

Ritwik Kumar Layek

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INTERESTS Systems Biology, Control Theory

EDUCATION • PhD, Dept. of ECE, Texas A&M University, College Station, USA (2007-2012)
• Dual Degree, Dept. of E&ECE, IIT Kharagpur, India (2002-2007)

**JOURNALS
(Selected)**

1. J. Banerjee, **R. K. Layek**, S. K. Sasmal, and D. Ghosh, *Delayed evolutionary model for public goods competition with policing in phenotypically-variant bacterial biofilms*, *Europhysics Letters*, 126(1), 18002, 2019.
2. J. Banerjee, S. K. Sasmal, and **R. K. Layek**, *Supercritical and subcritical Hopf-bifurcations in a two-delayed prey-predator system with density-dependent mortality of predator and strong Allee effect in prey*, *BioSystems*, 180, 19-37, 2019.
3. A. Deshpande, and **R.K. Layek**, *Fault Detection and Therapeutic Intervention in Gene Regulatory Networks using SAT Solvers*, *BioSystems*, 179, 55-62, 2019.
4. H. Das, A. Deshpande, and **R. K. Layek**, *A Linear Formulation of Asynchronous Boolean Networks*, *IEEE Control Systems Letters*, 3(2), 284-289, 2019.
5. S. Samanta, **R. Layek**, S. Kar, S. Mukhopadhyay, and S. Chakraborty, *Transient drift of Escherichia coli under diffusing Step nutrient profile*, *Physical Review E*, 98(5), 052413, 2018.
6. S. Samanta, **R. Layek**, S. Kar, M.K. Raj, S. Mukhopadhyay, and S. Chakraborty, *Predicting Escherichia coli's chemotactic drift under exponential gradient*, *Physical Review E*, 96(3), 032409, 2017.
7. H. Das, and **R. K. Layek**, *Estimation of Delays in Generalized Asynchronous Boolean Networks*, *Molecular BioSystems*, 12, 3098-3110, 2016.
8. S. Sridharan, **R. Layek**, A. Datta and J. Venkatraj, *Boolean modeling and fault diagnosis in oxidative stress response*, *BMC Genomics*, 13(Suppl 6):S4, 2012.
9. **R. Layek**, A. Datta, M. Bittner and E. R. Dougherty, *Cancer Therapy Design Based on Pathway Logic*, *Bioinformatics*, 27(4), 548-555, 2011.
10. **R. K. Layek**, A. Datta and E. R. Dougherty, *From Biological Pathways to Regulatory Networks*, *Molecular BioSystems*, 7, 843-851, 2011.
11. **R. Layek**, A. Datta, R. Pal and E. R. Dougherty, *Adaptive Interventions in Probabilistic Boolean Networks*, *Bioinformatics*, 25, 2042-2048, 2009.

**CONFERENCES
(Recent)**

1. A. Deshpande, and **R. Layek**, *A Linear Approach to Fault Analysis in Boolean Networks*, *ACC*, Seattle, Washington, USA, May 2017.
2. J. Banerjee, T. Ranjan, and **R. Layek**, *Stability Analysis of Population Dynamics Model in Microbial Biofilms with Non-participating Strains*, *ACM-BCB*, Seattle, WA, USA, October 2016.
3. A. Deshpande, S. Samanta, H. Das, and **R. Layek**, *A Boolean Approach to Bacterial Chemotaxis*, *EMBC*, 6125-6129, Orlando, FL, USA, August 2016.
4. V. Pahuja, **R. Layek**, and P. Mitra, *Learning a Probabilistic Boolean Network Model from Biological Pathways and Time-series Expression Data*, *EMBC*, 1471-1475, Orlando, FL, USA, August 2016.

5. J. Banerjee, T. Ranjan, and **R. Layek**, *Dynamics of cancer progression and suppression: A novel evolutionary game theory based approach*, *EMBC*, 5367-5371, Milano, Italy, August 2015.
6. H. Das, and **R. Layek**, *Inference of asynchronous Boolean network from biological pathways*, *EMBC*, 3270-3274, Milano, Italy, August 2015.
7. **R. Layek**, H. Nounou, M. Nounou, A. Datta and S. P. Bhattacharyya, *A Measurement Based Approach for Linear Circuit Modeling and Design*, *CDC*, 3821-3826, Maui, HI, USA, December 2012.

PROJECTS (AS PI)

1. Whole cell modeling and simulation in bacterium escherichia coli (SGIGC) , INR 250 Lakhs, SRIC, IIT KHARAGPUR (2014-2017).
2. Modulation in bacterial chemotaxis: A systems biology approach (ISIRD), INR 28 Lakhs, SRIC, IIT Kharagpur (2014-2017).

TEACHING (SELECTED)

1. Digital Communication, Spring 2016-20
2. Network Theory, Autumn 2019
3. Analog Communication, Autumn 2016-18
4. Vision and Visualization, Spring 2014-2015
5. Systems Biology: Modelling and Control, Autumn 2013-2014
6. Digital Electronic Circuits, Autumn 2013

DOCTORAL AND MS GUIDANCE

1. Dr. Sibendu Samanta (2018)
2. Dr. Anuj Deshpande (2019)
3. Dr. Haimabati Das (2019)
4. Jeet Banerjee (2020)
5. Swarnadip Chatterjee (MS, 2020)

UG-PG STUDENTS (SELECTED)

1. Tanvi Ranjan, Dual Degree (2014-2016), (PhD, Harvard University)
2. Souradeep Chakraborty, MTech (2013-2015), (PhD, UC at Santa Barbara)

ACHIEVEMENTS (SELECTED)

1. Open Grand Challenge seed grant award (SGIGC), IIT Kharagpur, 2014.
2. Agilent best paper award, GENSIPS, San Antonio, TX, USA, 2011.
3. Best Paper of the session award, American Control Conference (ACC), 2009.

OTHER ACTIVITIES (SELECTED)

1. Departmental Time table in charge (2016-2020).
2. Department ERP Representative (2014-2020).
3. BTech Faculty Advisor (2012-2017).
4. Coordinator of Workshop on ‘Computational Systems Biology’ (2014).
5. New Subjects: ‘Systems Biology: Modeling and Control’, ‘Vision and Visualization’ (2013).

WEBSITE

<http://www.iitkgp.ac.in/departement/EC/faculty/ec-ritwik>