## **Accepted Manuscript**

Multi-Modal Self-Paced Learning for Image Classification

Wei Xu, Wei Liu, Xiaolin Huang, Jie Yang, Song Qiu

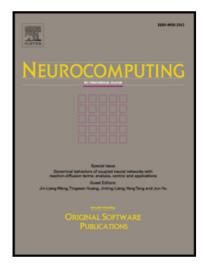
PII: \$0925-2312(18)30533-2

DOI: 10.1016/j.neucom.2018.04.075

Reference: NEUCOM 19552

To appear in: Neurocomputing

Received date: 6 December 2017 Revised date: 28 February 2018 Accepted date: 30 April 2018



Please cite this article as: Wei Xu, Wei Liu, Xiaolin Huang, Jie Yang, Song Qiu, Multi-Modal Self-Paced Learning for Image Classification, *Neurocomputing* (2018), doi: 10.1016/j.neucom.2018.04.075

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

#### ACCEPTED MANUSCRIPT

## Multi-Modal Self-Paced Learning for Image Classification

Wei Xu<sup>a,b,\*</sup>, Wei Liu<sup>a</sup>, Xiaolin Huang<sup>a</sup>, Jie Yang<sup>a,\*</sup>, Song Qiu<sup>c,\*</sup>

<sup>a</sup>Institute of Image Processing and Pattern Recognition, Shanghai Jiao Tong University
<sup>b</sup>Lab for Media Search, School of Computing, National University of Singapore
<sup>c</sup>School of Information Science Technology, East China Normal University, 500 Dongchuan Rd, Shanghai, 200241, P.R. China

#### Abstract

Self-paced learning (SPL) is a powerful framework, where samples from easy ones to more complex ones are gradually involved in the learning process. Its superiority is significant when dealing with challenging vision tasks, like natural image classification. However, SPL based image classification can not deal with information from multiple modalities. As images are usually characterized by visual feature descriptors from multiple modalities, only exploiting one of them may lose some complementary information from other modalities. To overcome the above problem, we propose a multi-modal self-paced learning (MSPL) framework for image classification which jointly trains SPL and multi-modal learning into one framework. Specifically, the multi-modal learning process with curriculum information and the curriculum learning process with multi-modal information are iteratively performed until the final mature multi-modal curriculum is learned. As this multi-modal curriculum can grasp the easy to hard knowledge from both the sample level and the modality level, a better model can be learned. Experimental results on four real-world datasets demonstrate the effectiveness of the proposed approach.

Keywords: Image classification, curriculum learning, self-paced learning,

 $Email\ addresses:\ {\tt xuronaweizida@gmail.com}\ (Wei\ Xu),\ {\tt liuwei.1989@sjtu.edu.cn}\ (Wei\ Liu),\ {\tt xiaolinhuang@sjtu.edu.cn}\ (Xiaolin\ Huang),\ {\tt jieyang@sjtu.edu.cn}\ (Jie\ Yang),\ {\tt sqiu@ee.ecnu.edu.cn}\ (Song\ Qiu)$ 

<sup>\*</sup>corresponding author

### Download English Version:

# https://daneshyari.com/en/article/6863690

Download Persian Version:

https://daneshyari.com/article/6863690

Daneshyari.com