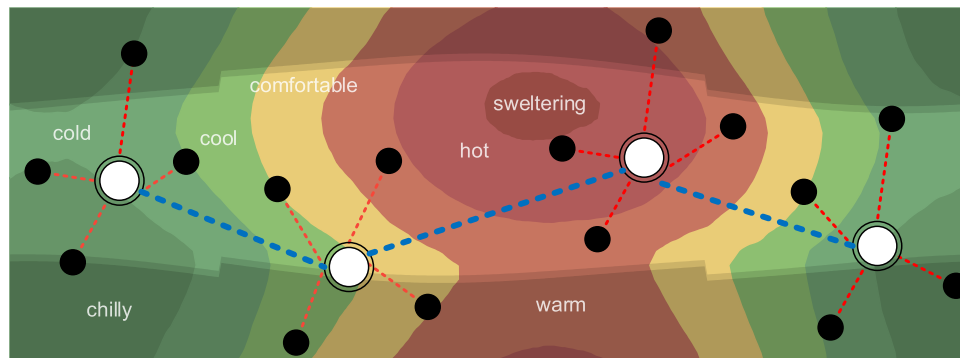


Structured Codes versus Unstructured Codes for Communication Networks: An information Theoretic Prospective

Abstract: Information theory has a compelling potential to change the way we live, work, and interact over the next several decades. Its impact ranges from the development of internet and social media, to the design of transportation systems, monitoring systems and medical devices. The unquenchable thirst of information networks for higher data rates seems to be never-ending. In the last decades, the solution to this growing demand has been to harvest resources such as bandwidth and power. The enormous size of modern networks renders this approach impractical. This imparts the need for the development of noble approaches for communication. This talk is dedicated to devising techniques for efficient communication over networks from the information theoretic perspective. I will discuss the concept of structured codes versus conventional unstructured codes, and introduce a new class of constructions called “quasi structured codes” that span the spectrum from completely structured to completely unstructured codes. These concepts are key elements for communication problems which are the building blocks of networks.



A sensor network to measure the temperature of an area.

Bio: Mohsen Heidari is a PhD. candidate in Electrical Engineering at the University of Michigan, Ann Arbor, MI, under the supervision of Prof. Sandeep Pradhan. He received the M.Sc. degree in Applied Mathematics from the University of Michigan, in 2017. Prior to joining Michigan, he received the B.Sc., and M.Sc. in Electrical Engineering from Sharif University of Technology, in 2011 and 2013. His research interests are in network information theory and coding, communication and signal processing. His work is mainly focused on the design of channel/source coding algorithms for multi-terminal communications, and on deriving information theoretic limits for the performance of such systems.