Supplementary materials to:

Canonical EEG Microstates Transitions Reflect Switching Among BOLD Resting State Networks and Predict fMRI Signal.

Obada Al Zoubi\textsuperscript{1,2,3}, Ahmad Mayeli\textsuperscript{1}, Masaya Misaki\textsuperscript{1#}, Aki Tsuchiyagaito\textsuperscript{1,4}, Vadim Zotev\textsuperscript{1},

Tulsa 1000 Investigators\textsuperscript{1,3,5*}, Hazem Refai\textsuperscript{2}, Martin Paulus\textsuperscript{1}, Jerzy Bodurka\textsuperscript{*,1,6#}

\textsuperscript{1}Laureate Institute for Brain Research, Tulsa, OK, United States
\textsuperscript{2}Electrical and Computer Engineering, University of Oklahoma, Tulsa, OK, United States
\textsuperscript{3}Harvard Medical School, Boston, USA
\textsuperscript{4}Japan Society for the Promotion of Science, Tokyo, Japan
\textsuperscript{5}Department of Community Medicine, Oxley Health Sciences, University of Tulsa, Tulsa, Oklahoma, United States
\textsuperscript{6}Stephenson School of Biomedical Engineering, University of Oklahoma, Norman, OK, United States

\textsuperscript{*}Corresponding author
\textsuperscript{#}Deceased
Grid-search optimization of mTDNN architecture

![Figure S1: mTDNN architecture optimization results](image)

Figure S1: mTDNN architecture optimization results. Four experiments were tested including A) predicting MS dynamics from the BOLD signal; (B) predicting MS timecourses from the BOLD signal; (C) predicting BOLD signal from the microstates dynamics; and (D) predicting BOLD signal from MS timecourses. For each experiment, we averaged the Pearson’s correlation among true and predicted outputs. The red asterisk indicates the best performance. It should be noted that the analysis was conducted for the first 30 TRs of the signal.
Time series cross-validation for predicting BOLD and MS properties

\textbf{Figure S2}: Time series cross-validation procedure.
EEG-ms Direct Time Courses Correlated Maps for 2-20 Hz filtering – thresholded

**Figure S3**: Significant clusters for MS-A, MS-C, and MS-D using direct time course regressors. Clustering was performed at p<0.005 and corrected at p<0.05.

EEG-ms Direct Time Courses Correlated Maps for 1-40 Hz filtering

**Figure S4**: The un-thresholded maps of each the EEG-ms direct time regressors. No significant clusters were found for MS-A and MS-B.
Figure S5: Significant clusters for MS-C and MS-D using direct time course regressors. Clustering was performed at p<0.005 and corrected at p<0.05.

EEG-ms Activity per microstate Correlated Maps for 1-40 Hz filtering

Figure S6: Significant clusters for MS-A, MS-B, MS-C, and MS-D using activity regressors. Clustering was performed at p<0.005 and corrected at p<0.05.
EEG-ms pair-wise transition per microstate Correlated Maps for 1-40 Hz filtering

**Figure S7**: Significant clusters for transitions out of MS-A to other MSs. Clustering was performed at p<0.005 and corrected at p<0.05.

**Figure S8**: Significant clusters for transitions out of MS-B to other MSs. p<0.005 and corrected at p<0.05.
Figure S9: Significant clusters for transitions out of MS-C to other MSs. Clustering was performed at p<0.005 and corrected at p<0.05.

Figure S10: Significant clusters for transitions out of MS-D to other MSs. Clustering was performed at p<0.005 and corrected at p<0.05.