

# Spectral Clustering

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## **Abstract**

Spectral clustering has become one of the most popular modern clustering algorithms. It is simple to implement, can be solved efficiently by standard linear algebra software, and very often outperforms traditional clustering algorithms such as the k-means algorithm. We will describe the necessary concepts needed to define spectral clustering, including the similarity matrix and various graph Laplacians. We will also touch briefly on the perturbation approach to spectral clustering and the eigengap heuristic for the number of clusters. We will illustrate spectral clustering with specific examples, so as to solidify our understanding of the algorithm and the related concepts.