Fundamental limits of coded catching and distributed computing

Résumé du projet de recherche (Langue 1)

The thesis of Emanuele Parinello will take a feedback-information-theoretic view of distributed pre-storage as well as distributed computing, capitalizing on the fact that each method builds on the imperfections of the other. His aim will be to transform preemptive storage into a powerful cognitive ingredient that can adaptively change the informational structure of a variety of communication problems. This new synergy has the potential to entirely transform the way both memory-aided coded-multicasting and interference-management are perceived and used in wireless networks as well as in distributed computing settings.

Emphasis will be placed in memory-aided communications in topological networks, where the main idea is that we will explore how preemptive distributed-storage must adapt to different network topologies. Topology crucially lies at the core of how memory should be used: it defines the characteristics of the propagation of signals (interfering and not), it defines the extent to which feedback is a bottleneck, and in the end it defines the impact of every megabyte of memory.