

Project Idea

Automated Classroom Assessment Platform

Christof Teuscher

teuscher@pdx.edu

<http://www.teuscher-lab.com>

Project goals

- Develop an automated classroom assessment platform that uses one or several video recordings from a low-cost device, such as a phone, tablet, or action camera.
- The tool should be able to determine¹:
 - How many different instructional activities were used?
 - What was the pace of the lesson?
 - How much instructor-student and student-student interaction happened?
 - How many times did the instructor pause to ask questions?
 - How many times and for how long were small group discussions held?
 - How many times were video clips and demonstrations shown?

¹This is partly based on the Teaching Practices Inventory, <http://www.lifescied.org/content/13/3/552.full>

Existing platforms

Decibel Analysis for Research in Teaching (DART), an audio-based classroom activity tracker:

- <https://sepaldart.herokuapp.com>
- PNAS paper: <http://www.pnas.org/content/114/12/3085>
- News: <https://phys.org/news/2017-03-tool-classrooms.html>
- The tool can distinguish between
 - single voice,
 - multiple voices, and
 - no voice.

Why should we do this? Why now?

- Human classroom assessments are notoriously biased and difficult.
- Classroom assessments are becoming more important. E.g., our department needs to assess adjuncts and non-tenure track faculty now for promotion.
- Student feedback is not enough.
- There is potential for significant impact/usage in higher education.
- No such tool currently exists.
- We have a wide variety of relevant expertise in the lab.
- It's fun!

Modules that we may need

1. Audio processing
 - a. Distinguish different voices
 - b. Determine noise level
2. Video processing
 - a. Track instructor
 - b. Determine activity
3. Higher-level analysis and fusion of audio and video streams

Other thoughts and stuff

- A server-based solution where people can upload video files seems more appropriate as a start.
- An Android/iPhone app could be a longer-term goal.
- The system could perhaps be combined/integrated with real-time student feedback.
- Code: Python
- Repo: Github