Abstract: In my talk, I discuss distributed graph algorithms in networks in which the nodes have a limited communication capacity. Many distributed systems are built on top of an underlying networking infrastructure, for example by using a virtual communication topology known as an overlay network. Although this underlying network might allow each node to directly communicate with a large number of other nodes, the amount of communication that a node can perform in a fixed amount of time is typically much more limited.

At SPAA 2019, we introduce the Node-Capacitated Clique model as an abstract communication model, which allows us to study the effect of nodes having limited communication capacity on the complexity of distributed graph computations. In this model, the n nodes of a network are connected as a clique and communicate in synchronous rounds. In each round, every node can exchange messages of $O(\log n)$ bits with at most $O(\log n)$ other nodes. When solving a graph problem, the input graph G is defined on the same set of n nodes, where each node knows which other nodes are its neighbors in G. We present distributed algorithms for the \emph{Minimum Spanning Tree} (MST), \emph{BFS Tree}, \emph{Maximal Independent Set}, \emph{Maximal Matching}, and \emph{Vertex Coloring} problem, some of which I will discuss in my talk.