Title: Reducing the Role of Network Topology in Average Consensus
Estimator Performance

Abstract:

Average consensus estimators allow agents in a network
to compute the mean of their individual inputs by communicating
with their neighbors. The network's structure strongly influences
the estimator's performance; thus an estimator that converges
quickly on one network may become unstable on another. We have
developed a separation principle that decouples estimator performance
from network topology. Using this principle, we design estimators
with guaranteed performance over a range of networks, even when
the exact network structure is unknown. In simulations over numerous networks,
these estimators exhibit consistent performance.