

Supplementary Materials for the paper:

# A deep learning epileptic seizure detection based on matching pursuit algorithm and its time-frequency graphical representation

by

Mateusz M. KUNIK & Artur GRAMACKI

## 1 Sample spectrograms

Two sample spectrograms are shown below, one in high resolution and the other at  $64 \times 64$  pixels. The spectrograms were created using the exact same data used to generate the maps shown in Figure 2 of the article.

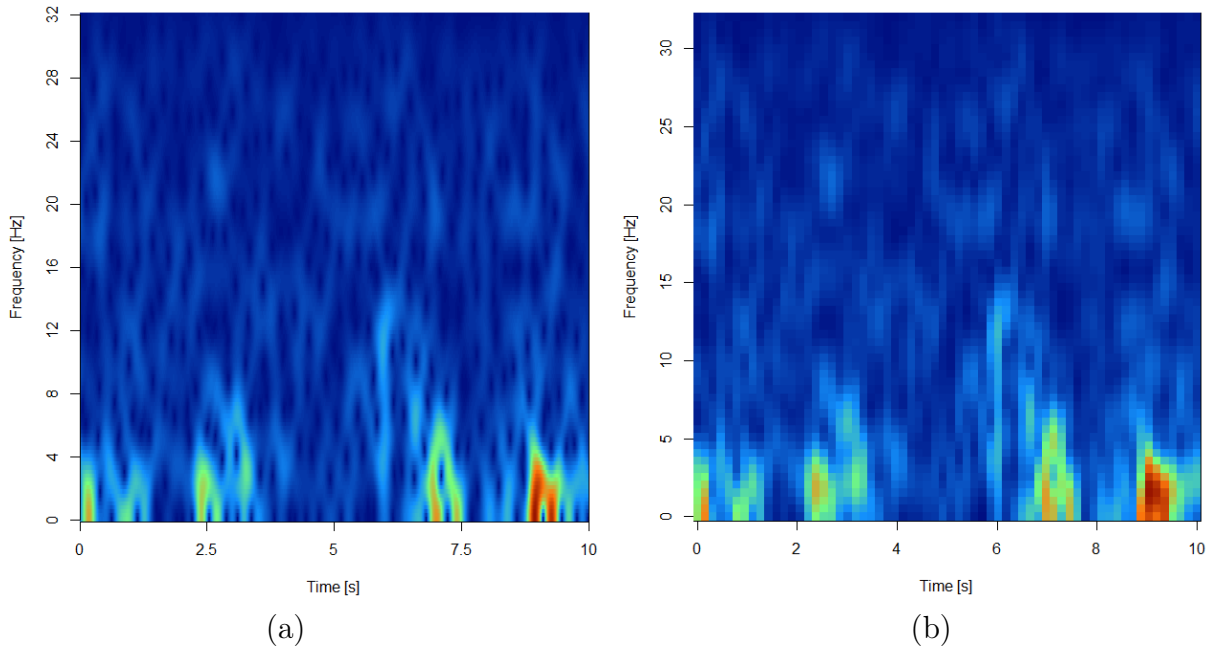


Figure 1: Spectrograms of an sample signal with high resolution (a), the same spectrogram but after limiting the resolution to the size of  $64 \times 64$  pixels (b). Note: the visible colors are for visualization only and have no significance in the analysis.

## 2 Performance results for spectrogram-based time-frequency maps

Model: IndExpA					Model: IndExpB				
Fold No.	Loss	Accuracy	Precision	Recall	Fold No.	Loss	Accuracy	Precision	Recall
1	0.2591	0.9153	0.9670	0.8896	1	0.3515	0.8883	0.9056	0.8697
2	0.2863	0.8746	0.9138	0.8612	2	0.3563	0.8682	0.9460	0.8612
3	0.2658	0.9007	0.9539	0.8486	3	0.3435	0.8682	0.9103	0.9008
4	0.3083	0.8909	0.9735	0.8107	4	0.3662	0.8596	0.9100	0.8017
5	0.2711	0.8811	0.9496	0.8486	5	0.3567	0.8639	0.8707	0.9433
Mean	0.2781	0.8925	0.9516	0.8517	Mean	0.3548	0.8696	0.9085	0.8753
Std	0.0196	0.0161	0.0232	0.0284	Std	0.0083	0.0110	0.0267	0.0523

Model: IndExpC					Model: MergExps				
Fold No.	Loss	Accuracy	Precision	Recall	Fold No.	Loss	Accuracy	Precision	Recall
1	0.2800	0.8929	0.9302	0.8707	1	0.1547	0.9491	0.9499	0.9541
2	0.2519	0.9000	0.9927	0.8592	2	0.1652	0.9446	0.9545	0.9450
3	0.2515	0.9101	0.9525	0.8879	3	0.1310	0.9545	0.9801	0.9501
4	0.2280	0.9159	0.9367	0.9310	4	0.1530	0.9471	0.9617	0.9439
5	0.3022	0.8986	0.9558	0.8937	5	0.1447	0.9441	0.9735	0.9378
Mean	0.2627	0.9035	0.9536	0.8885	Mean	0.1497	0.9479	0.9639	0.9462
Std	0.0287	0.0093	0.0243	0.0274	Std	0.0128	0.0042	0.0127	0.0062

Table 1: Performance metrics obtained for models trained on time-frequency maps obtained by transforming the EEG signals using the spectrogram algorithm, for datasets labeled by individual experts and on the merged multi-expert dataset. For each model, results for all five folds of the cross-validation procedure are reported, along with the mean and standard deviation across the folds.

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