Pattern Vectors with the Characteristic Coefficients

Asma Zeynali[*]　　　Dariush Kiani[†]　　　Sara Saeedi Madani[‡]

Abstract

We explore a method for clustering data coming from certain copies of several images. This method is based on certain pattern vectors arising from the characteristic polynomial of graphs associated with data together with the K-means clustering algorithm. The coefficients of the characteristic polynomial of graphs contain important information from the topology of the graph and these coefficients can be computed with tools from spectral graph theory. Graph-based methods have several applications in different fields, like computer vision and pattern recognition. In this paper, besides giving an overview on recent applications of the Ihara zeta function in clustering, we compare them with our method and demonstrate its effectiveness.

Keywords:　Characteristic coefficients, Pattern vectors and Clustering

---

[*]Department of Mathematics and Computer Science, Amirkabir University of Technology, Tehran, Iran, `azeynali@aut.ac.ir`

[†]Department of Mathematics and Computer Science, Amirkabir University of Technology, Tehran, Iran, `dkiani@aut.ac.ir`

[‡]Department of Mathematics and Computer Science, Amirkabir University of Technology, Tehran, Iran, `sarasaeedi@aut.ac.ir`