

# Author's Accepted Manuscript

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Graph Matching Algorithm

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PII: S0031-3203(16)30393-4  
DOI: <http://dx.doi.org/10.1016/j.patcog.2016.12.006>  
Reference: PR5978

To appear in: *Pattern Recognition*

Received date: 17 June 2015  
Revised date: 9 December 2016  
Accepted date: 10 December 2016

Cite this article as: Xu Yang, Hong Qiao and Zhi-Yong Liu, Point Correspondence By A New Third Order Graph Matching Algorithm, *Pattern Recognition*, <http://dx.doi.org/10.1016/j.patcog.2016.12.006>

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# Point Correspondence By A New Third Order Graph Matching Algorithm

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## Abstract

The correspondence between point sets is a fundamental problem in pattern recognition, which is often formulated and solved by graph matching. In this paper, we propose to solve the correspondence problem by a new third order graph matching algorithm. Compared with some previous hyper-graph matching algorithms, the proposed one achieves considerable memory reduction and is applicable to both undirected and directed graphs. Specifically, the correspondence is formulated by the matching between adjacency tensors encoding the third order structural information of each graph, which is then transformed to be a tractable matrix form. Two types of gradient based optimization methods, the graduated nonconvexity and concavity procedure (GNCCP) and graduated assignment (GA) algorithm, are generalized to solve the problem. Comparative experiments with state-of-the-art algorithms on both synthetic and real data witness the effectiveness of the proposed method.

*Keywords:* Graph matching, Point correspondence, High order constraints, Adjacency tensor

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