

IEEE Brain Initiative Competitions 2017 Brain Signal – Visualization & Analytics

Preliminary Call for Participation The Brain Data Bank (BDB) Competition at ICCE-Berlin - 2017







Registration Link: https://brain.ieee.org/news/brain-data-bank-competitions/

You are invited to participate in the Brain Data Bank competition by forming a team of up to 5 members. Your entry can be on-line or in person. Winners will be chosen only from teams that are present at the competition.

Contact:

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Purpose:

- To educate Brain Signal System Technology
- To assess usability of current brain signal databases
- To apply Big Data Analytics, Artificial Intelligence, Deep Learning techniques to the establishment of a user-centric brain signal data bank.
- To facilitate Brain Signal Data Standardization

Competition:

Figure 1 illustrates the data flow in brain signal data utilization. The IEEE Brain Initiative Competitions – 2017, will solicit creative means to investigate already collected brain data (circled in blue), following the success of BCI Hackathons1 – 2016, (dashed circle.)



Figure 1. Brain Signal Data Analytics Flow Source: N. Bigdelys-Shamlo, T. Mullen, C. Kothe, N. N. Chu, & K. A. Robbins, 2015

The participating team is expected to creatively demonstrate Brain Data Analytics based on one of several data sources:

- 1. Existing brain data from open sources, e.g.,
 - a. University of California San Francisco, NeuroRacer brain signal datasets, Nature, The International Weekly Journal of Science, doi:10.1038/nature12486, p. 97-101, continued with notes, p.1-28, 5 Sept., 2013. Datasets available on-line from IEEE Dataport. https://ieee-dataport.org/data-competitions
 - b. University of California San Diego, Swartz Center of Computational Neuroscience, *ftp://sccn.ucsd.edu/pub/arno_public_data*, *https://sccn.ucsd.edu/eeglab/download.php*
 - c. http://bnci-horizon-2020.eu/database/data-sets
- 2. Private (bring your own) brain signal data recorded from your own Brain Computer Interface. Some non-invasive devices, as shown in the photos below of the 2016 BCI Hackathons, will be made available during the competition for data collection.



The challenge is to create value and/or determine usability of brain signal data at hand. The participants will present their projects in terms of:

- 1. Creation and/or selection criteria of the brain signal datasets
- 2. Clarity and relevance of analysis
- 3. Methodology
- 4. Interpretation of brain signal data
- 5. Significance of findings and recommendations
- 6. Delivery of findings and recommendations

Location, Schedule and Participation:

ICCE-Berlin, September 3, 2017, http://www.icce-berlin.org/

Awards:

Cash prizes will be awarded to winners at the Brain Initiative Workshop Reception on November 2, 2017.

Agenda - preliminary (subject to change):

Pre-competition Webex will be arranged in early August to address questions from those who registered.

Sunday, 3 September, 2017

8:00 - 8:30 On-site Registration 8:30 - 9:00 Introduction and Team Positioning 9:00 - 11:00 Tutorials on brain signal database access 11:00 - 12:00 BCI headset loans for on-site data collection (Individual teams can bring their own equipment and own data as well) 12:00 - 18:00 Working 19:00 - 21:00 Team Presentation

Monday, 4 November, 2017 9:00 – 17:00 Selective Presentations in display at the ICCE-Berlin Conference

Tuesday, 5 September, 2017

17:00 – 18:00 Conference Banquet - BDB Competition Awards Presentation

References:

- J. A. Anguera, et. al., "Video Game Training Enhances Cognitive Control in Older Adults", "Game Changer", Nature, The International Weekly Journal of Science, doi:10.1038/nature12486, p. 97 - 101, notes followed on p.1-28, 5 Sept., 2013.
- N. N. Y. Chu, "Surprising Prevalence of Electroencephalogram Brain-Computer Interface to Internet of Things", CE Magazine, vol. 6, No. 2, April 2017.
- 3. Paul Sajda, "Integrating Brain-Computer Interface Technology With Augmented and Virtual Reality." ICCE Keynote, January 10, 2017. https:// www.youtube.com/watch?v=fn9eBJFvSuA
- 4. BHI 2017: Big Data Analytics Competition/ IEEE DataPort, https:// ieee-dataport.org/competitions/bhi-2017-big-data-analytics-competition
- 5. Brain Initiative Education Resources: http://brain.ieee.org/education/
- 6. BCI Hackathons 2016, http://brain.ieee.org/news/ieee-brain-initiativesponsor-3-hackathons-fall/
- Ariel Garten & Tim Mullen, "Brain Computer Interface: Present and Future." ICCE Keynotes, January, 2016. https://www.youtube.com/ watch?v=kD9d6dSy97g&index=6&list=PLcS-HUwSHpFqS0AsXnS-8JQF7hNFM08G4y
- Sheryl Flint, "Therapeutic Neurogame Application Development for Healthcare/Wellness." ICCE Tutorial, January, 2015. https://www.youtube.com/watch?v=T89GGTeDaac&index=11&list=PLcS-HUwSHp-FopISeGUTDb3CJ-_SfdnnR1