

Mousumi Roy

Research Fellow, Saw Swee Hock School of Public Health, NUS, Singapore

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Research Experiences

- Research fellow, SSHSPH, NUS (04.09.2023 - present)
- Research Associate (17.01.2022 - 21.10.2022)
- Senior Research Fellow (30.01.2019 - 3.12.2021)
- Junior Research Fellow (30.01.2017 - 29.01.2019)

Education

- **Ph.D.** in Applied Mathematics (2022)
University of Calcutta, Kolkata, India
Thesis Title: Emergent Properties of Coupled Neuronal Systems.
- **M.Sc.** in Applied Mathematics (2014)
University of Calcutta, Kolkata, India
- **B.Sc.** in Mathematics (2012)
University of Calcutta, Kolkata, India

Technical skills

- **R, Python, MATLAB** for numerical simulation, data analysis.
- **GIMP** for editing figures.
- **QGIS** for map visualization.

Research Interest

- Infectious disease modelling
- Human mobility patterns
- Bayesian hierarchical modelling
- Renewal process
- Machine learning

Research Publications:

- **Mousumi Roy, Hannah E Clapham, Swapnil Mishra. Incorporating human mobility to enhance epidemic response and estimate real-time reproduction numbers.** medRxiv. Doi : 10.1101/2025.04.25.25326411 (2025)

- **Mousumi Roy**, Swarnendu Mondal, Chittaranjan Hens, Awadhesh Prasad, Nikolay Kuznetsov, Manish Dev Shrimali. **Model-free prediction of multistability using echo state network**. Chaos, 32, 101104 (2022).
- **Mousumi Roy**, Abhishek Senapati, Swarup Poria, Arindam Mishra, Chittaranjan Hens. **Role of assortativity in predicting burst synchronization using echo state network**. Physical Review E. 105, 064205 (2022).
- **Mousumi Roy**, Swarup Poria, Chittaranjan Hens. **Assortativity induced explosive synchronization in a complex neuronal network**. Physical Review E. 103, 062307 (2021).
- **Mousumi Roy**, Swarup Poria. **Enhancement of synchronized chaotic state in a delay-coupled complex neuronal network**. Nonlinear Dynamics. 102, 745 (2020).

Scholarship, Fellowship:

- Senior Research Fellowship, Council of Scientific & Industrial Research (UGC), India, 2019- 2021.
- Junior Research Fellowship, Council of Scientific & Industrial Research (UGC), India, 2017- 2018.
- INSPIRE Scholarship, India, 2010-2014.

Schools and Conferences attended:

- Delivered an oral presentation at **IDM2024** in Bangkok.
- Presented poster at **OPTIONS XII** in Australia.
- Attended and presented poster at **MIDSEA Summer School 2024** in Vietnam.
- Presented poster at **‘Tipping Points in Complex Systems (HYBRID) - ICTS’** held at ICTS, Bangalore, India.
- Delivered a short talk at the discussion meeting on **‘Neuroscience, Data Science and Dynamics (ONLINE)’** at ICTS, Bangalore, India.
- Delivered a lightning talk at **‘NETWORKS 2021’** through **WiNS (Women in Network Science)**.
- Presented a poster at **12th conference on Dynamical Systems Applied to Biology and Natural Sciences (‘DSABNS 2021-virtual’)**.