Title of the competition: Dementia screening challenge

Organisers: Hokuto Hospital, Kumagaya General Hospital, and RICOH Company, Ltd., JAPAN.

Data providers: Hokuto Hospital, Kumagaya General Hospital, and Mihara Memorial Hospital, JAPAN.

5 March 2020

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Contact:

Yoshihito Shigihara MD PhD

meaw.system@gmail.com

1) Competition Description:

Dementia is a chronic and progressive syndrome caused by brain diseases with a few effective pharmacological treatments. It is important to diagnose it at the early stage of the syndrome, to provide effective interventions and slow the progression of the disease. Number of published studies have showed that magnetoencephalography (MEG) is sensitive to the subtle changes of brain activity related to dementia. MEG is a patient-friendly clinical examination tool, because it is totally non-invasive and the preparation/scanning time is short.

In this competition, your goal is to classify each of the MEG data sets ("test data", N = 42) into one of three classes: healthy volunteer, mild cognitive impartment (MCI), and dementia. For coding your classification algorithms, another set of MEG data ("training data") recorded from healthy volunteers (N = 100), patients with MCI (N = 15) and dementia (N = 29) are provided. All MEG data were recorded with the same paradigm (5-min resting-state recording with eyes-closed), but at two different sites (A or B, both sites have identical MEG systems). The sampling rate differed between sites: 1000Hz in site A, and 2000Hz in site B. All MEG data were recorded using 160-channel gradiometer system (Yokogawa at the site A and RICOH at the site B) and provided in SPM-12 format.

Beside the MEG data, age and gender information is available for all samples. If available, MMSE (Mini-Mental State Exam) score of the data-provider (healthy volunteer or patient) are also provided for the "training-data". All participants and patients gave written informed consent to re-use their data for advances in medicine. Submitted answers will be evaluated from the viewpoint of clinical medicine, and submitter(s) who provided the most reasonable classifications will be selected as the winner(s) of the competition.

2) How to Join

Please send an email request to [meaw.system@gmail.com](mailto:meaw.system@gmail.com), which is entitled ”BIOMAG DATA COMPETITION”. We will then send you back an URL for downloading the dataset and the password. After the completion of the task, please submit an answer sheet (Microsoft Excel format) and a set of materials (materials that are necessary for replicating your answers, e.g., analysis codes, algorithms) by email, which should be entitled ”SUBMISSION: BIOMAG DATA COMPETITION”. In the answer sheet, you are requested to provide “Estimated Classes” for each sample of the "test data". Optionally, you may also provide a confidence score (e.g., 100% very confident) for each of the diagnoses.

3) Prize and Duty of the Winner(s)

The winner(s) will share the monetary prize (5,000 pounds in total) (small prize-giving ceremony is planned during the Biomag2020 conference). The distribution of the prizes will be determined according to the number of the winner(s). The winner(s) obtains the copyright of the winning algorithms/codes, but the materials must be made freely available to the community (the organisers can help with this).

4) Deadline.

~~15st July 2020 (Greenwich Mean Time)~~

~~3rd May 2021 (Greenwich Mean Time): It was moved due to opponent of BIOMAG~~

Monday 2nd May 2022 (Greenwich Mean Time): It was moved due to opponent of BIOMAG

5) Limitation

You are not allowed to use/distribute the data for any purposes irrelevant to the competition, without organiser’s permission.