

School on Fundamentals of Complex Networks and Applications to Neuroscience

Fundamentals of Complex Networks						
Week 1	Monday Sept. 28	Tuesday Sept. 29	Wednesday Sept. 30	Thursday Oct. 1	Friday Oct. 2	Saturday and Sunday Oct. 3 and 4
8:00 - 9:00	Registration					FREE
9:00- 10:45	Welcome (H. Cerdeira, J. Buldú & S. Boccaletti)	Structure of Complex Networks (E. Estrada)	Random Walks (E. Nicosia)	Synchronization Transitions in the Kuramoto model (N. Araujo)	Percolation theory in networks (N. Araujo)	
10:30 - 10:45	Int. to Networks (E. Estrada) (at 9:40)	Coffee	Coffee	Coffee	Coffee	
10:45 - 12:15	Coffee (at 11:15)	Structure of Complex Networks (E. Estrada)	Social Dynamics: Opinion Formation in Networks (E. Nicosia)	The Master Stability Function (S. Boccaletti) by SKYPE	Epidemic Models in Networks (J. Gardeñes)	
12:15 - 14:00	Int. to Networks (E. Estrada) (at 11:30) Lunch (at 13:00)	Lunch	Lunch	Lunch	Lunch	
14:00 – 15:15	Work in groups (at 14:30)	Network phase transitions (E. Nicosia)	IFT/SAIFR Colloquium TBA (Tiago Pereira)	Structure and robustness of network infrastructures (N. Araujo)	Student's seminars	
15:15 – 15:45	Coffee (at 16:30)	Coffee	Coffee	Coffee	Coffee	
15:45 – 19:00	Work in groups (at 17:00)	Work in groups	Communicability in complex networks (E. Estrada) Work in groups (at 17:15)	Work in groups	Student's seminars	

	Fundamentals of Complex Networks			Applications to Neuroscience		
Week 2	Monday Oct. 5	Tuesday Oct. 6	Wednesday Oct. 7	Thursday Oct. 8	Friday Oct. 9	Saturday and Sunday Oct. 10 and 11
9:00- 10:30	Multilayer Networks: Structure (E. Nicosia)	Evolutionary Game Theory I (J. Gardeñes)	Applications to Biology: from RNA to Brain Networks (J. Buldú)	An overview of single-cell and neural network models I (A. Roque)	Detecting and tracking cell assemblies II (A. Tort)	FREE
10:30 - 10:45	Coffee	Coffee (at 10:00)	Coffee	Coffee	Coffee	
10:45 - 12:15	Multilayer Networks: Dynamics (E. Nicosia)	Evolutionary Game Theory II (J. Gardeñes) (at 10:15) Applications to Social Networks: Music Networks (J. Buldú) (at 11:15)	Applications to Biology: from RNA to Brain Networks (J. Buldú)	Detecting and tracking cell assemblies I (A. Tort)	An overview of single- cell and neural network models II (A. Roque)	
12:15 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch	
14:00 – 15:15	Complex Network Analysis on Neglected Diseases: A solution for Public Health (R. Sampaio)	Connecting networks (J. Buldú)	IFT/SAIFR Colloquium Recovering evolutionary history by complex network modularity analysis (R. Andrade)	Student's presentations I Coffee (at 4:00)	Discussion new set of works	
15:15 – 15:45	Coffee	Coffee	Coffee		Coffee	
15:45 – 19:00	Work in groups	Work in groups	Work in groups	Student's presentations II	Work in groups	

	Applications to Neuroscience				
Week 3	Monday Oct. 12	Tuesday Oct. 13	Wednesday Oct. 14	Thursday Oct. 15	Friday Oct. 16
9:00- 10:30	Collective neuronal phenomena I (M. Copelli)	Neuroimages techniques and mental illnesses I (E. Amaro Jr.)	Using machine learning to explore neural data sets (R. Vicente)	Collective neuronal phenomena II (M. Copelli)	Collective neuronal phenomena III (M. Copelli)
10:30 - 10:45	Coffee	Coffee	Coffee	Coffee	Coffee
10:45 - 12:15	Cross-frequency coupling between brain rhythms (A. Tort)	Neuroimages techniques and mental illnesses II (E. Amaro Jr.)	Magnets, machines, brains (R. Vicente)	Sustained Activity in a layered spiking cortical model (A. Roque)	Deep learning (R. Vicente)
12:15 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch
14:00 – 15:15	Zero lag and anticipated synchronization in neuronal circuits (C. Mirasso)	Neuroimages techniques and mental illnesses III (E. Amaro Jr.)	ICTP/SAIFR Colloquium Information Processing with neuro-inspired delay-based nonlinear systems (C. Mirasso)	Students seminars	Student's presentations I Coffee (at 4:00)
15:15 – 15:45	Coffee	Coffee	Coffee	Coffee	Student's presentations II
15:45 – 19:00	Work in groups	Students seminars	Work in groups	Work in groups	