

Detection of Bruxism Using Data From an In-Mouth Accelerometer

Author: Floris van der voorn
fvandervoorn@student.tudelft.nl
supervisor: Vivian Dsouza and Przemysław Pawełczak



Why?

- Bruxism is grinding and clenching of the teeth
- Effects 8 -12% of the population.
- Can cause multiple medical issues.
- Caused by genetics and stress.
- To find out the capabilities of the Densor.

Research question:

Can a Densor be used to detect bruxism events?



Densor[1]

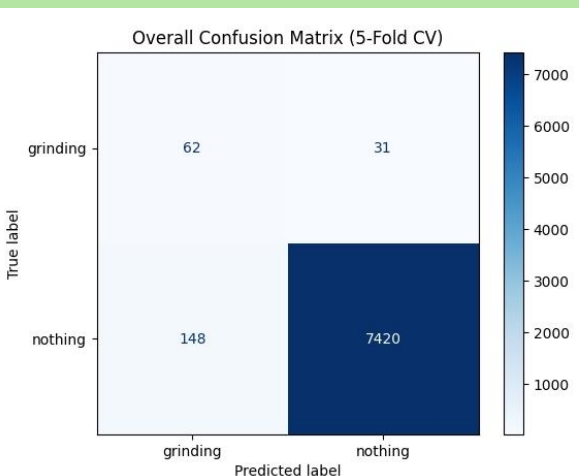
Conclusion

- Inconclusive
- High amount of false positives
- Class imbalance
- Artificial data

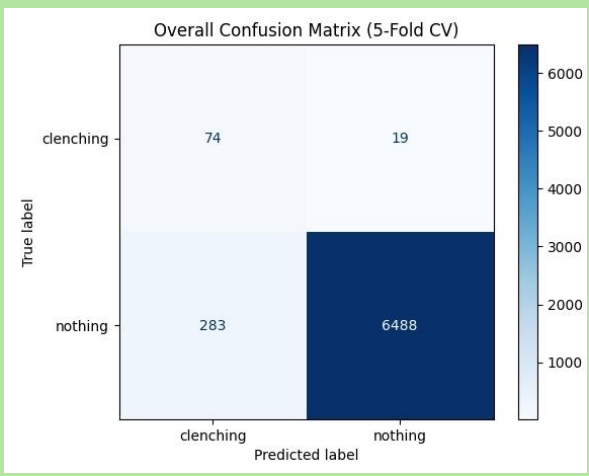
Known diagnostic methods

- Self reporting or reporting by partners/family members.
- Polysomnography (PSG)
- Electromyography (EMG)
- Wearable gyroscope in ear [2]

Results



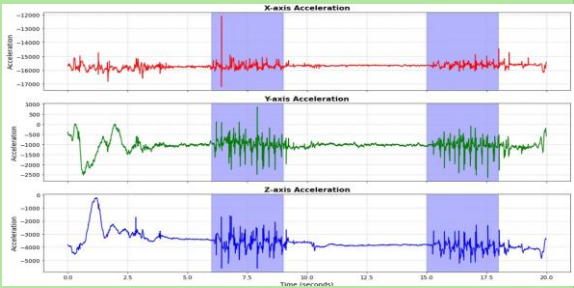
=== Overall Classification Report (5-Fold CV) ===				
	precision	recall	f1-score	support
nothing	1.00	0.98	0.99	7568
grinding	0.30	0.67	0.41	93
accuracy			0.98	7661
macro avg	0.65	0.82	0.70	7661
weighted avg	0.99	0.98	0.98	7661



=== Overall Classification Report (5-Fold CV) ===				
	precision	recall	f1-score	support
nothing	1.00	0.96	0.98	6771
clenching	0.21	0.80	0.33	93
accuracy			0.96	6864
macro avg	0.60	0.88	0.65	6864
weighted avg	0.99	0.96	0.97	6864

Methods

1. Accelerometer Data
 - Purpose made with a timer
 - Transformed into windows
2. Machine learning
 - Random Forest
 - Hidden Markov models
3. Feature extraction and Selection
4. Evaluation



future work

- More balanced data set
- Real overnight data
- More advanced models