

Social networks have occurred naturally among people since the beginning of human civilization, and they are becoming more important than ever as people recognize their anthropological and commercial value. The topic of my research is to apply transfer learning to relational networks, such as social networks, by making reasonable assumptions of homogeneity among different regions. In application, I will focus on community detection using classification techniques, such as Gaussian processes. Traditionally, applying Bayesian inference or the method of maximum likelihood can solve classification problems of community detection. Bayesian inference often requires large numbers of computations from taking integrals to obtain predictive distributions. The method of maximum likelihood is a relatively quick process but runs the risk of finding unrepresentative solutions. Gaussian processes are a recent development as an alternative way of establishing the model by going directly into function space without finding parameters. This approach utilizes a nonparametric model to complete inference on the functions using the Gaussian marginalization property. I will implement Gaussian processes on real relational networks, such as environmental sustainability data sets and social networking data sets, as well as perform benchmark tests.