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Dynamic Networks in Behavioral Ecology: Baboons and Zebras as Mobile Social Users.

From gene interactions and brain activity to cellphone calls and zebras grazing together, large, noisy, and highly dynamic networks of interactions are everywhere. My application domain of choice, ecology, being the science of connections among living organisms and their environment, among different biological scales, from organisms to the planet, is particularly well positioned to take advantage of the network paradigm. Unfortunately, in this domain as in many others, our ability to analyze data lags substantially behind our ability to collect it.

In this talk I will show how some of the big questions in animal ecology can be answered using network analysis. I will show how abstract questions about dynamic interaction networks – what is a representative sample? is there an inherent time scale? what are the most parsimonious, significant, and meaningful patterns? – can be formulated as combinatorial or graph optimization problems and used to gain insight into and suggest hypotheses about individual and collective behavior of zebras, baboons, humans, and other animals.