

Enhancing Sparsity of Principal Components

H. T. Quyen¹ and D. D. X. Thanh²

Abstract: Sparse principal component analysis considers the problem of maximizing the variance explained by a particular linear combination of the input variables where the number of nonzero coefficients is constrained. This NP-hard problem has wide applications ranging from biology to finance. However, the output of existing methods do not satisfy the sparsity constraint in general. In this paper, we find the sparsest principal component analysis which explains a desired percentage of variance via a re-weighted l_1 minimization iteration and semidefinite relaxation techniques. Numerical results show that the method is efficient and reliable in practice.

¹ Department of Mathematics
Ho Chi Minh City University of Architecture
196 Pasteur Street, 3th District, HoChiMinh City, Vietnam
thucquyen911@yahoo.com

² Information Technology & Applied Mathematic Department
Ton Duc Thang University
98 Ngo Tat To Street, 19th Ward, Binh Thanh District, HoChiMinh City, Vietnam
thanhddx@tut.edu.vn