

Isha Dhiman

Professional address:

Department of Mathematics

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Current Research:

Presently, I am working as a senior research fellow (CSIR-SRF) in the department of Mathematics at IIT Ropar. My research interests include broadly the study of non-equilibrium phenomena in driven diffusive systems using asymmetric simple exclusion process (ASEP) as a discrete modeling approach. ASEP is the simplest stochastic model, which has been used to understand the complex dynamics of many-particle systems. These models involve particle hopping in a preferred direction with some probability or rate. Such processes have applications in biological intra-cellular transport, vehicular traffic and many stochastic transport phenomena relevant to physics, chemistry and information theory etc.

Research Ambition:

I am interested in analyzing the behavior of many-particle systems with the help of multi-channel ASEP approach and study the stationary state properties of such systems.

Education:

Degree	Year	Marks/Grades	Distinction
Ph.D.	Pursuing since January 2012	A- (Course work)	
M.Sc. / M.S. (Mathematics)	2009	88.10 %	Merit position
B.Sc.	2007	79.03 %	10 th in University
12 th	2004	83.11 %	Merit position
10 th	2002	89.07%	Merit position

Publications in journals:

- 2014: Isha Dhiman and Arvind Kumar Gupta, Effect of coupling strength on a two-lane partially asymmetric coupled TASEP with Langmuir Kinetics, **Physical Review E**, 90, 012114.
- 2014: Isha Dhiman and Arvind Kumar Gupta, Two-channel totally asymmetric simple exclusion process with Langmuir kinetics: The role of coupling constant, **Euro Physics Letters**, 107, 20007.
- 2014: Arvind Kumar Gupta and Isha Dhiman, Asymmetric coupling in two-lane simple exclusion process with Langmuir Kinetics: phase diagrams and boundary layers, **Physical Review E**, 89, 022131.
- 2014: Arvind Kumar Gupta and Isha Dhiman, Analyses of continuum traffic flow model for a non-lane-based system, **International Journal of Modern Physics C**, 25 (10), 1450045.
- 2014: Arvind Kumar Gupta and Isha Dhiman, Phase diagram of a continuum traffic flow model with a static bottleneck, **Nonlinear Dynamics**, 79 (1), 663.
- 2013: Arvind Kumar Gupta and Isha Dhiman, Coupling of two asymmetric exclusion processes with open boundaries, **Physica A: Statistical Mechanics and its Applications**, 392 (24), 6314-6329.

Extended abstracts in Conferences/ Presentations:

- 2015: Isha Dhiman and Arvind Kumar Gupta, "Introduction to stochastic transport with applications in biology", Indian Women and Mathematics, Department of Mathematics, University of Delhi, New Delhi, India from 2 – 4 April, 2015.
- 2013: Isha Dhiman and Arvind Kumar Gupta, "Effects of static bottleneck in a continuum traffic flow model", The second International conference on engineering and computational mathematics, Department of Applied Mathematics, The Hong Kong Polytechnic University, Hong Kong, China from 16th December, 2013 to 18th December, 2013.
- 2013: Isha Dhiman and Arvind Kumar Gupta, "Two-channel partially asymmetric exclusion process with open boundaries" at International conference on Mathematical modeling and Numerical Simulation held at BBAU, Lucknow, U.P., India from 1st July, 2013- 3rd July, 2013.

Workshops:

- Advanced Instructional School-2012 in Numerical Analysis organized by Department of Mathematics, Panjab University, Chandigarh, India from 18th June, 2012 – 7th July, 2012.
- Workshop on Adaptive Finite Element Methods organized by Department of Mathematics, IIST, Thiruvananthapuram, India from 16th March, 2012 – 25th March, 2012.

Awards and fellowships:

- **2013:** Awarded travel grant from DST, India for participating in international conference ECM, 2013 held at The Hong Kong Polytechnic University, Hong Kong.
- **2011:** Qualified CSIR-UGC (Junior research fellowship and National eligibility test) in Mathematics and Statistics with **all India Rank-50.**
- **2010:** Qualified GATE (Graduate Aptitude Test in Engineering) in Mathematics with **all India Rank-142.**
- **2009:** Qualified CSIR-UGC (Junior research fellowship and National eligibility test) in Mathematics and Statistics with **all India Rank-21.**
- **2009:** Qualified NBHM (National Board of Higher Mathematics) fellowship for Ph.D.
- **2009:** Received award for best project presentation in Mathematics during CHANDIGARH SCIENCE CONGRESS held at department of Mathematics, P.U. Chandigarh.
- **2007:** Received V.C. Dumir scholarship in M.Sc. (HS) 1st and 2nd year from department of Mathematics, Panjab University, Chandigarh.
- **2005:** Received scholarship for securing **3rd university position** in B.Sc. from Punjabi University, Patiala.

Teaching Experience:

- **January 2012- present:** Teaching Assistant at IIT Ropar
Subjects undertaken: Operations research, Introduction to probability and stochastic processes, Fuzzy Logic and Applications
- **July 2011- December 2011:** Lecturer in Mathematics at Thapar University, Patiala.
Subjects taught: Operations research, Topology, Advanced Calculus
- **January 2010- June 2011:** Lecturer in Mathematics at SUSWEC, Mohali.
Subjects taught: Numerical Analysis, Discrete Mathematics

Additional skills:

- Proficiency in MATLAB, Mathematica, MS-Office, Latex, Linux.

Personal Details:

- Name: ISHA DHIMAN
- Sex: Female
- Nationality: Indian
- Date of birth: 5th May, 1987
- Marital Status: Married
- Languages: Hindi, English, Punjabi
- Address: Room no. 105, Venus House, IIT Ropar, Rupnagar-140001, Punjab, India.

Note: I, hereby, declare that the above information is true.

Date: 07/04/2015.

ISHA DHIMAN