

INDRANIL GHOSH

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EDUCATION

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

JOURNAL PUBLICATIONS

- [J1] *Indranil Ghosh*, Sishu Shankar Muni, and Hammed Olawale Fatoyinbo, **On the analysis of a heterogeneous coupled network of memristive Chialvo neurons**. To appear in *Nonlinear Dyn.*
- [J2] *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://doi.org/10.1142/S0218127422501814>
- [J3] 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://doi.org/10.1142/S0218127422300208>
- [J4] *Indranil Ghosh*, and David J. W. Simpson, **Robust Devaney chaos in the two-dimensional border-collision normal form**. *Chaos* 32, 043120 (2022). <https://doi.org/10.1063/5.0079807>
- [J5] *Indranil Ghosh*, **Quantum Game Theory - I**. *Resonance* 26, 671–684 (2021). <https://doi.org/10.1007/s12045-021-1168-2> . **Quantum Game Theory - II**. *Resonance* 26, 791–812 (2021). <https://doi.org/10.1007/s12045-021-1180-6>. **Quantum Game Theory - III**. *Resonance* 26, 939–951 (2021). <https://doi.org/10.1007/s12045-021-1193-1>.

PUBLICATIONS IN CONFERENCE PROCEEDINGS

- [C1] 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://doi.org/10.1109/DASA54658.2022.9765094>
- [C2] 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://doi.org/10.1109/5GWF49715.2020.9221228>

PREPRINTS

- [P1] Costas J. Efthimiou, Gregory DeCamillis, and *Indranil Ghosh*, **A physics-driven study of dominance space in soccer**. <https://arxiv.org/abs/2202.00414>

SOFTWARES

- [S1] *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 Optimiztion (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

Understanding the bifurcation structure of robust chaos in piecewise-linear maps using renormalisation. July 2023
ICDEA 2023 *Talk (Upcoming)*

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

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

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 *Invited 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*

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 Calculus.
Marking assistant for Linear Algebra.

SERVICE

Journal Referee

Chaos: An Interdisciplinary Journal of Nonlinear Science

SKILLS

Softwares	Expert: R, Python, Fortran, git, L ^A T _E X, HTML, Markdown
Social	Twitter: @indraghosh314, Github: https://github.com/indrag49 ,

REFERENCES

- [R1] *David J. W. Simpson* (Ph.D. Supervisor). *Email: d.j.w.simpson@massey.ac.nz <https://www.massey.ac.nz/~djwsimps>*
- [R2] *Robert McLachlan* (Ph.D. Co-supervisor). *Email: r.mclachlan@massey.ac.nz <https://www.massey.ac.nz/~rmclachl/>*