Titulo:

Anticipated synchronization or how to gain time

Coloquialista:

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Resumo:

Synchronization has been extensively studied in many complex systems including the brain, where it has been hypothesized to be relevant to issues such as the binding problem, temporal coding, deployment of spatial attention, higher cognitive functions, and many others. Among the different possible scenarios, that include identical synchronization, phase synchronization, generalized synchronization or lag synchronization among others, the latter is one of the most interesting especially when the lag is negative. This case was termed anticipated synchronization (AS) and is particularly counterintuitive when considering chaotic systems.
When two dynamical systems are connected such that one of them (the sender) strongly influences the other (the receiver), a positive phase (or time) lag is often expected if they synchronize. The assumption is that the time difference implicit in the relative phase reflects the transmission time of the interaction. However, it has been found cases for which a negative lag emerges, indicating that the transmission time is shaped by the interaction shortening the communication delay. In this talk I will review the main aspects of anticipated synchronization and show particular examples that occur in brain circuits.

Data, horário e local:

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