

INDRANIL GHOSH

School of Mathematical and Computational Sciences • Massey University • Palmerston North, 4442
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EDUCATION

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| Ph.D., Applied Mathematics Massey University | 2021-Present Palmerston North, 4442 |
| M.Sc., Physics Jadavpur University | 2018-2020 Kolkata-700032 |
| B.Sc., Physics Jadavpur University | 2015-2018 Kolkata-700032 |

JOURNALS

Indranil Ghosh, and David J. W. Simpson, **Renormalisation of the two-dimensional border-collision normal form.** *Int. J. Bifurcation Chaos* 32(12):2250181, 2022. <https://www.worldscientific.com/doi/10.1142/S0218127422501814>

Sishu Shankar Muni, Hammed Olawale Fatoyinbo, and *Indranil Ghosh*, **Dynamical effects of electromagnetic flux on Chialvo neuron map: nodal and network behaviors.** *Int. J. Bifurcation Chaos* 32(09):2230020, 2022. <https://www.worldscientific.com/doi/10.1142/S0218127422300208>

Indranil Ghosh, and David J. W. Simpson, **Robust Devaney chaos in the two-dimensional border-collision normal form.** *Chaos* 32, 043120 (2022). <https://aip.scitation.org/doi/10.1063/5.0079807>

Indranil Ghosh, **Quantum Game Theory: A comprehensive study.** {Part I <https://link.springer.com/article/10.1007/s12045-021-1168-2>} {Part II <https://link.springer.com/article/10.1007/s12045-021-1180-6>} {Part III <https://link.springer.com/article/10.1007/s12045-021-1193-1>} *Resonance* (2021).

CONFERENCE PROCEEDINGS

Hammed Olawale Fatoyinbo, Sishu Shankar Muni, *Indranil Ghosh*, Ibrahim Olatunji Sarumi, and Afeez Abidemi, **Numerical bifurcation analysis of improved denatured Morris-Lecar neuron model.** *2022 International Conference on Decision Aid Sciences and Applications (DASA)*. <https://ieeexplore.ieee.org/document/9765094>

Sarath Babu, *Indranil Ghosh*, and B. S. Manoj, **Effort: A New Metric for Roadside Unit Placement in 5G Enabled Vehicular Networks.** *5GWF'2020 Proceedings*. <https://ieeexplore.ieee.org/document/9221228>

PREPRINTS

Indranil Ghosh, Sishu Shankar Muni, and Hammed Olawale Fatoyinbo, **On the analysis of a time varying noise-modulated heterogeneous coupled network of Chialvo neurons under the influence of electromagnetic flux** <https://arxiv.org/abs/2206.04234>

Costas J. Efthimiou, Gregory DeCamillis, and *Indranil Ghosh*, **A physics-driven study of dominance space in soccer.** <https://arxiv.org/abs/2202.00414>

SOFTWARES

Indranil Ghosh, QGameTheory: Quantum Game Theory Simulator (v0.1.2). CRAN Repository, 2020. <https://cran.r-project.org/web/packages/QGameTheory/index.html>

BLOGS

Indranil Ghosh, Introduction to Mathematical Optimization (with Python). <https://indrag49.github.io/Numerical-Optimization/>

Indranil Ghosh, Introductory Football Data Analysis. <https://realsoccerexpand.netlify.app/>

RESEARCH AND WORK EXPERIENCE

Sirpi Products and Services Pvt. Ltd., Bangalore, India August 2020-December 2020.
Research Lead and SHEAR Project Lead (Remote)

Indian Institute of Space Science and Technology, Kerala, India. May 2019-June 2019.
Computer Science Intern

CONFERENCE PRESENTATIONS

The Bifurcation Structure Within Robust Chaos of Piecewise-Linear Maps May 2023
SIAM Conference on Applications of Dynamical Systems (DS23) *Poster (Upcoming)*

Introduction to mathematical optimization using Python February 2023
Python Delhi User Group Meetup, 2023 *Tutorial (Upcoming)*

Bifurcation structure of robust chaos in two-dimensional piecewise-linear maps December 2022
New Zealand Mathematical Society Colloquium, 2022 *Talk*

Bifurcation structure of robust chaos in 2D piecewise-linear maps November 2022
Dynamical Systems in NZ - Castaways, 2022 *Talk (E-poster)*

Unconstrained Numerical Optimization using Python August 2022
Kiwi Pycon XI, 2022 *Tutorial*

Dynamical Effects of Electromagnetic Flux on Chialvo Neuron Map: Nodal and Network Behaviors July 2022
SIAM Conference on the Life Sciences, 2022 *Talk*

Renormalisation of the Two-Dimensional Border-Collision Normal Form July 2022
SIAM Annual Meeting, 2022 *Talk*

Renormalisation of the Two-Dimensional Border-Collision Normal Form July 2022
NSW ANZIAM 2022 Mid-Year Conference, 2022 *Talk*

Dynamical effects of electromagnetic flux on Chialvo neuron map: nodal and network behaviors April 2022
BAMC, 2022 *Talk*

Renormalisation of the Two-Dimensional Border-Collision Normal Form February 2022
ANZIAM Annual Conference, 2022 *Talk*

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| Learn Football Data Analysis with Python PyCode Conference, 2021 | December 2021 <i>Talk</i> |
| Football (soccer) data analysis: A Pedagogic introduction PyCon Taiwan, 2021 | October 2021 <i>Talk</i> |
| An introduction to hands-on football data analysis in Python PyCon Espana, 2021 | October 2021 <i>Talk</i> |
| Football (soccer) data analysis: A pedagogic introduction PyConline AU, 2021 | September 2021 <i>Talk</i> |
| Introduction to Soccer Pass Network Analysis with Python PyOhio, 2021 | July 2021 <i>Thunder Talk</i> |
| Introducing a blog: Introductory Football Data Analysis EuroPython Conference, 2021 | July 2021 <i>Lightning Talk</i> |
| Using Python to start learning Unconstrained Numerical Optimization Algorithms Pycon Colombia, 2021 | June 2021 <i>Talk</i> |
| QGameTheory: An R package for teaching quantum computing and quantum game theory to students International Series of Online Research Software Events (SORSE) | April 2021 <i>Poster Presentation + Talk</i> |
| QGameTheory: A Quantum Game Theory Simulator written in R for teaching quantum computing and game theory to starting programmers and undergraduate students APS March Meeting 2021 | March 2021 <i>Poster Presentation</i> |
| Develop and Document Your First R Package Sirpi Products and Services Pvt. Ltd. | December 2020 <i>Talk</i> |
| Learn Lambda Calculus with Python Pycode Conference 2020 | December 2020 <i>Talk</i> |
| Teaching quantum computing and game theory with QGameTheory package Why R? 2020 Conference | September 2020 <i>Talk</i> |
| Introducing Lambda Calculus with Python Pycon Australia | September 2020 <i>Talk</i> |
| Quantum Game Theory with Julia: A computational analysis JuliaCon | July 2020 <i>Poster presentation</i> |
| Build Your Own Quantum Simulator With R The European R Users Meeting | June 2020 <i>Lightning talk</i> |
| A Computational Study of Sequential Deposition: A Dynamic Monte Carlo Process in Statistical Physics Flatlands and beyond (2019) – A meet on 2D materials | September 2019 <i>SNBNCBS, Kolkata, India</i> |

A Python implementation of Quantum Evolutionarily Stable Strategy Game, an interdisciplinary study of Quantum Computation and Game Theory in population biology
February 2019
SLAS Conference *Washington D. C, USA*

Analysis of Quantum Game Theoretic Models with a Python Simulator December 2018
SciPy India *IIT-B, Mumbai*

Analysis of Chaos Game Simulator in Pygame October 2018
International Conference on Complex Dynamical Networks, 2018 *ISI, Kolkata*

Computation of Analytic Structure Factor for Macromolecules June 2018
Research Topic of Statistical Physics to young Physicists, 2018 *SNBNCBS, Kolkata, India*

TUTORING/MARKING

Marking assistant for 160.101 (Calculus).
Marking assistant for 160.102 (Linear Algebra).

SKILLS

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| Softwares | Expert: R, Python, Fortran, git, \LaTeX , HTML, Markdown |
| Social | Twitter: @indraghosh314 , Github: https://github.com/indrag49 , |