

Welcome Tutorial :-)

Tutorial 8

GAO Ming

SE & DaSE @ ECNU

Foundations of Data Science, 2016

Tutorial 8

- 1 Let L be the Laplacian of graph G of n vertices, please prove that the regularization term $\frac{1}{2} \sum_{i,j=1}^n A_{i,j} (f_i - f_j)^2 = F^T L F$, where $F \in \mathbb{R}^{n \times 1}$.
- 2 Let \mathcal{L} be the normalized Laplacian of a weighted graph G of n vertices, please prove that the regularization $\frac{1}{2} \sum_{i,j=1}^n w_{i,j} \left(\frac{f_i}{\sqrt{d_{ii}}} - \frac{f_j}{\sqrt{d_{jj}}} \right)^2 = F^T \mathcal{L} F$, where $F \in \mathbb{R}^{n \times 1}$.
- 3 Please extend the modularity to detect communities structures from directed graph and signed graph (encourage to read some papers).