Classroom Analytica: Progress Summary

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teuscher.:Lab
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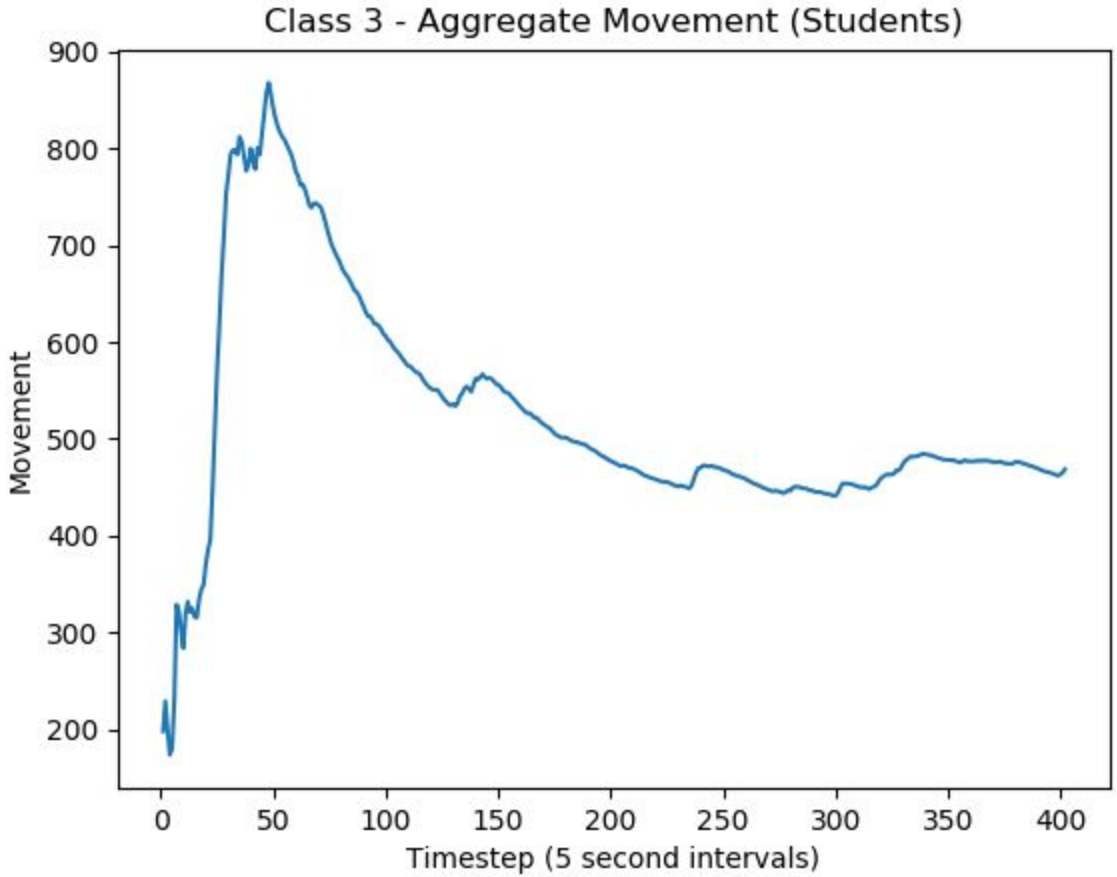
Brief Overview of Project

- Automate the analysis of classroom activity
- Use both video and audio
- Show proof of concept for various concepts:
  - Individual and aggregate movement, temporal activity categorization by video and audio, parallelization of slow steps

Labeling the Professor

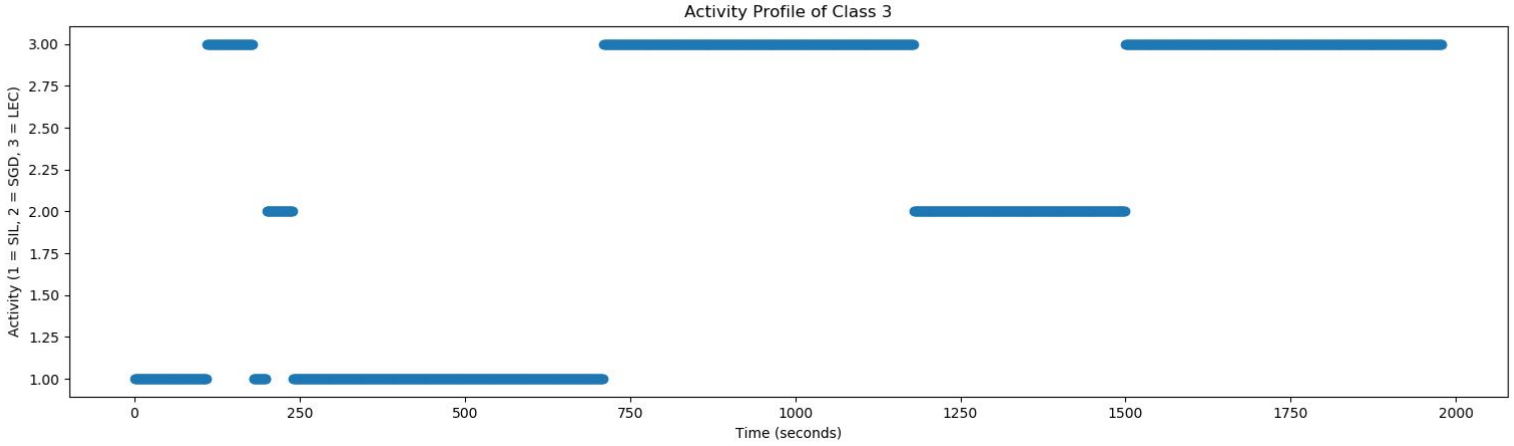
Individual Movement

Quantifying Aggregate Movement

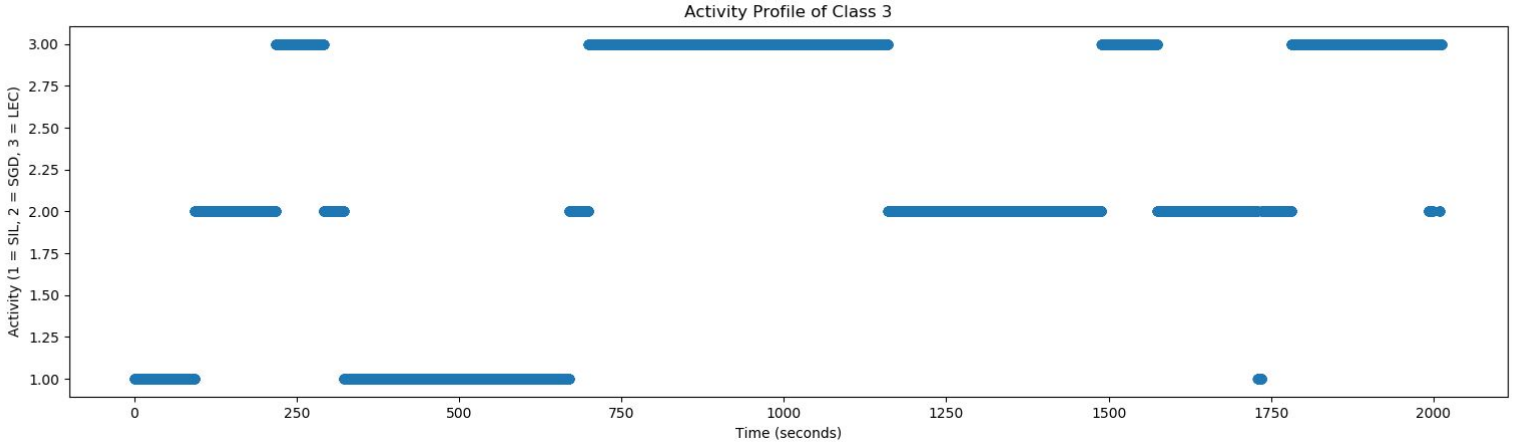

Class 3 - Aggregate Movement (Students)
Movement
900
800
700
600
500
400
300
200
0
50
100
150
200
250
300
350
400
Timestep (5 second intervals)

Activity Categorization by Video

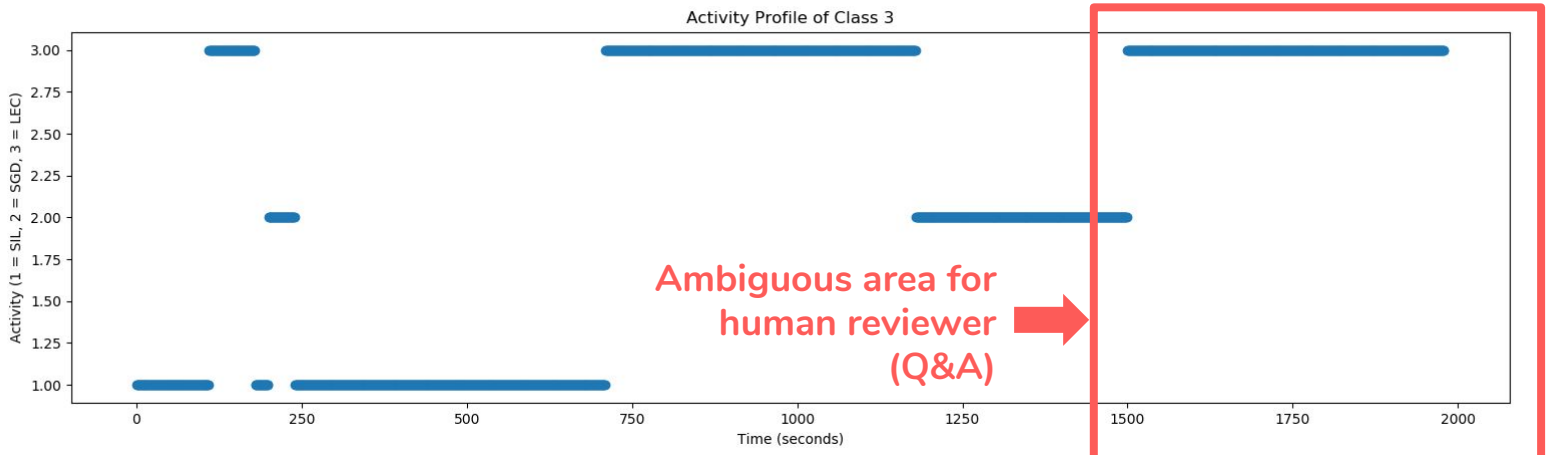
HUMAN



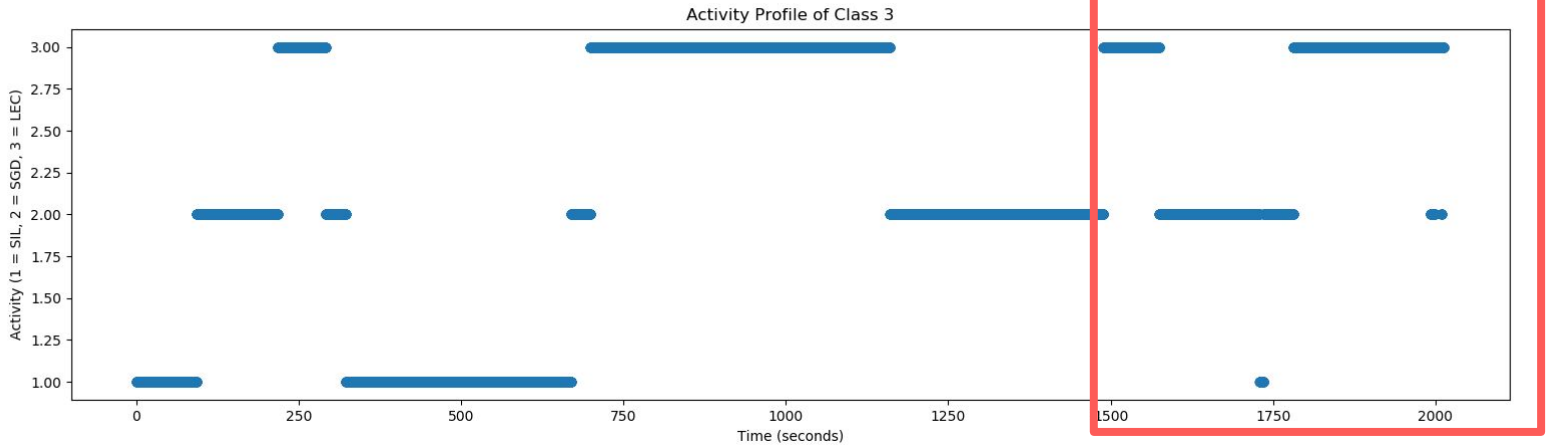
COMPUTER

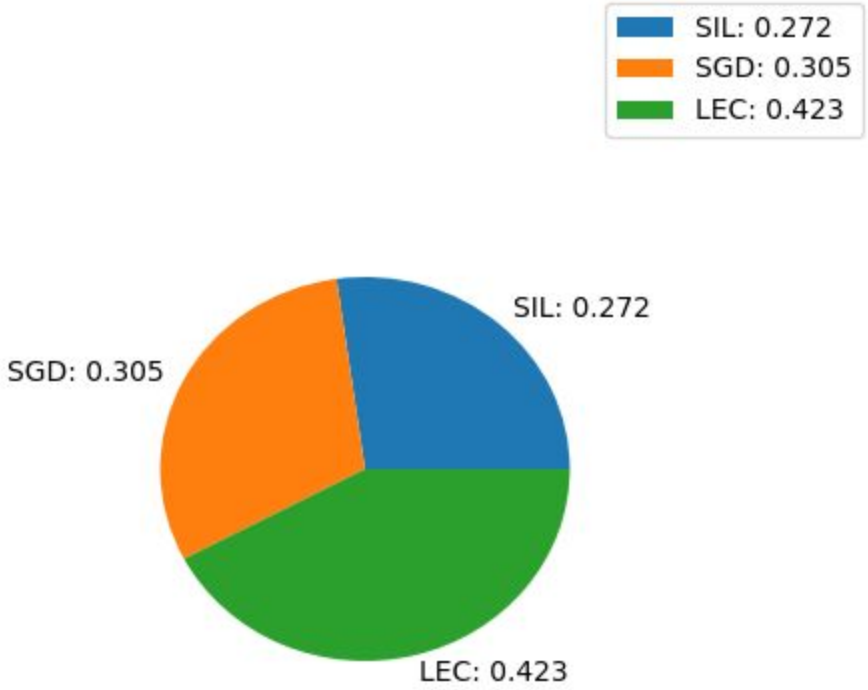


HUMAN

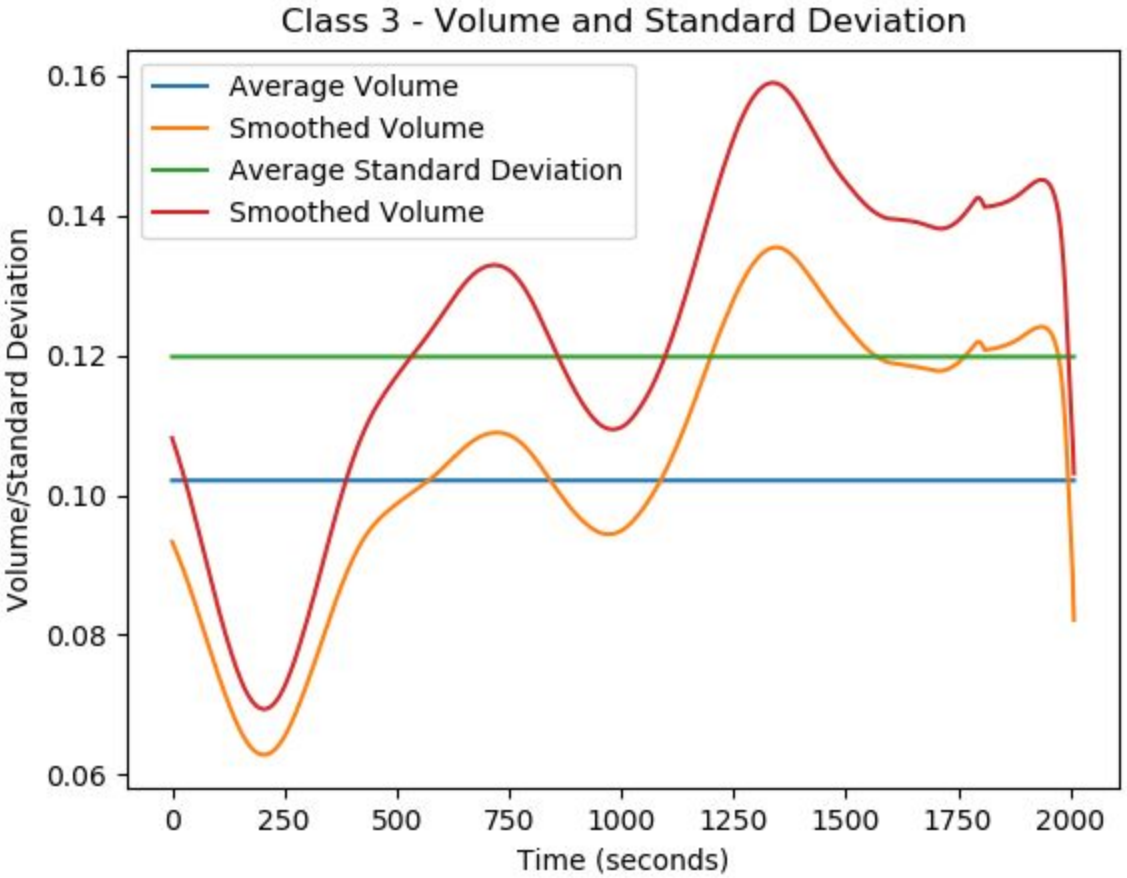


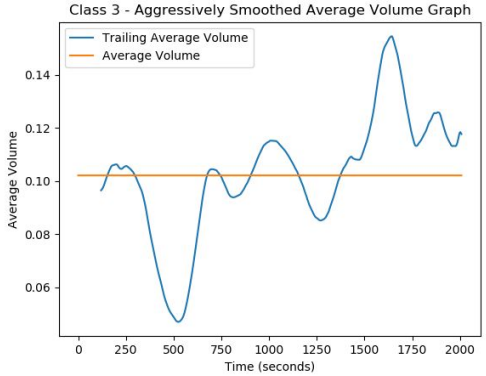
COMPUTER

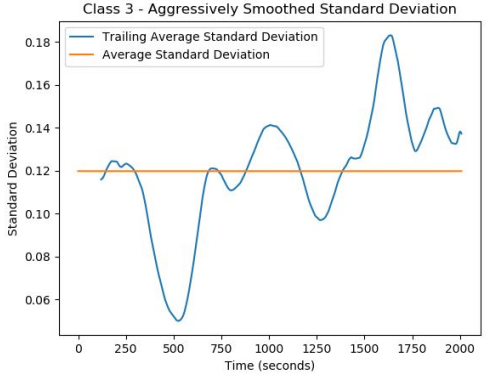


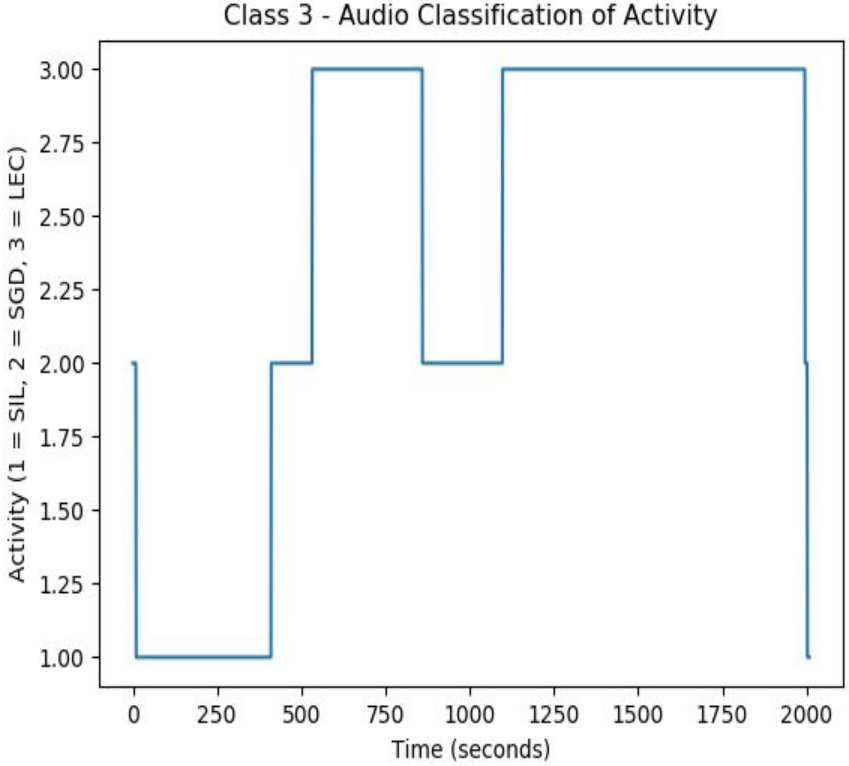

SIL: 0.272
SGD: 0.305
LEC: 0.423
SIL: 0.272
SGD: 0.305
LEC: 0.423

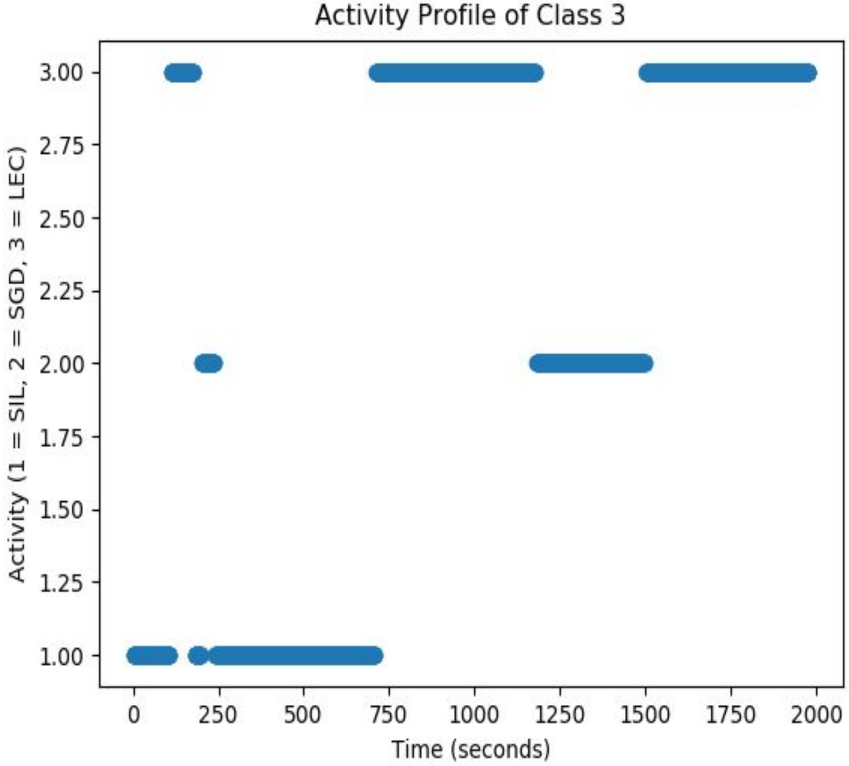
Analyzing Audio Data

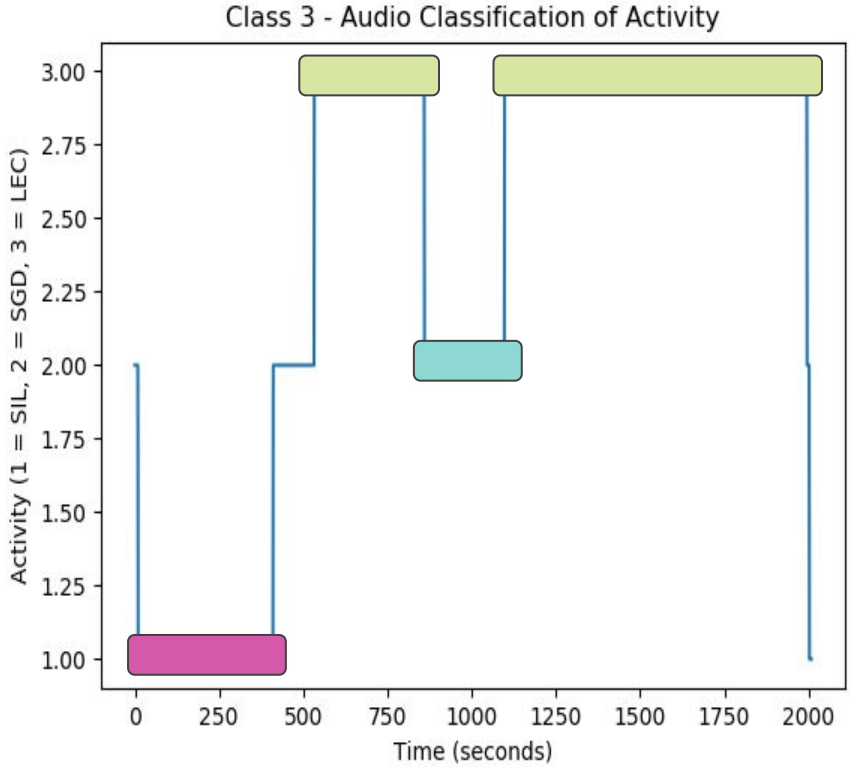

Class 3 - Volume and Standard Deviation
Average Volume
Smoothed Volume
Average Standard Deviation
Smoothed Volume
Volume/Standard Deviation
0.16
0.14
0.12
0.10
0.08
0.06
0
250
500
750
1000
1250
1500
1750
2000
Time (seconds)


Class 3 - Aggressively Smoothed Average Volume Graph
Trailing Average Volume
Average Volume
Average Volume
0.14
0.12
0.10
0.08
0.06
0
250
500
750
1000
1250
1500
1750
2000
Time (seconds)

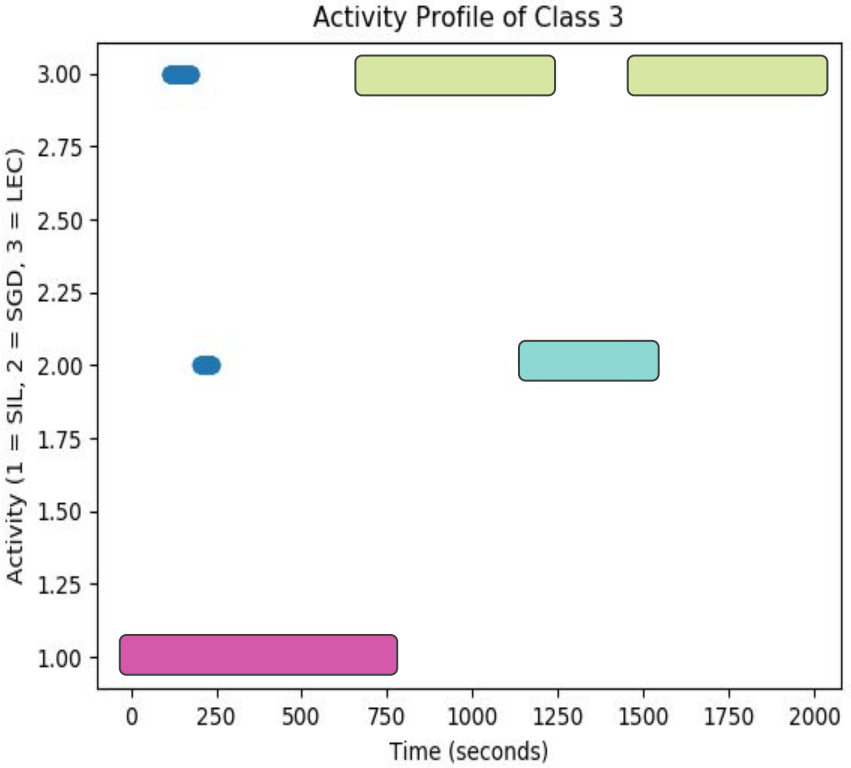

Class 3 - Aggressively Smoothed Standard Deviation
Trailing Average Standard Deviation
Average Standard Deviation
Standard Deviation
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0
250
500
750
1000
1250
1500
1750
2000
Time (seconds)


Class 3 - Audio Classification of Activity
Activity (1 = SIL, 2 = SGD, 3 = LEC)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0
250
500
750
1000
1250
1500
1750
2000
Time (seconds)


Activity Profile of Class 3
Activity (1 = SIL, 2 = SGD, 3 = LEC)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0
250
500
750
1000
1250
1500
1750
2000
Time (seconds)



Machine-generated



Human-generated

Parallelization

End of Parallelized Face Recognition

[...]

doing some stuff on frame 60394

doing some stuff on frame 60395

doing some stuff on frame 60393

doing some stuff on frame 60392

0_pilatus 330% user time (1% mpi), 96% user cpu, 15709685 messages (0% user)

C 330% user time, 319% user cpu, quality 3.20 cpus, ran 20646.176s