A Random-Matrices Framework for Nyström Method

Chii-Ruey HWANG Institute of Mathematics, Academia Sinica, Taipei, Taiwan 11529
E-mail:crhwang@sinica.edu.tw

Abstract: Calculating largest eigenvalues and the corresponding eigenvectors of a large positive definite matrix sometimes is difficult. Instead the underlying matrix is replaced by a lower rank one, the Nyström approximation. We try to give a justification for this practical method. Consider a fixed positive definite kernel $K(x, y)$ and an i.i.d. sequence of r.v.’s $X_i$. We study the limiting properties of largest eigenvalues and the corresponding eigenvectors got from the Nyström method applied on random matrices $[K(X_i, X_j)]_{1 \leq i, j \leq n}$. This is an ongoing work with Zhidong Bai, Lobin Chang, Su-Yun Huang.