NTX Student Club Competition 2023

1. Description

Each year, NeuroTechX organizes its renowned NTX Student Club Competition. During this annual event, numerous NTX Student Clubs from around the world submit their projects to a curated jury of industry leaders and experts for a chance to win monetary prizes, hardware and internships. Over the past several competitive seasons there has been an impressive uptick in the quality of projects submitted. This has prompted the NeuroTechX organization to evaluate what would be the best approach for upcoming seasons in an effort to accommodate this exciting ramp up.

With marked growth and expansion of Student Clubs and sponsors alike, NeuroTechX has revised our yearly structure for the competition to best suit the needs of all our Student Clubs across the globe. We will hold this year's competition on a timeline that results in the competition wrapping up in the summer, to facilitate the launch of our next Competition in Fall 2023. This way we can reset the next competition as a fast-following one in the Fall on a much longer timeline extending to Spring 2024. The goal for our competition is to set the foundation for coupling challenges with a more immersive review and project presentation.

This year we are aiming to include as many projects as possible, and to do so have decided to accept all projects from all Clubs no matter the phase of development! Student clubs will submit their project in a video format with their code and relevant files. Once projects are reviewed, winners will have their videos broadcast online live via a video streaming event (e.g. Twitch) where a public audience can tune in anytime, from anywhere, to watch.

NeuroTechX has experienced phenomenal growth recently with the onboarding of new student groups both across North America as well as the entire globe. Continuing to incorporate live streaming into this year's competition not only enhances participants' experiences but also aligns directly with the NTX mission: To facilitate the advancement of neurotechnology through three pillars: education, professional development and, particularly in the case of this year's competition, enriching our engaged and enthusiastic Student Clubs community who are ready to

learn, support one another and grow. This is an exciting challenge for NTX as organizers as much as it is for student club participators and industry partners.

2. Date & Timeline

The competition will take place from **April to Fall 2023**
Online project proposal deadline: **April 14th, 2023**
Project decision / approval deadline: **April 21st, 2023**
Project submissions due: **June 30th, 2023**
Winner selection and live-stream presentation: **Late Summer/ Early Fall 2023**

** If a student club is unable to submit a project for the 2023 competition, they may submit the same proposal to the 2024 competition.*

3. Format

All teams must submit a 10-min video that includes a presentation and demonstration of the project. All teams must provide a **public GitHub repository** that includes the project components as well as a comprehensive description with all the steps to reproduce it. **All projects must be reproducible and open-source.**

Participation rules

A team must be composed of at least three (3) **undergraduate students** from the same university (or campus). Make sure you can use your university name. A team must be part of an official NTX-affiliation student club with an available student club web page and administrators (point of contact).

Competition Challenge

The rules are fairly loose as we want to let the students explore, learn and be creative with the resources that they have. Some Clubs have access to different hardware and some might not even have access to any hardware and will be submitting a software project leveraging existing datasets. That is okay, too! An evaluation grid can be found at the end of this document so that everyone has access to a transparent and consistent judging process.

With the above in mind, students will have to *wow* the jury with their projects. The students will decide on the stack, the stimuli, the paradigm, the context, etc. As long as it incorporates the use of neurotechnology, the project qualifies!

An expert panel of reviewers will adjudicate the projects and their commentary will be provided to the competing Clubs afterward. NeuroTechX will also share the winners' projects to our community from around the world, through our marketing channels and a livestreamed awards ceremony that will take place at the end of the summer / early fall. Once a date is finalized it will be shared so that any / all audiences, team members, friends, family, jury and others can watch BCI innovation from the most aspirational and inspiring undergraduate minds from across the world.

4. Evaluation

The evaluation grid used by our jury for the 2023 competition is provided below. The full stack will be evaluated as well as the learning and the innovative components.

Category	Score	Elements	Subscore
Technical	**/60**		
		Technical description of the project *The description should be technical and detailed, should explain technological choices and should reflect your own understanding of the project and the underlying science.*	/15
		Innovation & complexity	/15
		User experience & Prototype *Does it work? Is it easy to use? Is it well designed? Price. etc.*	/15
		Pipeline *Acquisition, Signal Processing, Transmission, Real-Time Communication / Visualization, Data recording*	/15
Video	**/20**		
		Team presentation	/5
		Project presentation	/5
		Project demonstration	/5
		Lessons learned: what were the biggest challenges and how did you handle them?	/5
Reproducibility	**/15**		
		Requirements	/5
		Step by step to reproduce the project	/5
		Overall repo clarity & organization	/5
Limitations & Future	**/5**		
		What are the limitations of the project and what could be improved?	/5
TOTAL	**/100**		

Each evaluation aspect will be assessed by looking at the entire project.
(i.e., there should be no "ReadMe_Evaluation.doc" kind of document…)

5. Extra: Previous Winners

2021-2022:

- Fixed Challenge 1st place: WATOLINK, University of Waterloo: SSVEP BCI
- Fixed Challenge 2nd place: Triton NeuroTech, UC San Diego: Oz-Speller
- Fixed Challenge 3rd place: CruX, UCLA: P300 BCI

2020:

- Open Challenge 1st place: McGill NeuroTech, McGill University: EMGeyboard
- Open Challenge 2nd place: PolyCortex, Polytechnique Montreal: Polydodo
- Fixed Challenge 1st place: MINT, U. of British Columbia (UBC): JellyFish & MENTHA

You can see other 2020 projects here: bit.ly/NTXSC20

2019:

- Open Challenge 1st place: McGill NeuroTech, McGill University: Milo
- Open Challenge 2nd place: NeuroTechUofT, U. of Toronto: Neurostack + MindType
- Fixed Challenge 1st place: PolyCortex, Polytechnique Montreal: PolyCortex Acquisition

You can see other 2019 projects here: bit.ly/NTXSC19

#Throwback2016 - The first NTX SC Competition in Montreal
(with SC from McGill, Concordia, ETS, Polytechnique Montreal and U. of Toronto)