent control of microswimmers. His recent work focuses on reinforcement learning-based navigation of active particles in complex flow environments, with several publications in leading journals and a granted patent.

1. Name: Dr. Rahul Roy
2. Designation: Assistant professor
3. Office Address: Department of Mechanical Engineering, NIT Trichy
4. Telephone (Direct) (Optional):

   Telephone : Extn (Optional):

   Mobile (Optional):
5. Email (Primary): rahulroy@nitt.edu Email (Secondary) : rahulr081192@gmail.com
6. Field(s) of Specialization: Microfluidics, Microswimmers, AI controlled Microswimmer navigation, Thermal Engineering

7. Employment Profile

Job Title	Employer	From	To
Assistant Professor	NIT Trichy	22-12-2025	present
Assistant Professor	GITAM Bengaluru	04-11-2025	19-12-2025
ANRF - NPDF	IISc Bengaluru	01-04-2024	03-11-2024
IoE Postdoc fellow	IISc Bengaluru	08-01-2024	31-03-2024
Project Associate	IISc Bengaluru	06-06-2023	08-01-2023

8. Academic Qualifications (From Highest Degree to High School):

Examination	Board / University	Year	Division/ Grade	Subjects
PhD	IIT Kharagpur	2017-2023	8.25	Thesis title:- Electro-mechanics of Complex Matter – from dilute polymers to human body fluids
M.Tech	NIT Durgapur	2015-2017	9.49 (Gold Medalist)	Thermal Engineering
B.E.	Pune University	2010-2014	63.4% (1st Class)	Mechanical Engineering
12th	CBSE	2009-2010	84.4 %	Science (PCM Computer science)
10th	CBSE	2007-2008	86.6%	

9. Academic/Administrative Responsibilities within the University

Position	Faculty/Department/Centre/Institution	From	To

10. Academic/Administrative Responsibilities outside the University

Position	Institution	From	To

11. Awards, Associateships etc.

Year of Award	Name of the Award	Awarding Organization
2017	Institute Gold Medal	NIT Durgapur

12. Fellowships

Year of Award	Name of the Fellowship	Awarding Organization	From (Month/Year)	To (Month/Year)
2019	QES Fellowship	University of Alberta, Canada	September 2019	Jan 2020
2024	NPDF	ANRF	01-04-2024	03-11-2025

13. Details of Academic Work

(i) Curriculum Development
(ii) Courses taught at Postgraduate and Undergraduate levels
(iii)Projects guided at Postgraduate level
(iv)Other contribution(s)

14. Details of Major R&D Projects

Title of Project	Funding Agency	Duration		Status
		From	To	Ongoing/ Completed
Collective Dynamics of Microswimmers in Nematic Liquid Crystals	ANRF	01-04-2024	03-11-2025	Completed

15. Number of PhDs guided

Name of the PhD Scholar	Title of PhD Thesis	Role(Supervisor/ Co-Supervisor)	Year of Award

16. Participation in Workshops/ Symposia/ Conferences/ Colloquia /Seminars/ Schools etc. (mentioning the role)

Date (s)	Title of Activity	Level of Event (International/ National/ Local)	Role (Participant/ Speaker/ Chairperson, Paper presenter, Any other)	Event Organized by	Venue
Dec 2022	*Proceedings of the 9th International Conference on Fluid Mechanics and Fluid Power (FMFP)*	International	Speaker	IIT Roorkee	IIT Roorkee
Dec 2024	COMPFLU 2024	International	Speaker	IIT Hyderabad	IIT Hyderabad

17. Workshops/ Symposia/ Conferences/ Colloquia/Seminars Organized (as Chairman/ Organizing Secretary/ Convenor / Co-Convenor)

Title of Activity	Level of Event (International/ National/ Local)	Date (s)	Role	Venue

18. Invited Talks delivered

Topic	Date	Inviting Organization

19. Membership of Learned Societies

Type of Membership (Ordinary Member/ Honorary Member / Life Member)	Organization	Membership No. with date

20. Academic Foreign Visits

Country	Duration of Visit	Programme
Canada	04 months	Research Intern QES Fellowship at University of Alberta

21. Publications

(A) Refereed Research Journals:

Author(s)	Title of Paper	Journal	Volume (No.)	Page numbers	Year	Impact Factor of the Journal (Optional)
Roy, R, Mukherjee, S, Lakkaraju, R, and Chakraborty, S	Streaming potential in bio-mimetic microvessels mediated by capillary glycocalyx	Microvascular Research	132	104039	2020	3.0
Roy, R, Quintero, JSM, Lakkaraju, R, Waghmare, PR, and Chakraborty,	Electro-wetting induced dynamic manipulation of symmetrically coalescing viscoelastic liquid bridges	Physics of Fluids	35		2023	4.3

S						
Roy, R, Quintero, JSM, Lakkaraju, R, Waghmare, PR, and Chakraborty, S	Droplet-On-Chip Electro-Spectroscopy Detects Ultra-Short Relaxation Time of a Dilute Polymer Solution	Soft Matter	19(28)	5345-5352	2023	3.1
Roy, R, Guha, A, Mukherjee, S, and Chakraborty, S	Elastic Contribution of Polymeric Fluids Augments Salinity-Gradient-Induced Electric Potential across a Microfluidic Channel	Journal of Colloid and Interface Science	678 (part C)	556-565	2024	9.7
Roy, R, Mandal, S.	Chemically active particles in extensional flow	Journal of Fluid Mechanics	1008	A40	2025	4.2
Roy, R, Chakraborty, P, Mandal, S.	Smart navigation of microswimmers in Poiseuille flow via reinforcement learning	Eur. Phys. J. E	48	30	2025	2.2

(B) Patent

Author(s)	Title of Patent	Patent granted by	Year of Publication	Patent Number
Roy, R, Quintero, JSM, Lakkaraju, R, Waghmare, PR, and Chakraborty, S.	*A Method For Determination of Ultra-Short Relaxation Time of a Dilute Polymer Solution*	*Intellectual Property India*	2023	551213

(C) Conferences/Workshops/Symposia Proceedings

Author(s)	Title of Abstract/ Paper	Title of the Proceedings	Page numbers	Conference Theme	Venue	Year

(D) Books & Monographs

Author(s)	Title of Book/Monograph	Name of Publishers	Year of Publication	ISSN/ISBN Number