A Crowdsourced Approach to Student Engagement Recognition in e-Learning Environments

WACV 2016

Aradhya Biswas*, Aditya Kamath*, Vineeth Balasubramanian#
*Georgia Institute of Technology, #Indian Institute of Technology Hyderabad
Introduction and Motivation

- Massively Open Online Course (MOOC) platforms such as Coursera, Udacity, have become very popular in recent times.
- Unlike traditional classroom environments, MOOCs facilitate only a one way communication from the teacher to student, but not the other way around.
- We attempt to solve the problem of engagement recognition of students taking MOOCs, which can be relayed as feedback to the teacher to improve the lectures.
Dataset

Motivation: No publicly available dataset

→ Crowdsourced
→ 3 levels of engagement
  ◆ Not engaged
  ◆ Nominally engaged
  ◆ Very Engaged
→ Real world
→ Mitigated hawthorne effect
→ Difficult
Motivation

- Existing commercial systems do not perform with desirable accuracy.
- Traditionally used, SVMs and MKL SVMs, achieve an average accuracy of 35% and 36.46%, respectively.
- The achieved accuracy is not sufficient for a realtime system, with these approaches to be incorporated into MOOCs.
Proposed Approach

- The confidence of a particular image being part of an engagement level can be viewed as the proportion of votes received for that level.
- In an attempt to incorporate this confidence value, our approach uses this value as instance weight to train an Instance weighted MKL SVM.
- The proposed methodology achieves, a 14% improvement on the dataset against traditional methods.
- With the most ambiguous class of the dataset ignored, the proposed method achieves a 46% improvement over the traditional methods.

Thank you!

Contact: (aradhya.biswas, adityakamath)@gatech.edu & vineethnb@iith.ac.in