Complex Networks in Motion

4th International Workshop on Dynamical Networks

Book of Abstracts

14–16 September 2026
Coastal University, Porthaven

The open-source LaTeX template used to typeset this booklet, AMCOS_booklet, is available at
`https://github.com/maximelucas/AMCOS_booklet`.

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About

The workshop

Complex Networks in Motion brings together researchers studying how networked systems evolve over time — from neural populations to power grids — with a focus on methods that combine dynamical-systems theory with network inference from data.

Organizing committee

Amara Okafor	Diego Fontan	Ines Larsen
Bo Lindqvist	Farah Haddad	Jian Wu
Camille Dubois	Grace Muthoni	Karim El-Sayed

Timetable

KL: Keynote Lecture, IS: Invited Speaker, CT: Contributed Talk.

9:00	**Registration & Coffee**		
9:30	KL	**Sofia Ramirez** Coastal University	Synchronisation in adaptive networks
10:30	IS	**Tomasz Nowak** Baltic Institute	Inferring coupling from time series
11:15	**Coffee Break**		
11:30	CT	**Priya Anand** Delta Tech	A spectral test for hidden community structure
12:00	CT	**Liu Wei** Northshore Institute	Delay-coupled oscillators on random graphs

List of Abstracts — Talks

Monday 14th

Synchronisation in adaptive networks

S. Ramirez, Coastal University, Porthaven

KL

We study networks whose coupling weights adapt in response to the synchrony of the nodes they connect, a mechanism observed in both neural plasticity and power-grid load balancing. We derive a reduced set of equations for the joint evolution of phase and weight dynamics, and show that adaptive coupling can stabilise partial synchrony states that are unstable under fixed coupling. Numerical continuation confirms the prediction on networks of up to 200 Kuramoto oscillators.

Inferring coupling from time series

T. Nowak, Baltic Institute, Gdynia

IS

Reconstructing the interaction structure of a dynamical network from observed trajectories alone is a central inverse problem in network science. We compare three inference methods — transfer entropy, Granger causality, and a phase-response-curve-based estimator — on synthetic data with known ground truth, and report substantial sensitivity to observation noise and sampling rate that is rarely discussed in application papers.

Monday 14th, continued

A spectral test for hidden community structure

P. Anand, Delta Tech, Bengaluru **CT**

We propose a spectral statistic, computed from the normalized graph Laplacian, that distinguishes networks with planted community structure from Erdős–Rényi null models at sample sizes where modularity-based tests lose power. The statistic requires no prior estimate of the number of communities.

Delay-coupled oscillators on random graphs

L. Wei, Northshore Institute, Shanghai **CT**

Transmission delays between coupled oscillators are unavoidable in physically extended networks. We characterise how delay interacts with random graph topology to produce multistability between in-phase and splay states, and give an analytic condition, in terms of the graph's spectral gap, for the in-phase state to remain the unique attractor.

List of Posters

Epidemic spreading with heterogeneous recovery rates
J. Almeida, *Riverside College*

Community detection under partial observability
H. Park, *Northshore Institute*

A dataset of intercity mobility networks, 2018–2025
M. Haile, *Delta Tech*

Useful Information

Venue. All sessions take place in the Bayview Lecture Hall, Coastal University.

Wi-Fi. Network `CU-Guest`, no password required.

Lunch. Served daily in the adjacent Refectory, 12:30–13:30.