Soumyendu Raha

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Work Experience

◇ **Department of Computational & Data Sciences (formerly academic section of SERC), Indian Institute of Science (IISc), Bangalore 560012, India**
Professor: July 25, 2015 - present.
Associate Professor: July 25, 2009 - July 24, 2015.
Assistant Professor: (tenured since July 25, 2008): July 25, 2003 - July 24, 2009.
Associated Faculty of the Interdisciplinary Mathematical Sciences Doctoral Program (msci.iisc.ac.in) since its inception in 2005

◇ **Computer Science Department, North Dakota State University, Fargo, ND, USA**
Assistant Professor, July 16, 2002 - June 23, 2003.

◇ **IBM Corporation Microelectronics Division, East Fishkill, NY, USA**
Advisory Software Engineer, May 31, 2000 - July 8, 2002. Worked on fab-qualified VLSI physical design (clock optimization) and circuit simulation algorithms.

◇ **Computer Science Department, University of California Santa Barbara, Santa Barbara, CA 93106, USA**
Lecturer [part-time] & Research Staff. 1997–2000

◇ **Cray Inc., Eagan, MN, USA (www.cray.com)**
Intern Member of Technical Staff, 1997-1998. Optimized the vector pipelines of the Multi-streaming Processor for Cray X1, the fastest supercomputer, circa 1999. Also participated in development of one of the first Tensor Processing Units.

Selected Academic Visits

◇ **Visiting Researcher, INSA de Rouen**, Rouen, France, July 2017.

◇ **Visiting Researcher, Institut für Stochastik, Johannes Kepler Universität**, Linz, Austria, October, 2013.

◇ **Visiting Researcher, Applied and Computational Mathematics, CalTech**, Pasadena, CA, USA, (under Indo-US Virtual Institute of Mathematical and Statistical Sciences Program), May 2013.

◇ **Visiting Researcher, McMaster University**, Hamilton, Canada, 19–22 July 2011.

◇ **OCCAM Visiting Fellow, Oxford Centre for Collaborative Applied Mathematics (OCCAM),** Mathematical Institute, University of Oxford, United Kingdom, 1 September – 30 November 2010 and 22–26 August, 2011.

◇ **Visiting Collaborating Researcher, Sobolev Institute of Mathematics**, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia, 14-30 July 2009 and 12-17 September, 2011. Repeat visits in Summer/Fall of 2018 & 2019.

◇ **Visiting Researcher, Nagoya University**(Centre of Excellence in Computational Science), Nagoya, Japan, 15-29 May 2005

Selected Research Grants

◇ **Ministry of Electronics and Information Technology (MEITY), Government of India**. *Verification, Validation and Prototyping of REDEFINE many-core IP for acceleration of Al-ML applications* under Chips to Startup Programme, initially for 1 year starting July-August 2023. Administrative approval issued on 18 May 2023.

⋄ **Science and Engineering Research Board, Government of India**, *Data Assimilation To Reaction-Diffusion Complex Networks*, MATRICS grant, Jan 2021-Jan 2024.

⋄ **Science and Engineering Research Board, Government of India**, *Containment Control over Economics Aware Local COVID-19 Infection Dynamics Networks*, MATRICS Special Grant, Jul 2020 – Jul 2021.

⋄ **Indian Space Research Organization, RESPOND Grant**, *Data Assimilation to Space Dynamical Systems with Application to High Accuracy Orbital Estimation for the IRNSS Satellites*, as Principal Investigator. December 2017 to May 2019. (completed)

⋄ **Science and Engineering Research Board, Government of India**, *Simulation, Control and Estimation of Path Constrained Stochastic Dynamics*, as Principal Investigator, March 2017–March 2020. (completed)

⋄ **Defense Research and Development Organization**-Naval Research Board, Government of India, *Computational Methods for Control of Multiscale Dynamics*, as Principal Investigator, January, 2012–January, 2015. (Completed)

⋄ **Department of Science and Technology**:International Collaboration with Johannes Kepler Universität, Linz, Austria. Stability Issues in Computation of Stiff Stochastic Differential Equation Systems. 2013-2015. (Completed).

⋄ **Jointly funded by Department of Science and Technology in India and Russian Foundation of Basic Research in Russia**, with the Sobolev Institute of Mathematics, Russian Academy of Sciences, Novosibirsk, Russia; *Mobile Intelligent Wireless Sensor Networks: Control and Optimization*, as Principal Investigator, 1 April 2010-31 March 2012. (Completed)

Selected Industrial Interaction

⋄ Fujitsu-IISc Lab for Data Science on Chips. CSR initiative with Fujitsu, Japan. MoU signed on 22 May 2024. This will support Data Science on Chips Lab at the CDS, IISc. 5 years' collaboration expected.

⋄ On IR Drop Estimation, AMD Reseach, Banglaore. May 2023 onwards for 3 years.

⋄ Honorary Technical Adviser, Tejosma Technologies, Bangalore, January 2013- December 2018.

Research Advisees

⋄ **As Main or Sole Doctoral Advisor:**

⋄ Surya Ratna Prakash Dumpa; External PhD Candidate from Indian Space Research Organization, in Computational & Data Sciences. Organizational Co-advisor: Dr P Veeramuthuvel. Working on transient stability of satellite trajectories. Joined 2020. [Ongoing]

⋄ Dr. Nischal Karthik Mapakshi; PhD in Computational & Data Sciences. Working on Physically Informed Neural Networks; Thesis title: *Structure-Preserving Physics-Informed Neural Networks for Anisotropic Porous Media with Pressure-Dependent Viscosity*. Graduated November 2025. Initial Placement: CAMS R&D, Chennai.

⋄ Dr. Abhishek Ajayakumar; PhD in Computational & Data Sciences.Thesis title: *Sparsification of Reaction-Diffusion Dynamical systems on Complex Networks*. Graduated February 2024. Initial Placement: Fujitsu Research of India, Bengaluru

⋄ Dr. Suthar Sumit; PhD in Computational & Data Sciences.Thesis title:*Constrained Stochastic Differential Equations on Smooth Manifolds*. Graduated July 2023. Initial Placement: Fujitsu Research of India.

⋄ Dr. Touseef Ahmad; PhD in Computational & Data Sciences. Thesis title:*Augmenting hyperspectral image unmixing models using spatial correlation, spectral variability, and sparsity*. Graduated in May 2023. Currently working with Space Application Centre, Ahmadabad of the Indian Space Research Organization as a Mathematician.

⋄ <u>Dr. Saurabh Dixit</u>; PhD in Computational & Data Sciences. Thesis title:*Prediction of Dynamical Systems by Constraining the Dynamics on the Observational Manifold.* Graduated in September, 2022. Initial Placement: Qualcomm, Bangalore.

⋄ <u>Dr Ashutosh Simha</u>; PhD in Computational & Data Sciences. Thesis: *Global control of mechanics on Riemannian manifolds, and applications to under-actuated aerial vehicles*, graduated in May 2018. Initially Postdoc with Technical University, Tallinn, Estonia. Post-doctoral researcher at TUDelft, Netherland.

⋄ <u>Dr. Tarun Uppal</u>; PhD in Computational & Data Sciences. External student from Defence Research & Development Organization. Organizational Co-adviser: Dr. Suresh Srivastava. Thesis: *Feasible Path Prescription for Engineering Systems in a High Index Constrained Dynamics Framework*; graduated in November, 2017. Employed as Scientist E in DRDO.

⋄ <u>Dr. Nigam Chandra Parida</u>; PhD in Computational Science & Engineering (SERC, IISc). [Thesis: *Simulation and Optimization of Dynamical Systems with High Index and Disjunctive Constraints.* Graduated in November, 2014. Assistant Professor at Odisha University of Agriculture & Technology, Bhubaneswar.]

⋄ <u>Dr. Radhamanjari Samanta</u>; interdisciplinary PhD in Nanoengineering for Integrated Systems (adviser: S. Raha & co-adviser: Prof Santanu Mahapatra (Electronic Systems Engineering)) [Thesis: *Timing-Driven Routing in VLSI Physical Design under Uncertainty*; graduated in December, 2013]. Initial Placement: AMD Bangalore. Currently with Intel, Bangalore.

⋄ <u>Dr. Samar Bahadur Singh</u>; interdisciplinary PhD in Mathematical Sciences (adviser: S. Raha & co-adviser: Prof. A. K. Nandakumaran (Mathematics)) [Thesis: *Study of Higher Order Split-Step Methods for Stiff Stochastic Differential Equations*; graduated in November, 2013]. Employed with Moody's Analytics, New York, USA. Past: Associate Vice-President with Copal Amba. Initial Placement: Visiting Faculty with Chennai Mathematical Institute, Chennai, India

⋄ <u>Dr. Saswati Dana</u>; interdisciplinary PhD in Mathematical Sciences (Math-Bio) (adviser: S. Raha & co-adviser: Prof Sujit K Sikdar (Molecular Biophysics)). Thesis: *Computational Studies of Uncertainty in Intra-Cellular Biochemical Reaction Systems;* graduated in December 2011. Initial Placement: Samsung Advanced Institute of Technology, Bangalore. Currently with IBM Research, Bangalore.

⋄ **As Doctoral Co-Advisor:**

⋄ <u>Dr. Deepa Mahesvare</u>, Thesis: *Modeling physiological transport at scales: connecting cells to organs*, PhD in Computational & Data Sciences; Main Adviser: Prof Debnath Pal & co-adviser: S Raha, Graduated June 2024. Initial Placement: Astra-Zeneca Research Lab, Bengaluru

⋄ <u>Dr. Saptarsi Das</u>, interdisciplinary PhD in Nano-engineering for Integrated Systems (co-adviser: S. Raha & main adviser: Prof S K Nandy). Thesis: *Reconfigurable Accelerator for High Performance Application Kernels*, graduated in May 2018. Employed with Samsung, Bangalore.

⋄ <u>Dr. Brahmanandam Javvaji</u>, interdisciplinary PhD in Nano-engineering for Integrated Systems (co-adviser: S. Raha & main adviser: Prof. D. Roy Mahapatra(Aerospace Engineering)). Thesis: *Plasmon-Phonon Coupled Dynamics of Nanocrystalline Structures*, graduated in March 2018.

⋄ <u>Dr. Ashish Kumar Pradhan</u>, interdisciplinary PhD candidate in Nano-engineering for Integrated Systems (co-adviser: S. Raha & main adviser: Prof S K Nandy). Thesis: *Energy Efficient Flexible Baseband Processing for Mobile and Cognitive Radios*; graduated in December 2017.

⋄ <u>Dr. Satadal Ghosh</u> interdisciplinary PhD in Mathematical Sciences (co-adviser: S. Raha & main adviser: Prof. Debasis Ghose (Aerospace Engineering)). Thesis: *Analysis of Pro-*

portional Navigation Class of Guidance Laws against Agile Targets, graduated December, 2014. Assistant Professor at IIT Madras.

⋄ Dr. Santosh Doraisamy, interdisciplinary PhD in Nanoengineering for Integrated Systems (co-adviser: S. Raha & main adviser: Prof Rudra Pratap (Nano-science and engineering)). Thesis:*A Study of Mode Dependent Energy Dissipation in 2D MEMS Resonators*; graduated in October, 2014

⋄ Dr. Sudarshan Iyengar, PhD Thesis: *Network Centrality Measures And Their Applications*, Interdisciplinary Program in Mathematical Sciences; graduated in 2012; Main Adviser: Prof. Veni Madhavan, C E (Computer Science); co-adviser: S. Raha. Assistant Professor at IIT Ropar

⋄ Dr. Kalidas Yeturu, PhD Thesis: *A Novel Algorithmic Suite for Detection, Large Scale Comparison and Design of Ligand Binding Sites in Protein Structures*, SERC, IISc; graduated in 2011. Main adviser: Prof Nagasuma Chandra (Biochemistry), co-adviser: S Raha. Assistant Professor at IIT Tirupati

⋄ **Masters:**

⋄ Wupadrasta Raja Vikram Bhatt, MTech (Research), graduated in May, 2020. Worked on Stability Preserving Bisection Algorithms in Reaction-Diffusion Complex Networks. Employed with Microsoft India

⋄ Milind R, MSc Engineering by Research (graduated in July, 2014). Commonwealth Fellowship recipient. Initially employed with Center for Study of Science, Technology & Policy, Bangalore.

⋄ Vishal Metri, MSc Engineering by Research (graduated in December, 2013). Thesis titled *Stochastic chemical kinetics: A study on hTREK1 Potassium ion channel*; won the Marie Curie Fellowship for doctoral studies in Europe.

⋄ Deepak Rout, MSc Engineering by Research (graduated, May 2006) [employed with IT companies].

Post Doctoral Advisees

⋄ Dr. Pranali Roy Chowdhury (PhD from IIT Kanpur): Axis Bank PostDoctoral Fellow of the IISc. October 2025 onwards.

⋄ Dr Anindita Ganguly (PhD from Jadavpur University): Dr. D. S. Kothari Post-Doctoral Fellow of the UGC; Dec 2019–Dec 2022. At present Director of Technical Education, Government of West Bengal, India.

⋄ Dr Atendra Kumar (PhD from IIT Mandi): Dr. D. S. Kothari Post-Doctoral Fellow of the UGC; January 2020–March 2021. Initial Placement: Assistant Professor, NIT Srinagar

⋄ Dr. Dinesh Kumar (PhD from IIT Guwahati); National Board for Higher Mathematics Post Doctoral Fellow and later Dr. D. S. Kothari Post-Doctoral Fellow of the UGC; Jan 2017–Dec 2021. Currently Faculty Member of the NIIT University, Neemrana, Rajasthan, India.

⋄ Dr. Moitri Sen (PhD from IIT Kanpur); Dr. D. S. Kothari Post-Doctoral Fellow of the UGC; July, 2014–July 2016. [at present Assistant Professor at the National Institute of Technology, Patna]

⋄ Dr. Ruchi Nigam (PhD from IIT Roorkee); Dr. D. S. Kothari Post-Doctoral Fellow of the UGC; Jan, 2014 – Dec 2016. [currently self-employed as educational consultant in Mysore, Karnataka]

⋄ Dr. Nachiketa Mishra (PhD from IIT Madras); National Board for Higher Mathematics Fellow and later Dr. D. S. Kothari Post-Doctoral Fellow of the UGC; July 2011-July 2012. [initial placement: Assistant Professor of Mathematics at National Institute of Technology, Warangal; Currently faculty at IIITDM Kanchipuram]

◇ Dr. Raghuram Srinivasan (PhD from University of Cincinnati, Ohio, USA); 30 August 2010-31 July 2014.[Associate Professor and Head of ECE at MS Ramaiah University Bangalore]

◇ Dr. Rajendra K Ray (PhD from IIT Guwahati); April - December 2009. [at present Professor and Head of Mathematics at IIT Mandi]

◇ Dr. Sk Safique Ahmad (PhD from IIT Guwahati); January 2008 - January 2009. [at present Professor and former Head of Mathematics at IIT Indore]

Selected Services

◇ Speaker and Resource Person, Vaibhav Summit – High Performance Computing/Computational Science, 2020

◇ Visited City University Hong Kong to help with the exchange programme with IISc, September 2019

◇ Served on Doctoral Committee (as examiner for Kandidat and as observer for DSc) on Applied Mathematics, Sankt Peterburg State University, Russia, 2018-2019

◇ *Catalyzed and Helped sign MoU between IISc and Sankt Peterburg State University (Russia) and Russian Academy of Sciences (Transportation Institute - St Petersburg, Ershov Institute of Informatics - Novosibirsk, and Sobolev Institute of Mathematics - Novosibirsk) and the Novosibirsk State University, 2019-2020.*

◇ *Catalyzed the establishment of Computational and Data Sciences Department and Program (Syllabus, Hiring of New Faculty) at the Indian Institute of Science Education and Research Kolkata, 2020-2021 (ongoing). Department created in November 2020*

◇ *Framed Syllabus and helped establish Computational and Data Sciences (UG and PG) Program at the Mathematics Department, National Institute of Technology Karnataka, 2019. Passed in Senate in March 2019.*

◇ *Catalyzed the establishment of Mathematical and Computational Sciences Program at the Indian Association for Cultivation of Sciences, Kolkata. Helped in hiring new faculty, framed syllabi and initiated research. 2017. Council resolution in September 2017*

◇ Reviewer & Examiner of numerous PhD theses from IIT Kharagpur, Jadavpur University, Anna University, IIT Kanpur, IIT Jodhpur, Carleton University Ottawa Canada etc.

◇ Reviewer for journals such as Automatica, IEEE Transactions such as Intelligent Transportation Systems and Systems, Man and Cybernetics; Applied Mathematics & Computation, Measurement, SIAM SISC etc.

Education

◇ **Department of Computer Science and Engineering,
University of Minnesota, Minneapolis, MN 55455, USA
Ph.D.** in **Scientific Computation** with a minor in Aerospace Engineering, April, 2000.
  · Thesis Title: *Constraint Partitioning For Solution Of Path-Constrained Dynamic Optimization Problems*
  · Thesis Advisor: Prof. Linda Petzold [Currently with University of California Santa Barbara].

M.S. in **Computer Science**, December, 1997.

◇ **Civil Engineering Department, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India
Master of Technology** in Civil Structural Engineering, February, 1993.

◇ **Civil Engineering Department, Jadavpur University, Kolkata 700032, India
Bachelor of Civil Engineering (Honours)**, July, 1991.

◇ **Academic Awards**
  · Sommerfeld Graduate School Fellowship at University of Minnesota,
    Fall 1994-Spring 1995.
  · Graduate School Fellowship at Minnesota Supercomputer Institute, Summer 1996.

Publication in Peer-Reviewed Journals

⋄ Intrinsic stochastic differential equations and the extended Itô formula on manifolds
S Suthar, S Raha
Proceedings of the Royal Society of Edinburgh Section A: Mathematics, 1-33, 2025.

⋄ Improving surrogate model robustness to perturbations for dynamical systems through machine learning and data assimilation
A Ajayakumar, S Raha
Proceedings of the Royal Society A 481 (2315), 20250168

⋄ Kiphynet: an online network simulation tool connecting cellular kinetics and physiological transport
M Deepa Maheshvare, R Charaborty, S Haldar, S Raha, D Pal
Metabolomics 20 (5), 94, 2024

⋄ Dynamics of a single-strain and two-strain respiratory infection driven by travel on a metapopulation network
I Ghosh, SS Nadim, S Raha, D Pal
Nonlinear Dynamics 111 (22), 21371-21389, 2023.

⋄ A Pathway Model of Glucose-Stimulated Insulin Secretion in the Pancreatic-Cell
Deepa Maheshvare M., S Raha, M König, D Pal
Frontiers in Endocrinology 14, 1185656, 2023, doi: 10.3389/fendo.2023.1185656

⋄ Progression, detection and remission: evolution of chronic myeloid leukemia using a three-stage probabilistic model
S Pan, SP Chakrabarty, S Raha
Journal of Applied Mathematics and Computing 69 (2), 1541-1558, 2023.

⋄ Robust generalized bilinear model with weighted low-rank representation for hyperspectral image unmixing
T Ahmad, S Raha, RB Lyngdoh, AS Sahadevan, PK Gupta, A Misra
Journal of Applied Remote Sensing 16 (2), 024524-024524, 2022.

⋄ A Graph-Based Framework for Multiscale Modeling of Physiological Transport
M Deepa Maheshvare, S Raha, D Pal
Frontiers in Network Physiology, 1:802881. doi: 10.3389/fnetp.2021.802881, 2022

⋄ Stability aware spatial cut of metapopulations ecological networks
D Kumar, A Ajayakumar, S Raha
Ecological Complexity 47, 100948, 2021

⋄ Factorization of Boolean Polynomials: Parallel Algorithms and Experimental Evaluation
PG Emelyanov, M Krishna, V Kulkarni, SK Nandy, DK Ponomaryov, S Raha
Programming and Computer Software 47 (2), 108-118, 2021

⋄ Four-directional spatial regularization for sparse hyperspectral unmixing
T Ahmad, RB Lyngdoh, AS Sahadevan, S Raha, PK Gupta, A Misra
Journal of Applied Remote Sensing 14 (4), 046511, 2020.

⋄ A quantitative study on the role of TKI combined with Wnt/β-catenin signaling and IFN-α in the treatment of CML through deterministic and stochastic approaches
S Pan, S Raha, SP Chakrabarty
Chaos, Solitons & Fractals 133, 109627, 2020.

⋄ Robust Initial Satellite Orbit Determination method using a Modified Kalman Filter
S Potu, SK Anand, S Raha
The Journal of Navigation 72 (3), 528-538, 2019.

⋄ Partitioning a reaction–diffusion ecological network for dynamic stability
Dinesh Kumar, Jatin Gupta, S Raha
Proceedings of the Royal Society A 475 (2223), 20180524, 2019.

⋄ Patch clamp data driven stochastic modeling and simulation of hTREK1 potassium ion channel gating

V Metri, S Ghatak, S Raha, SK Sikdar
Chemical Physics 516, 182-190, 2019.

◇ Adaptive Control Based Harvesting Strategy for a Predator–Prey Dynamical System
Sen, M., Simha, A. & Raha S.
Acta Biotheoretica (2018). https://doi.org/10.1007/s10441-018-9323-1

◇ Efficient realization of householder transform through algorithm-architecture co-design for acceleration of QR factorization.
Merchant FA, Vatwani T, Chattopadhyay A, Raha S, Nandy SK, Narayan R.
IEEE Transactions on Parallel and Distributed Systems. 2018 Feb 7.
DOI: 10.1109/TPDS.2018.2803820

◇ Almost-Global Exponential Tracking of a Variable Pitch Quadrotor on SE (3)
A Simha, S Vadgama, S Raha
IFAC-PapersOnLine, vol. 50 (1), pp. 10268–10273, 2017.

◇ Geometric Methods in Analysis and Control of Implicit Differential Systems
A Simha, S Raha
Journal of the Indian Institute of Science, vol. 97 (3), pp 391–411, 2017.

◇ Numerical simulation of a glucose sensitive composite membrane closed-loop insulin delivery system
Shashi Bajaj Mukherjee, Debabrata Datta, Soumyendu Raha, Debnath Pal
Bioprocess and Biosystems Engineering, Volume 40, Issue 10, pp 1453–1462, 2017.

◇ Trajectory evaluation using path prescribed control of Unmanned Aerial Vehicle in Differential Algebraic Equations framework
Tarun Uppal, Soumyendu Raha and Suresh Srivastava
The Aeronautical Journal, Volume 121, Issue 1240, pp. 770–789, 2017.

◇ Accelerating BLAS and LAPACK via Efficient Floating Point Architecture Design
Farhad Merchant, Anupam Chattopadhyay, Soumyendu Raha, S. K. Nandy, Ranjani Narayan
Parallel Processing Letters, vol. 27 (03n04), 1750006, 2017.

◇ Length-Scale and Strain Rate Dependent Mechanism of Defect Formation and Fracture in Carbon Nanotubes Under Tensile Loading
Brahmanandam Javvaji, D Roy Mahapatra and Soumyendu Raha
Journal of Nanoparticle Research 19(2), 37, 2017.

◇ Inverse Simulation for Gas Turbine Engine Control through Differential Algebraic Inequality Formulation
Uppal, Tarun, Soumyendu Raha, and Suresh Srivastava
DOI: https://doi.org/10.1515/tjj-2016-0057, International Journal of Turbo & Jet-Engines, October 2016.

◇ Unified Time-to-Go Algorithms for Proportional Navigation Class of Guidance
Satadal Ghosh, Debasish Ghose, and Soumyendu Raha
Journal of Guidance, Control, and Dynamics, Ahead of Print : pp. 1-18, (doi: 10.2514/1.G001472), April, 2016.

◇ Composite guidance for impact angle control against higher speed targets
Satadal Ghosh, Debasish Ghose and Soumyendu Raha
Journal of Guidance, Control, and Dynamics, Vol. 39, No. 1, pp. 98-117, 2016 .

◇ Time-Scales of the Stick-Slip Dynamics of the Peeling of an Adhesive Tape
Nachiketa Mishra, Nigam Chandra Parida, Soumyendu Raha
Proceedings of the Royal Society of London A, 2015, 20140399.
http://dx.doi.org/10.1098/rspa.2014.0399

◇ A Provably Tight Delay-Driven Concurrently Congestion Mitigating Global Routing Algorithm

Radhamanjari Samanta; Adil I Erzin; Soumyendu Raha; Yuriy V Shamardin; Ivan I Takhonov; V V Zalyubovskiy
Applied Mathematics and Computation, DOI: 10.1016/j.amc.2014.11.062, November 2014

⋄ Capturability Analysis of a 3-D Retro-PN Guidance Law for Higher Speed Nonmaneuvering Targets
Satadal Ghosh, Debasish Ghose, Soumyendu Raha
Control Systems Technology, IEEE Transactions on, (2014), Volume:22 , Issue: 5, pp. 1864–1874

⋄ Performance metrics in a hybrid MPI–OpenMP based molecular dynamics simulation with short-range interactions.
Pal, Anirban, Abhishek Agarwala, Soumyendu Raha, and Baidurya Bhattacharya,
Journal of Parallel and Distributed Computing 74.3 (2014): pp.2203-2214.

⋄ Capturability of Augmented Pure Proportional Navigation Guidance Against Time-Varying Target Maneuvers.
Ghosh, Satadal, Debasish Ghose, and Soumyendu Raha
Journal of Guidance, Control, and Dynamics, 37.5 (2014): pp. 1446-1461.

⋄ Rollover-Preventive Force Synthesis at Active Suspensions in a Vehicle Performing a Severe Maneuver With Wheels Lifted Off.
Parida, Nigam Chandra, Soumyendu Raha, and Anand Ramani.
Intelligent Transportation Systems, IEEE Transactions on (2013), DOI:10.1109/TITS.2014.2319263

⋄ Five stage Milstein methods for SDEs
Samar B Singh and S. Raha
International Journal of Computer Mathematics, doi:10.1080/00207160.2012.657629, vol. 89, issue 6, pp. 760-779, 2012.

⋄ Physically Consistent Simulation of Mesoscale Chemical Kinetics: the Non-Negative FIS-alpha Method
Saswati Dana and Soumyendu Raha,
Journal of Computational Physics, doi:10.1016/j.jcp.2011.07.032, vol. 230, pp. 8813-8834, 2011.

⋄ Growing pseudo-eigenmodes and positive logarithmic norms in rotating shear flow
Banibrata Mukhopadhyay, Ranchu Mathew, Soumyendu Raha
New Journal of Physics, vol. 13, 023029, Feb 2011.

⋄ Activator induced dynamic disorder and molecular memory in human two-pore domain hTREK1 K+ channel
Tapan K. Nayak, Saswati Dana, Soumyendu Raha, Sujit K. Sikdar
Journal of Chemical Biology, doi:10.1007/s12154-010-0053-3, Volume 4, Issue 2, pp 69-84, 2011.

⋄ Computation of Restoration of Ligand Response in the Random Kinetics of a Prostate Cancer Cell Signaling Pathway
S. Dana, T. Nakakuki, M. Hatakeyama, S. Kimura, S. Raha
Computer Methods and Programs in Biomedicine, doi:10.1016/j.cmpb.2010.04.001, vol. 101, pp.1-22, 2011.

⋄ On Estimation of Transient Stochastic Stability of Linear Systems
Sk. Safique Ahmad; Nagalinga Rajan; Soumyendu Raha,
Stochastics and Dynamics, doi 10.1142/S0219493710003017, Volume 10, Issue 3, pp. 385-405, September 2010.

⋄ An Efficient Reduction Algorithm for Computation of Interconnect Delay Variability for Statistical Timing Analysis in Clock Tree Planning
S. Bondada, S. Mahapatra, S. Raha
Sadhana, Academy Proceedings in Engineering Science, Vol. 35, Part 4, pp. 407 August 2010

◇ An Implicit Method for Some NSDDEs of Itô's Form
S. Singh & S. Raha
Journal of Numerical Mathematics and Stochastics,2 (1) : 45-53, 2010

◇ The α Method for Solving Differential-Algebraic Inequality Systems
Joey Peter, Nigam C. Parida and S. Raha
International Journal of Numerical Analysis and Modeling (IJNAM), Volume 7, Number 2, pp. 240-260, 2010.

◇ The Fully Implicit Stochastic-α Method for Stiff Stochastic Differential Equations
Sk. Safique Ahmad, Nigam C Parida and S. Raha
Journal of Computational Physics, vol. 228, pp. 8263–8282, 2009.
DOI: 10.1016/J.JCP.2009.08.002

◇ Regularized Numerical Integration of Multibody Dynamics with the Generalized α Method
Nigam C Parida and S. Raha
Applied Mathematics and Computation, vol. 215 pp. 1224–1243, 2009.
DOI:10.1016/J.AMC.2009.06.063

◇ Power-aware speed-up for multithreaded numerical linear algebraic solvers on chip multi-core processors.
Jayanta Mukherjee and Soumyendu Raha,
Scalable Computing: Practice and Experience (formerly Parallel and Distributed Computing Practices), vol. 10, no. 2, pp. 217–228, June 2009

◇ The α-Method Direct Transcription in Path Constrained Dynamic Optimization,
Nigam Chandra Parida and Soumyendu Raha,
SIAM J. Sci. Computing, Volume 31, Issue 3, pp. 2386–2417, 2009
PERMALINK: HTTP://DX.DOI.ORG/10.1137/070682289

◇ The Stochastic-α Method: A Numerical Method for Simulation of Noisy Second Order Dynamical Systems,
Nagalinga Rajan and Soumyendu Raha,
CMES: Computer Modeling in Engineering and Sciences, Vol. 23, No. 2, pp. 91-116, 2008

◇ Parallel implementation of AutoDock,
P. Khodade, R. Prabhu, N. Chandra, S. Raha and R. Govindarajan,
J. Appl. Cryst. 40, pp. 598-599, 2007.

◇ Processing Multimode Binding Situations in Simulation-Based Prediction of Ligand-Macromolecule Affinities
Khandelwal, A., Lukacova, V., Kroll, D.M., Raha, S., Comez, D., and Balaz, S.,
J. Phys. Chem. A.; (Communication); 2005; 109(29); pp. 6387-6391.

◇ A Comparison of the Binding Sites of Matrix Metalloproteinases and Tumor Necrosis Factor- Converting Enzyme: Implications for Selectivity
Viera Lukacova, Yufen Zhang, Daniel M. Kroll, Soumyendu Raha, Dogan Comez, and Stefan Balaz
J. Med. Chem.; (Article); 2005; 48(7); 2361-2370. ASAP Article 10.1021/jm0491703 S0022-2623(04)09170-8 Web Release Date: March 2, 2005

◇ A Combination of Docking, QM/MM Methods, and MD Simulation for Binding Affinity Estimation of Metalloprotein Ligands
Akash Khandelwal, Viera Lukacova, Dogan Comez, Daniel M. Kroll, Soumyendu Raha, and Stefan Balaz
J. Med. Chem., 48 (17), 5437 -5447, 2005. 10.1021/jm049050v S0022-2623(04)09050-8 Web Release Date: July 26, 2005

◇ Simulation-Based Predictions of Binding Affinities of Matrix Metalloproteinase Inhibitors
Akash Khandelwal, Viera Lukacova, Daniel M. Kroll, Dogan Comez, Soumyendu Raha, Stefan Balaz

Molecular Informatics/Combinatorial Science Volume 23, Issue 9 , Pages 754 - 766 Published Online: 15 Nov 2004.

◇ Similarity of Binding Sites of Human Matrix Metalloproteinases
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J. Biol. Chem., Apr 2004; 279: 14194 - 14200 ; 10.1074/jbc.M313474200.

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