NeuroTechX Student Clubs Competition 2017

All team must submit a **10-min video** including a presentation and a demonstration of the project, for both challenges. All team must also provide a **public GitHub repository**, including the project components and a comprehensive description with all the steps to reproduce it. An example will soon be provided. The deadline for submitting a project to any of the two challenges is by the end of November, 2017. **All projects must be reproducible and open-source.**

Fixed challenge

The fixed challenge aims at increasing the general knowledge of neurotech students by challenging them to build a **fully home-made** acquisition **pipeline** for EEG signals, including the following five stages (stages 2 and 3 can be switched depending on stage 1), with variable constraints from year to year.

Each stage has specific objectives (italic items is required):

1. Acquisition
    a. *Develop an home-made acquisition board, with at least 1 channel*
    b. *Total cost of board must not exceed 1000 USD (excluding R&D)*
2. Signal processing
    a. *Focus on signal of interest (EEG) and remove artifacts and noise*
3. Data transmission
    a. *Data must be acquired with a speed of at least 200 Hz*
    b. Transmitted to a distant computer wirelessly or not
4. Real-time visualization
    a. *Real-time visualization of signal in the time and frequency domains, for each acquisition channel*
    b. An "alpha mode" must enable the easy characterization of the alpha band power, following a open/close paradigm
5. Data recording
    a. *Data must be stored on a computer with appropriate data format for latter use*

2017 constraints

- Acquisition of EEG signal is recommended (pipeline could be presented with EMG or ECG).
- Acquisition chips such as ADS1299 are accepted.
- PCB are highly recommended (not mandatory).
- Open-source libraries for data transmission and visualization are allowed, full package such as OpenVibe are not allowed.