Readme document for Multi-Sensor EEG (MSEEG) MATLAB Package V1.0 [1]

The additional material in this file is provided by Mohammad Al-Sa'd and Prof. Boualem Boashash to assist the reader to better understand the supplementary material of the paper in [1]. The MSEEG MATLAB package can be obtained using the permanent GitHub link in [2].

Dependencies:

The MSEEG toolbox requires adding the Multi-sensor Time–Frequency Signal Processing (MTFSP) and Time–Frequency Signal Analysis and Processing (TFSAP) toolboxes in the "Toolbox" folder provided within its directory. The former toolboxes are detailed in [3] and [4] and can be downloaded from [5] and [6] respectively. Furthermore, some scripts of the MSEEG toolbox require the original multi-sensor newborn EEG database to run correctly. The original database is protected under the law and cannot be provided publicly. Nevertheless, it can be made available subject to an agreed collaborative arrangement with Prof Boashash.

MATLAB Scripts:

The MATLAB demo, main and supplementary scripts listed below are used to produce results, data and supporting figures for the paper in [1]. They can be treated as examples on how to use the developed MSEEG toolbox.

Demo_1_database_details.m

- Description: This script produces the main results that are depicted in Table 1 on page 5 of the paper.
- Process: It computes and presents details of the utilized newborn EEG database.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Demo_2_analysis_of_real_EEG.m

- Description: This script produces the main results that are depicted in Figures 1-4 on pages 5-6 of the paper.
- Process: It computes and plots time-space and time-frequency (TF) representations of real newborn background and seizure EEG epochs.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Demo_3_power_maps_real_EEG.m

- Description: This script produces the main results that are depicted in Figure 5 on page 7 of the paper.
- Process: It plots the power map of patient-1 multi-sensor EEG.

Demo_4_correlation_real_EEG.m

- Description: This script produces the main results that are depicted in Figure 6 on page 7 of the paper.
- Process: It plots averaged multi-sensor TF correlation matrices of all patients' real background and seizure EEG.

Demo_5_synchrony_real_EEG.m

- Description: This script produces the main results that are depicted in Figure 7 on page 8 of the paper.

- Process: It plots averaged multi-sensor TF synchrony matrices of all patients' real background and seizure EEG.

Demo_6_simualted_mono_EEG.m

- Description: This script produces the main results that are depicted in Figures 8 and 9 on pages 8-9 of the paper.
- Process: It plots time, frequency and TF representations of simulated mono-sensor background and seizure EEG epochs.

Demo_7_four_sphere.m

- Description: This script produces the main results that are depicted in Figures 10 and 11 on page 10 of the paper.
- Process: It plots the developed four sphere head model along with 21 EEG electrodes attached to the surface of the scalp sphere.

Demo_8_power_phase_dispersion.m

- Description: This script produces the main results that are depicted in Figures 13 and 14 on page 12 of the paper.
- Process: It computes and plots EEG power and phase distributions for different number of source signals.

Demo_9_simualted_multi_EEG.m

- Description: This script produces the main results that are depicted in Figure 15 on page 14 of the paper.
- Process: It generates and plots synthetic multi-sensor EEG comprised of both seizure and background epochs to demonstrate the intermediary stages required when producing a complete multi-sensor EEG.

Demo_10_intensity_optimisation_results.m

- Description: This script produces the main results that are depicted in Table 3 on page 15 of the paper.
- Process: It presents the computed optimal initial intensities for the multi-sensor EEG propagation model for each patient in the database. Moreover, it computes the model performance when mimicking real newborn EEG.

Demo_11_sources_optimisation_results.m

- Description: This script produces the main results that are depicted in Table 4 and Figure 16 on page 16 of the paper.
- Process: It presents the computed optimal number of source signals for the multi-sensor EEG propagation model for each patient in the database. Furthermore, it computes the model performance when mimicking real newborn EEG. In addition, it depicts the optimal source locations of patient-1 data for demonstration.

Demo_12_speed_optimisation.m

- Description: This script produces the main results that are depicted in Table 5 on page 16 of the paper.
- Process: It presents the computed optimal propagation speeds for the multi-sensor EEG propagation model for each patient in the database. In addition, it computes the model performance when mimicking real newborn EEG.

Demo_13_pdf_estimation.m

- Description: This script produces the main results that are depicted in Figure 17 on page 17 of the paper.
- Process: It plots the estimated probability density functions (PDF) of real newborn seizure and background EEG, simulated clean seizure and background EEG, and lastly, simulated noisy seizure and background EEG. In addition, it presents the parameters of each estimated PDF.

Demo_14_noise_level_optimisation.m

- Description: This script produces the main results that are depicted in Figure 18 on page 18 of the paper.
- Process: It plots the estimated PDFs of optimal noise levels for simulated seizure and background EEG. In addition, it presents the parameters of each estimated PDF.

Demo_15_analysis_of_simulated_EEG.m

- Description: This script produces the main results that are depicted in Figure 19 on page 18 of the paper.
- Process: It plots patient-3 real and simulated multi-sensor EEG waveforms for comparison.

Demo_16_power_maps_simulated_EEG.m

- Description: This script produces the main results that are depicted in Figure 20 on page 19 of the paper.
- Process: It plots the power map of patient-3 real and simulated multi-sensor EEG for comparison.

Demo_17_correlation_simulated_EEG.m

- Description: This script produces the main results that are depicted in Figure 21 on page 20 of the paper.
- Process: It plots averaged multi-sensor TF correlation matrices of all patients' simulated background and seizure EEG.

Demo_18_synchrony_simulated_EEG.m

- Description: This script produces the main results that are depicted in Figure 22 on page 20 of the paper.
- Process: It plots averaged multi-sensor TF synchrony matrices of all patients' simulated background and seizure EEG.

Supp_1_analysis_of_real_EEG.m

- Description: This script produces the supplementary results that are depicted in Figures B.1 (a) - B.6 (a) on pages 22-25 of the paper.
- Process: It plots real multi-sensor EEG signals of each patient in the database.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Supp_2_analysis_of_simulated_EEG.m

- Description: This script produces the supplementary results that are depicted in Figures B.1 (b) - B.6 (b) on pages 22-25 of the paper.
- Process: It plots simulated multi-sensor EEG signals of each patient in the database.

Supp_3_power_maps_real_EEG.m

- Description: This script produces the supplementary results that are depicted in Figures B.7 (a) - B.12 (a) on pages 25-26 of the paper.

- Process: It plots power map of real multi-sensor EEG signals for each patient in the database.

Supp_4_power_maps_simulated_EEG.m

- Description: This script produces the supplementary results that are depicted in Figures B.7 (b) - B.12 (b) on pages 25-26 of the paper.
- Process: It plots power map of simulated multi-sensor EEG signals for each patient in the database.

Supp_5_correlation_real_EEG.m

- Description: This script produces the supplementary results that are depicted in Table B.1 on page 26 of the paper.
- Process: It presents and details multi-sensor TF correlation analysis of each patients' real background and seizure EEG.

Supp_6_synchrony_real_EEG.m

- Description: This script produces the supplementary results that are depicted in Table B.2 on page 26 of the paper.
- Process: It presents and details multi-sensor TF synchrony analysis of each patients' real background and seizure EEG.

Supp_7_correlation_simulated_EEG.m

- Description: This script produces the supplementary results that are depicted in Table B.3 on page 26 of the paper.
- Process: It presents and details multi-sensor TF correlation analysis of each patients' simulated background and seizure EEG.

Supp_8_synchrony_simulated_EEG.m

- Description: This script produces the supplementary results that are depicted in Table B.4 on page 27 of the paper.
- Process: It presents and details multi-sensor TF synchrony analysis of each patients' simulated background and seizure EEG.

Supp_9_source_positions.m

- Description: This script produces the supplementary results that are depicted in Figures B.13-B.18 on pages 27-28 of the paper.
- Process: It plots optimal source signals locations for each patient background and seizure epochs in three dimensional Cartesian coordinates.

Main_1_power_maps_real_EEG.m

- Description: This script produces the data located in "*Data\Power Maps*" within the toolbox directory.
- Process: It computes the power map of real EEG for each patient in the database.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Main_2_correlation_real_EEG.m

- Description: This script produces some of the data located in "*Data\Correlation*" within the toolbox directory.
- Process: It computes TF correlation of real background and seizure epochs for each patient in the database.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Main_3_synchrony_real_EEG.m

- Description: This script produces some of the data located in "*Data\ Synchrony*" within the toolbox directory.
- Process: It computes TF synchrony of real background and seizure epochs for each patient in the database.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Main_4_intensity_optimisation_seizure.m

- Description: This script produces some of the data located in "*Data\Optimisation\Intensity*" within the toolbox directory.
- Process: It computes performance metrics of different initial intensities when mimicking seizure epochs of each patient.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Main_5_intensity_optimisation_background.m

- Description: This script produces some of the data located in "*Data\Optimisation\Intensity*" within the toolbox directory.
- Process: It computes performance metrics of different initial intensities when mimicking background epochs of each patient.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Main_6_sources_computations.m

- Description: This script produces the data located in "*Data\Optimisation\Sources\Population 30*", "*Data\Optimisation\Sources\Population 50*", "*Data\Optimisation\Sources\Population 75*", "*Data\Optimisation\Sources\Population 100*", "*Data\Optimisation\Sources\Population 150*" and "*Data\Optimisation\Sources\Population 200*" within the toolbox directory.
- Process: It calculates optimal locations of background and seizure source signals for different Particle Swarm Optimization (PSO) parameters and number of sources.

Main_7_sources_optimisation.m

- Description: This script produces the data located in "*Data\Optimisation\Positions*" and "*Data\Optimisation\Positions\Optimal Positions*" within the toolbox directory.
- Process: It finds optimal number of source signals along with their locations for background and seizure epochs of each patient in the database.

Main_8_speed_optimisation.m

- Description: This script produces some of the data located in "*Data\Optimisation\Speed*" within the toolbox directory.
- Process: It computes performance metrics of different propagation speeds when mimicking real EEG through Monte-Carlo simulations.

Main_9_system_variability.m

- Description: This script produces some of the data located in "*Data\Optimisation\Speed*" within the toolbox directory.
- Process: It computes performance metrics when utilizing optimal propagation speeds for different synthetic EEG waveforms to assess the system variability.

Main_10_computing_clean_simulated_results.m

- Description: This script produces some of the data located in "*Data\Simulated EEG*" within the toolbox directory.
- Process: It produces optimal simulated clean multi-sensor EEG waveforms using the parameters computed by previous scripts for each patient in the database.
- Note: It requires the original multi-sensor newborn EEG database to run correctly.

Main_11_noise_estimation.m

- Description: This script produces some of the data located in "*Data\Optimisation\Noise*" within the toolbox directory.
- Process: It estimates the PDF of multi-sensor EEG noise using Maximum-Likelihood Estimation (MLE).

Main_12_optimising_noise_level.m

- Description: This script produces some of the data located in "*Data\Optimisation\Noise*" within the toolbox directory.
- Process: It computes optimal noise levels to simulate noisy EEG.

Main_13_computing_noisy_simulated_results.m

- Description: This script produces some of the data located in "*Data\Simulated EEG*" within the toolbox directory.
- Process: It produces optimal simulated noisy multi-sensor EEG waveforms using the noise levels and PDFs estimated by previous scripts for each patient in the database.

Main_14_pdf_estimation.m

- Description: This script produces some of the data located in "*Data\Optimisation\Noise*" within the toolbox directory.
- Process: It estimates the PDFs of clean and noisy simulated multi-sensor EEG for each patient in the database using MLE.

Main_15_correlation_simulated_EEG.m

- Description: This script produces some of the data located in "*Data\Correlation*" within the toolbox directory.
- Process: It computes TF correlation of simulated background and seizure epochs for each patient in the database.

Main_16_synchrony_simulated_EEG.m

- Description: This script produces some of the data located in "*Data\Synchrony*" within the toolbox directory.
- Process: It computes TF synchrony of simulated background and seizure epochs for each patient in the database.

Toolbox Functions:

The developed MSEEG toolbox is comprised of the following MATLAB functions that are located in specific folders within "Toolbox" directory:

10-20 System

- *electrode_10_20.m*: It is used to place EEG electrodes on the four-sphere head model according to the 10-20 International standard.

Graphics

- *draw_ellipse.m*: It is used to generate graphical ellipses.
- *plot_multichannel.m*: It is used to plot multi-channel or multi-sensor data.
- *rotateXLabels.m*: It is used to rotate the x-axis labels of MATLAB figures. This function is downloaded from Mathworks official website.
- *tight_subplot.m*: It is used to plot multiple MATLAB figures with customized margins. This function is downloaded from Mathworks official website.

Head Model

- *baby.m*: It is used to normalize baby head polygons according to a specific head radius.
- *cone_model.m*: It is used to generate the nose for the four-sphere head model to determine the front and back views.
- *ellipsoid_model.m*: It is used to generate the ears for the four-sphere head model to determine the side views.
- *sphere_cross.m*: It is used to generate the complete spheres or cross-sections of the heal model.

IF-Based Model

- *EEG_back.m*: It is used to generate mono-sensor newborn simulated background EEG.
- *EEG_seiz.m*: It is used to generate mono-sensor newborn simulated seizure EEG.
- *FDsig.m*: It is used to generate fractal signals that are utilized by the *EEG_back.m* function.

Optimisation

- *Cost_Fun.m*: It is used to compute PSO cost function.
- *multi_prop_opt.m*: It is used to estimate power maps that are utilized by the *Cost_Fun.m* function.
- *power_div.m*: It is used to compute noise levels.
- *power_fun.m*: It is used to add multi-sensor noise with specific power level.
- *PSO.m*: It is our Particle Swarm Optimization implementation.

Propagation Model

- *event_pos.m*: It is used to generate random locations for EEG source signals within the brain sphere.
- *line_sphere.m*: It is used to compute mono-sensor attenuation and translation factors using the line-and-sphere intersection method.
- *multi_sensor_EEG.m*: It is the main function for the developed toolbox, and it is used to generate multi-sensor newborn EEG comprised of seizure and background epochs.
- *multi_sensor_propagation.m*: It is used to compute multi-sensor attenuation and translation matrices for the propagation of EEG source signals.
- *power_phase_dist.m*: It is used to compute the power and phase distributions of EEG source signals.

Toolbox Datasets:

The developed MSEEG toolbox contains the following datasets within its directory:

Data\3D

- *brain.mat*: It contains a realistic newborn brain atlas.
- *head.mat*: It contains a realistic newborn head atlas.

Data\Correlation

- *Patient_1_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-1 real EEG.

- *Patient_2_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-2 real EEG.
- *Patient_3_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-3 real EEG.
- *Patient_4_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-4 real EEG.
- *Patient_5_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-5 real EEG.
- *Patient_6_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-6 real EEG.
- *Patient_7_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-7 real EEG.
- *simulated_EEG_1_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-1 simulated EEG.
- *simulated_EEG_2_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-2 simulated EEG.
- *simulated_EEG_3_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-3 simulated EEG.
- *simulated_EEG_4_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-4 simulated EEG.
- *simulated_EEG_5_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-5 simulated EEG.
- *simulated_EEG_6_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-6 simulated EEG.
- *simulated_EEG_7_corr.mat*: It contains time and TF correlations for the background and seizure epochs of patient-7 simulated EEG.

Data\EEG

- *Channels.mat*: It contains channel labels of the acquired EEG database.
- *Ratios.mat*: It contains ratios of seizure and background EEG segments with respect to their total for each patient in the database.

Data\Optimisation\Intensity

- *Optimal_Intensities.mat*: It contains optimal initial intensities for each patient in the database when mimicking seizure and background epochs.
- *Patient_1_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-1 background EEG.
- *Patient_2_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-2 background EEG.
- *Patient_3_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-3 background EEG.
- *Patient_4_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-4 background EEG.
- *Patient_5_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-5 background EEG.
- *Patient_6_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-6 background EEG.
- *Patient_7_background.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-7 background EEG.

- *Patient_1_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-1 seizure EEG.
- *Patient_2_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-2 seizure EEG.
- *Patient_3_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-3 seizure EEG.
- *Patient_4_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-4 seizure EEG.
- *Patient_5_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-5 seizure EEG.
- *Patient_6_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-6 seizure EEG.
- *Patient_7_seizure.mat*: It contains performance metrics for 100 different initial intensities when mimicking patient-7 seizure EEG.

Data\Optimisation\Noise

- *Clean_PDF.mat*: It contains MLE results when estimating the PDF of clean EEG.
- *Noisy_PDF.mat*: It contains MLE results when estimating the PDF of noisy EEG.
- *Noise_Estimation.mat*: It contains MLE results when estimating the PDF of EEG noise.
- *Noise_Level.mat*: It contains optimal noise levels for background and seizure epochs.
- *Noise_Level_distribution.mat*: It contains MLE results when estimating the PDF of noise levels.

Data\Optimisation\Positions

Source_Optimisation_Background.mat: It contains performance metrics for the best results coming from different PSO populations when optimizing the number of background source signals.
Source_Optimisation_Seizure.mat: It contains performance metrics for the best results coming from different PSO populations when optimizing the number of seizure source signals.

Data\Optimisation\Positions\Optimal Positions

Patient_1.mat: It contains optimal locations of seizure and background source signals when mimicking patient-1 EEG.
Patient_2.mat: It contains optimal locations of seizure and background source signals when mimicking patient-2 EEG.
Patient_3.mat: It contains optimal locations of seizure and background source signals when mimicking patient-3 EEG.
Patient_4.mat: It contains optimal locations of seizure and background source signals when mimicking patient-4 EEG.
Patient_5.mat: It contains optimal locations of seizure and background source signals when mimicking patient-5 EEG.
Patient_6.mat: It contains optimal locations of seizure and background source signals when mimicking patient-6 EEG.
Patient_7.mat: It contains optimal locations of seizure and background source signals when mimicking patient-7 EEG.

Data\Optimisation\Sources\Population 30

- *Patient_1_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of patient-1 EEG using 30 PSO populations.
- *Patient_1_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of patient-1 EEG using 30 PSO populations.
- *Patient_1_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of patient-1 EEG using 30 PSO populations.

- *Patient_1_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of patient-1 EEG using 30 PSO populations.
- *Patient_1_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of patient-1 EEG using 30 PSO populations.
- *Patient_1_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of patient-1 EEG using 30 PSO populations.
- *Patient_2_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-2 EEG using 30 PSO populations.
- *Patient_2_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-2 EEG using 30 PSO populations.
- *Patient_2_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-2 EEG using 30 PSO populations.
- *Patient_2_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-2 EEG using 30 PSO populations.
- *Patient_2_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-2 EEG using 30 PSO populations.
- *Patient_2_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-2 EEG using 30 PSO populations.
- *Patient_3_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-3 EEG using 30 PSO populations.
- *Patient_3_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-3 EEG using 30 PSO populations.
- *Patient_3_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-3 EEG using 30 PSO populations.
- *Patient_3_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-3 EEG using 30 PSO populations.
- *Patient_3_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-3 EEG using 30 PSO populations.
- *Patient_3_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-3 EEG using 30 PSO populations.
- *Patient_4_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-4 EEG using 30 PSO populations.
- *Patient_4_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-4 EEG using 30 PSO populations.
- *Patient_4_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-4 EEG using 30 PSO populations.
- *Patient_4_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-4 EEG using 30 PSO populations.
- *Patient_4_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-4 EEG using 30 PSO populations.
- *Patient_4_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-4 EEG using 30 PSO populations.
- *Patient_5_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-5 EEG using 30 PSO populations.
- *Patient_5_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-5 EEG using 30 PSO populations.
- *Patient_5_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-5 EEG using 30 PSO populations.

- *Patient_5_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-5 EEG using 30 PSO populations.
- *Patient_5_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-5 EEG using 30 PSO populations.
- *Patient_5_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-5 EEG using 30 PSO populations.
- *Patient_6_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-6 EEG using 30 PSO populations.
- *Patient_6_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-6 EEG using 30 PSO populations.
- *Patient_6_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-6 EEG using 30 PSO populations.
- *Patient_6_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-6 EEG using 30 PSO populations.
- *Patient_6_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-6 EEG using 30 PSO populations.
- *Patient_6_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-6 EEG using 30 PSO populations.
- *Patient_7_Pop_30_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-7 EEG using 30 PSO populations.
- *Patient_7_Pop_30_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-7 EEG using 30 PSO populations.
- *Patient_7_Pop_30_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-7 EEG using 30 PSO populations.
- *Patient_7_Pop_30_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-7 EEG using 30 PSO populations.
- *Patient_7_Pop_30_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-7 EEG using 30 PSO populations.
- *Patient_7_Pop_30_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-7 EEG using 30 PSO populations.

Data\Optimisation\Sources\Population 50

- *Patient_1_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of patient-1 EEG using 50 PSO populations.
- *Patient_1_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of patient-1 EEG using 50 PSO populations.
- *Patient_1_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of patient-1 EEG using 50 PSO populations.
- *Patient_1_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of patient-1 EEG using 50 PSO populations.
- *Patient_1_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of patient-1 EEG using 50 PSO populations.
- *Patient_1_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of patient-1 EEG using 50 PSO populations.
- *Patient_2_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-2 EEG using 50 PSO populations.
- *Patient_2_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-2 EEG using 50 PSO populations.

- *Patient_2_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-2 EEG using 50 PSO populations.
- *Patient_2_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-2 EEG using 50 PSO populations.
- *Patient_2_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-2 EEG using 50 PSO populations.
- *Patient_2_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-2 EEG using 50 PSO populations.
- *Patient_3_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-3 EEG using 50 PSO populations.
- *Patient_3_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-3 EEG using 50 PSO populations.
- *Patient_3_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-3 EEG using 50 PSO populations.
- *Patient_3_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-3 EEG using 50 PSO populations.
- *Patient_3_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-3 EEG using 50 PSO populations.
- *Patient_3_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-3 EEG using 50 PSO populations.
- *Patient_4_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-4 EEG using 50 PSO populations.
- *Patient_4_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-4 EEG using 50 PSO populations.
- *Patient_4_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-4 EEG using 50 PSO populations.
- *Patient_4_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-4 EEG using 50 PSO populations.
- *Patient_4_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-4 EEG using 50 PSO populations.
- *Patient_4_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-4 EEG using 50 PSO populations.
- *Patient_5_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-5 EEG using 50 PSO populations.
- *Patient_5_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-5 EEG using 50 PSO populations.
- *Patient_5_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-5 EEG using 50 PSO populations.
- *Patient_5_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-5 EEG using 50 PSO populations.
- *Patient_5_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-5 EEG using 50 PSO populations.
- *Patient_5_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-5 EEG using 50 PSO populations.
- *Patient_6_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-6 EEG using 50 PSO populations.
- *Patient_6_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-6 EEG using 50 PSO populations.

- *Patient_6_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-6 EEG using 50 PSO populations.
- *Patient_6_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-6 EEG using 50 PSO populations.
- *Patient_6_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-6 EEG using 50 PSO populations.
- *Patient_6_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-6 EEG using 50 PSO populations.
- *Patient_7_Pop_50_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-7 EEG using 50 PSO populations.
- *Patient_7_Pop_50_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-7 EEG using 50 PSO populations.
- *Patient_7_Pop_50_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-7 EEG using 50 PSO populations.
- *Patient_7_Pop_50_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-7 EEG using 50 PSO populations.
- *Patient_7_Pop_50_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-7 EEG using 50 PSO populations.
- *Patient_7_Pop_50_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-7 EEG using 50 PSO populations.

Data\Optimisation\Sources\Population 75

- *Patient_1_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of patient-1 EEG using 75 PSO populations.
- *Patient_1_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of patient-1 EEG using 75 PSO populations.
- *Patient_1_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of patient-1 EEG using 75 PSO populations.
- *Patient_1_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of patient-1 EEG using 75 PSO populations.
- *Patient_1_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of patient-1 EEG using 75 PSO populations.
- *Patient_1_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of patient-1 EEG using 75 PSO populations.
- *Patient_2_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-2 EEG using 75 PSO populations.
- *Patient_2_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-2 EEG using 75 PSO populations.
- *Patient_2_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-2 EEG using 75 PSO populations.
- *Patient_2_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-2 EEG using 75 PSO populations.
- *Patient_2_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-2 EEG using 75 PSO populations.
- *Patient_2_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-2 EEG using 75 PSO populations.
- *Patient_3_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-3 EEG using 75 PSO populations.

- *Patient_3_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-3 EEG using 75 PSO populations.
- *Patient_3_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-3 EEG using 75 PSO populations.
- *Patient_3_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-3 EEG using 75 PSO populations.
- *Patient_3_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-3 EEG using 75 PSO populations.
- *Patient_3_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-3 EEG using 75 PSO populations.
- *Patient_4_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-4 EEG using 75 PSO populations.
- *Patient_4_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-4 EEG using 75 PSO populations.
- *Patient_4_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-4 EEG using 75 PSO populations.
- *Patient_4_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-4 EEG using 75 PSO populations.
- *Patient_4_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-4 EEG using 75 PSO populations.
- *Patient_4_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-4 EEG using 75 PSO populations.
- *Patient_5_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-5 EEG using 75 PSO populations.
- *Patient_5_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-5 EEG using 75 PSO populations.
- *Patient_5_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-5 EEG using 75 PSO populations.
- *Patient_5_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-5 EEG using 75 PSO populations.
- *Patient_5_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-5 EEG using 75 PSO populations.
- *Patient_5_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-5 EEG using 75 PSO populations.
- *Patient_6_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-6 EEG using 75 PSO populations.
- *Patient_6_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-6 EEG using 75 PSO populations.
- *Patient_6_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-6 EEG using 75 PSO populations.
- *Patient_6_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-6 EEG using 75 PSO populations.
- *Patient_6_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-6 EEG using 75 PSO populations.
- *Patient_6_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-6 EEG using 75 PSO populations.
- *Patient_7_Pop_75_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-7 EEG using 75 PSO populations.

- *Patient_7_Pop_75_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-7 EEG using 75 PSO populations.
- *Patient_7_Pop_75_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-7 EEG using 75 PSO populations.
- *Patient_7_Pop_75_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-7 EEG using 75 PSO populations.
- *Patient_7_Pop_75_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-7 EEG using 75 PSO populations.
- *Patient_7_Pop_75_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-7 EEG using 75 PSO populations.

Data\Optimisation\Sources\Population 100

- *Patient_1_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of patient-1 EEG using 100 PSO populations.
- *Patient_1_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of patient-1 EEG using 100 PSO populations.
- *Patient_1_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of patient-1 EEG using 100 PSO populations.
- *Patient_1_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of patient-1 EEG using 100 PSO populations.
- *Patient_1_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of patient-1 EEG using 100 PSO populations.
- *Patient_1_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of patient-1 EEG using 100 PSO populations.
- *Patient_2_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-2 EEG using 100 PSO populations.
- *Patient_2_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-2 EEG using 100 PSO populations.
- *Patient_2_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-2 EEG using 100 PSO populations.
- *Patient_2_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-2 EEG using 100 PSO populations.
- *Patient_2_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-2 EEG using 100 PSO populations.
- *Patient_2_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-2 EEG using 100 PSO populations.
- *Patient_3_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-3 EEG using 100 PSO populations.
- *Patient_3_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-3 EEG using 100 PSO populations.
- *Patient_3_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-3 EEG using 100 PSO populations.
- *Patient_3_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-3 EEG using 100 PSO populations.
- *Patient_3_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-3 EEG using 100 PSO populations.
- *Patient_3_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-3 EEG using 100 PSO populations.

- *Patient_4_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-4 EEG using 100 PSO populations.
- *Patient_4_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-4 EEG using 100 PSO populations.
- *Patient_4_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-4 EEG using 100 PSO populations.
- *Patient_4_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-4 EEG using 100 PSO populations.
- *Patient_4_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-4 EEG using 100 PSO populations.
- *Patient_4_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-4 EEG using 100 PSO populations.
- *Patient_5_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-5 EEG using 100 PSO populations.
- *Patient_5_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-5 EEG using 100 PSO populations.
- *Patient_5_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-5 EEG using 100 PSO populations.
- *Patient_5_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-5 EEG using 100 PSO populations.
- *Patient_5_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-5 EEG using 100 PSO populations.
- *Patient_5_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-5 EEG using 100 PSO populations.
- *Patient_6_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-6 EEG using 100 PSO populations.
- *Patient_6_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-6 EEG using 100 PSO populations.
- *Patient_6_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-6 EEG using 100 PSO populations.
- *Patient_6_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-6 EEG using 100 PSO populations.
- *Patient_6_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-6 EEG using 100 PSO populations.
- *Patient_6_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-6 EEG using 100 PSO populations.
- *Patient_7_Pop_100_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-7 EEG using 100 PSO populations.
- *Patient_7_Pop_100_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-7 EEG using 100 PSO populations.
- *Patient_7_Pop_100_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-7 EEG using 100 PSO populations.
- *Patient_7_Pop_100_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-7 EEG using 100 PSO populations.
- *Patient_7_Pop_100_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-7 EEG using 100 PSO populations.
- *Patient_7_Pop_100_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-7 EEG using 100 PSO populations.

Data\Optimisation\Sources\Population 150

- *Patient_1_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of patient-1 EEG using 150 PSO populations.
- *Patient_1_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of patient-1 EEG using 150 PSO populations.
- *Patient_1_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of patient-1 EEG using 150 PSO populations.
- *Patient_1_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of patient-1 EEG using 150 PSO populations.
- *Patient_1_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of patient-1 EEG using 150 PSO populations.
- *Patient_1_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of patient-1 EEG using 150 PSO populations.
- *Patient_2_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-2 EEG using 150 PSO populations.
- *Patient_2_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-2 EEG using 150 PSO populations.
- *Patient_2_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-2 EEG using 150 PSO populations.
- *Patient_2_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-2 EEG using 150 PSO populations.
- *Patient_2_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-2 EEG using 150 PSO populations.
- *Patient_2_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-2 EEG using 150 PSO populations.
- *Patient_3_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-3 EEG using 150 PSO populations.
- *Patient_3_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-3 EEG using 150 PSO populations.
- *Patient_3_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-3 EEG using 150 PSO populations.
- *Patient_3_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-3 EEG using 150 PSO populations.
- *Patient_3_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-3 EEG using 150 PSO populations.
- *Patient_3_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-3 EEG using 150 PSO populations.
- *Patient_4_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-4 EEG using 150 PSO populations.
- *Patient_4_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-4 EEG using 150 PSO populations.
- *Patient_4_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-4 EEG using 150 PSO populations.
- *Patient_4_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-4 EEG using 150 PSO populations.
- *Patient_4_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-4 EEG using 150 PSO populations.
- *Patient_4_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-4 EEG using 150 PSO populations.

- *Patient_5_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-5 EEG using 150 PSO populations.
- *Patient_5_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-5 EEG using 150 PSO populations.
- *Patient_5_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-5 EEG using 150 PSO populations.
- *Patient_5_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-5 EEG using 150 PSO populations.
- *Patient_5_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-5 EEG using 150 PSO populations.
- *Patient_5_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-5 EEG using 150 PSO populations.
- *Patient_6_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-6 EEG using 150 PSO populations.
- *Patient_6_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-6 EEG using 150 PSO populations.
- *Patient_6_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-6 EEG using 150 PSO populations.
- *Patient_6_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-6 EEG using 150 PSO populations.
- *Patient_6_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-6 EEG using 150 PSO populations.
- *Patient_6_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-6 EEG using 150 PSO populations.
- *Patient_7_Pop_150_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-7 EEG using 150 PSO populations.
- *Patient_7_Pop_150_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-7 EEG using 150 PSO populations.
- *Patient_7_Pop_150_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-7 EEG using 150 PSO populations.
- *Patient_7_Pop_150_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-7 EEG using 150 PSO populations.
- *Patient_7_Pop_150_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-7 EEG using 150 PSO populations.
- *Patient_7_Pop_150_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-7 EEG using 150 PSO populations.

Data\Optimisation\Sources\Population 200

- *Patient_1_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of patient-1 EEG using 200 PSO populations.
- *Patient_1_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of patient-1 EEG using 200 PSO populations.
- *Patient_1_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of patient-1 EEG using 200 PSO populations.
- *Patient_1_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of patient-1 EEG using 200 PSO populations.
- *Patient_1_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of patient-1 EEG using 200 PSO populations.

- *Patient_1_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of patient-1 EEG using 200 PSO populations.
- *Patient_2_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-2 EEG using 200 PSO populations.
- *Patient_2_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-2 EEG using 200 PSO populations.
- *Patient_2_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-2 EEG using 200 PSO populations.
- *Patient_2_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-2 EEG using 200 PSO populations.
- *Patient_2_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-2 EEG using 200 PSO populations.
- *Patient_2_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-2 EEG using 200 PSO populations.
- *Patient_3_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-3 EEG using 200 PSO populations.
- *Patient_3_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-3 EEG using 200 PSO populations.
- *Patient_3_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-3 EEG using 200 PSO populations.
- *Patient_3_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-3 EEG using 200 PSO populations.
- *Patient_3_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-3 EEG using 200 PSO populations.
- *Patient_3_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-3 EEG using 200 PSO populations.
- *Patient_4_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-4 EEG using 200 PSO populations.
- *Patient_4_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-4 EEG using 200 PSO populations.
- *Patient_4_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-4 EEG using 200 PSO populations.
- *Patient_4_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-4 EEG using 200 PSO populations.
- *Patient_4_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-4 EEG using 200 PSO populations.
- *Patient_4_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-4 EEG using 200 PSO populations.
- *Patient_5_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-5 EEG using 200 PSO populations.
- *Patient_5_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-5 EEG using 200 PSO populations.
- *Patient_5_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-5 EEG using 200 PSO populations.
- *Patient_5_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-5 EEG using 200 PSO populations.
- *Patient_5_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-5 EEG using 200 PSO populations.

- *Patient_5_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-5 EEG using 200 PSO populations.
- *Patient_6_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-6 EEG using 200 PSO populations.
- *Patient_6_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-6 EEG using 200 PSO populations.
- *Patient_6_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-6 EEG using 200 PSO populations.
- *Patient_6_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-6 EEG using 200 PSO populations.
- *Patient_6_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-6 EEG using 200 PSO populations.
- *Patient_6_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-6 EEG using 200 PSO populations.
- *Patient_7_Pop_200_n1.mat*: It contains optimal location of 1 source signal for each seizure and background epochs of Patient-7 EEG using 200 PSO populations.
- *Patient_7_Pop_200_n2.mat*: It contains optimal locations of 2 source signals for each seizure and background epochs of Patient-7 EEG using 200 PSO populations.
- *Patient_7_Pop_200_n3.mat*: It contains optimal locations of 3 source signals for each seizure and background epochs of Patient-7 EEG using 200 PSO populations.
- *Patient_7_Pop_200_n4.mat*: It contains optimal locations of 4 source signals for each seizure and background epochs of Patient-7 EEG using 200 PSO populations.
- *Patient_7_Pop_200_n5.mat*: It contains optimal locations of 5 source signals for each seizure and background epochs of Patient-7 EEG using 200 PSO populations.
- *Patient_7_Pop_200_n6.mat*: It contains optimal locations of 6 source signals for each seizure and background epochs of Patient-7 EEG using 200 PSO populations.

Data\Optimisation\Speed

- *Optimal_Speeds.mat*: It contains optimal propagation speeds for each patient EEG in the database.
- *Patient_1.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-1 EEG.
- *Patient_2.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-2 EEG.
- *Patient_3.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-3 EEG.
- *Patient_4.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-4 EEG.
- *Patient_5.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-5 EEG.
- *Patient_6.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-6 EEG.
- *Patient_7.mat*: It contains performance metrics for 100 different propagations speeds when simulating patient-7 EEG.

Data\Power Maps

- *Patient_1_power.mat*: It contains computed power map for patient-1 EEG.
- *Patient_2_power.mat*: It contains computed power map for patient-2 EEG.
- *Patient_3_power.mat*: It contains computed power map for patient-3 EEG.
- *Patient_4_power.mat*: It contains computed power map for patient-4 EEG.

- *Patient_5_power.mat*: It contains computed power map for patient-5 EEG.
- *Patient_6_power.mat*: It contains computed power map for patient-6 EEG.
- *Patient_7_power.mat*: It contains computed power map for patient-7 EEG.

Data\Simulated EEG

- *Patient_1.mat*: It contains optimal simulated multi-sensor EEG for patient-1.
- *Patient_2.mat*: It contains optimal simulated multi-sensor EEG for patient-2.
- *Patient_3.mat*: It contains optimal simulated multi-sensor EEG for patient-3.
- *Patient_4.mat*: It contains optimal simulated multi-sensor EEG for patient-4.
- *Patient_5.mat*: It contains optimal simulated multi-sensor EEG for patient-5.
- *Patient_6.mat*: It contains optimal simulated multi-sensor EEG for patient-6.
- *Patient_7.mat*: It contains optimal simulated multi-sensor EEG for patient-7.

Data\Synchrony

- *Patient_1_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-1 real EEG.
- *Patient_2_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-2 real EEG.
- *Patient_3_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-3 real EEG.
- *Patient_4_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-4 real EEG.
- *Patient_5_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-5 real EEG.
- *Patient_6_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-6 real EEG.
- *Patient_7_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-7 real EEG.
- *simulated_EEG_1_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-1 simulated EEG.
- *simulated_EEG_2_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-2 simulated EEG.
- *simulated_EEG_3_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-3 simulated EEG.
- *simulated_EEG_4_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-4 simulated EEG.
- *simulated_EEG_5_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-5 simulated EEG.
- *simulated_EEG_6_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-6 simulated EEG.
- *simulated_EEG_7_synch.mat*: It contains TF synchrony values for the background and seizure epochs of patient-7 simulated EEG.

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