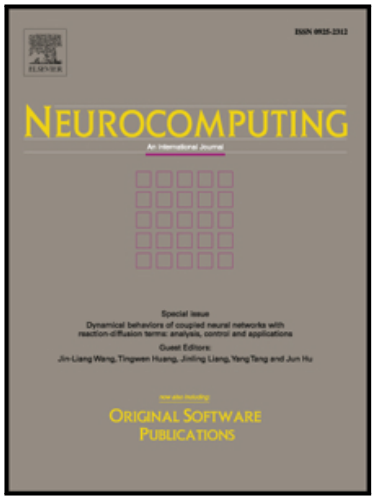
Communicated by Jiayu Zhou

Accepted Manuscript



Nuclear-norm Based Semi-supervised Multiple Labels Learning

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PII: S0925-2312(17)31558-8
DOI: 10.1016/j.neucom.2017.09.039
Reference: NEUCOM 18921

To appear in: *Neurocomputing*

Received date: 8 August 2016
Revised date: 13 May 2017
Accepted date: 12 September 2017

Please cite this article as: Yang Liu, Feiping Nie, QuanXue Gao, Nuclear-norm Based Semi-supervised Multiple Labels Learning, *Neurocomputing* (2017), doi: 10.1016/j.neucom.2017.09.039

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ACCEPTED MANUSCRIPT

Nuclear-norm Based Semi-supervised Multiple Labels Learning

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Abstract

Semi-supervised learning has received extensive attention in computer vision and machine learning community due to its applications in object detection and image classification. However, most existing multi-label semi-supervised learning methods artificially construct the category graph. This reduces the flexibility of algorithms. Moreover, it is difficult to select appropriate parameters due to the complex distribution of data in real applications especially when there are few labeled samples. To handle this problem, in this paper, we propose a novel nuclear-norm based semi-supervised learning framework for multi-label classification. To be specific, we employ nuclear-norm regularization for class-level smoothness to adaptively construct category graph in the criterion function. Thus, it effectively improves the classification performance. In addition, a non-greedy iterative algorithm is introduced to solve the criterion function, which has good convergence. Furthermore, based on the proposed framework, two novel nuclear-norm based algorithms are developed. Extensive experiments on three real-world datasets illustrate that our proposed method achieves better performance than some state-of-the-art multi-label learning algorithms.

Keywords: `semi-supervised`, `multi-label`, `nuclear-norm`

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