UNIVERSITY OF SOUTH FLORIDA

Defense of a Doctoral Dissertation

Scalable Unsupervised Learning with Game Theory
by
Alireza Chakeri

For the Ph.D. degree in Computer Science & Engineering

Recently evolutionary game theory has proven to be an effective tool for unsupervised learning and have found applications in different domains. In this dissertation, we present the difficulties and challenges associated with this model for large data sets. To overcome the limitations, after establishing necessary theoretical tools, we propose the scalable clustering game framework to cluster very large graphs. We also generalize the clustering game method to cluster uncertain data where the similarities between the data points are not exactly known, that leads to the uncertain clustering game framework. Additionally, we study the effect of the spectral sparsification method based on sampling by effective resistance on the clustering outputs. We show that the clustering results obtained from sparsified graphs are very similar to the results of the original non-sparsified graphs.

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