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Karl R.B. Schmitt*, 1900 Chapel Dr, Gellersen Center, Valparaiso University, and **Linda Eroh, Henry Escudro, Raluca Gera** and **Samuel Prahlow**. *A Method of Approximating Cliques in Networks: k -dense*.

Motivated by the idea of community (or sub-graph) detection within a network/graph, we focused on finding characterizations of k -dense communities, introduced by Saito, Yamada and Kazama. In this research, we characterize which graphs are k -dense but not $(k+1)$ -dense for some values of k and study the minimum and maximum number of edges such graphs can have. Proofs of these minimum and maximums are built using enumerative combinatorics. A better understanding of k -dense sub-graphs (or communities) helps in the study of the connectivity of large complex graphs (or networks) in the real world. (Received August 10, 2015)