CURRICULUM VITAE

Abhishek Choudhary

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EDUCATION

Rensselaer Polytechnic Institute (RPI), Troy, New York

Doctor of Philosophy *in Applied Mathematics, June 2019 (Expected)*

Indian Institute of Technology (IIT) Delhi, New Delhi, India

Integrated M. Tech. *in Mathematics & Computing, July 2013*

RESEARCH EXPERIENCE

Department of Mathematical Sciences, Rensselaer Polytechnic Institute

PhD Candidate*, May, 2015 – Present*

Advisor*:* Dr. Peter R. Kramer

Thesis: Stochastic Modeling of Intracellular Transport

Developed the mathematical framework of transport processes inside living cells using stochastic differential equations for molecular motor and cargo. Analytically obtained effective transport properties on a specified microtubule structure, namely ordered and disordered polarized networks commonly found in biological systems.

Department of Mathematics, Indian Institute of Technology

Master's Candidate*, August, 2012 – July 2013*

Advisor: Dr. Anuradha Sharma

Thesis: The MacWilliams Identity and Cluster-Correcting Codes

Studied different weight enumerators and respective MacWilliams identities for linear and non-linear codes. Analyzed and implemented construction models for two-dimensional codes, which could correct straight clusters of any given length and rectangular clusters containing up to 3 erroneous elements.

Institut National de Recherche en Informatique et Automatique (INRIA), France

Summer Visiting Researcher*, June-August 2012*

Supervisor: Dr. Melanie Herschel

Studied hybrid explanation algorithm Conseil for missing data as part of system Nautilus. Implemented the architecture for Data Flow in a general non-monotonous SQL Query and designed Data Provenance Model in Java along with creation of a dynamic user interface.

Department of Mathematics, Indian Institute of Technology

Research Assistant*, January-June 2012*

Supervisor: Dr. Aparna Mehra

Studied Decision theory in economic environment involving multiple criteria and stakeholders' choices. Implemented the outranking approaches ELECTRE III and PROMETHEE and built the platform for users to rank and analyze the alternatives with custom preferences.

TEACHING EXPERIENCE

Department of Mathematical Sciences, Rensselaer Polytechnic Institute

Teaching Assistant

Weekly recitations, office hours, grading assignments and tests, proctoring exams

- Multivariable Calculus & Matrix Algebra, August-December 2014
- Introduction to Differential Equations, January-May 2015
- Introduction to Differential Equations, May-July 2015
- Probability Theory and Applications, August-December 2015
- Introduction to Differential Equations, January-May 2016
- Numerical Computing, May-July 2016
- Foundations of Applied Mathematics, August-December, 2016
- Ordinary Differential Equations and Dynamical Systems, August-December 2016

Department of Mathematics, Indian Institute of Technology

Teaching and Laboratory Assistant

Content organization, leading discussion sessions, grading assignments and quizzes, proctoring

- Scientific Software Laboratory (Masters'), January-May, 2013

PROFESSIONAL ACTIVITIES

- *Mathematical Problems in Industry Workshop*, Claremont Center for Mathematical Sciences, California, June, 2018
- *Data Analytics Research Laboratory*, Rensselaer Polytechnic Institute, August-December, 2017
- *Graduate Student Mathematics Modeling Camp*, Rensselaer Polytechnic Institute, June, 2017
- *Joint NIMBioS-MBI-CAMBAM Summer Graduate Program Connecting Models with Biological Data*, University of Tennessee, Knoxville, Tennessee, June, 2017
- *Symposium on Probabilistic Modeling in Engineering and Science*, Lehigh University, Bethlehem, Pennsylvania, October 2016
- *SIAM Chapter Graduate Student Representative*, Rensselaer Polytechnic Institute, 2014-2015

HONORS AND AWARDS

- *SIAM Travel Award* for participation in the conference on Life Sciences, Society for Industrial and Applied Mathematics
- *SIAM Travel Award* for participation in the conference on Applications of Dynamical Systems, Society for Industrial and Applied Mathematics
- *EGIDE Scholarship* for pursuit of summer project in France, French Ministry of Foreign Affairs
- *MHRD Scholarship* for obtaining All India Rank 17 in GATE, Government of India

- *CSIR Program on Youth for Leadership in Science*, Central Electronics Engineering Research Institute (CEERI), Pilani, India
- *Mamraj Agrawal National Award* for academic excellence, Governor of State, Rajasthan, India

PUBLICATIONS

1. "First-Passage Time Simulation Method to Small Multidimensional Targets", Abhishek Choudhary, Peter R. Kramer, *In Preparation*
2. "Spatial Reattachment Model for Motor-Cargo Dynamics in Parallel Microtubule Network", Abhishek Choudhary, Peter R. Kramer, *In Preparation*
3. "Axonal Transport with Spatially Resolved Attachment and Detachment Model", Abhishek Choudhary, Peter R. Kramer, *In Preparation*

PRESENTATIONS

- Invited talk at *SIAM Conference on Life Sciences*, Minneapolis, Minnesota, August 7, 2018
- Talk at *Biology and Medicine Through Mathematics Conference (BAMM)*, Richmond, Virginia, May 31, 2018
- Speaker at *3rd Graduate Research Symposium (GRS)*, Rensselaer Polytechnic Institute, Troy, New York, March 24, 2018
- Seminar talk at *RTG Dynamical Systems forum* at Rensselaer Polytechnic Institute, Troy, New York, January 23, 2018
- Poster presentation at *Frontiers in Applied and Computational Mathematics*, Newark, New Jersey, June 24-25, 2017
- Poster presentation at *SIAM Conference on Dynamical Systems*, Snowbird, Utah, May 21-25, 2017.

TECHNICAL SKILLS

- Programming Languages: MATLAB, Java, C++, C#, LATEX, HTML, R, Python, SQL, PHP, JavaScript
- Software Packages: Eclipse, Oracle, Microsoft office (Word, Excel, Access etc.), DB2 Express, Dreamweaver, Visual Studio, RStudio

PROFESSIONAL ASSOCIATIONS

- Society for Industrial and Applied Mathematics (SIAM)
- American Mathematical Society (AMS)
- Society for Mathematical Biology (SMB)