

The experiment between non-task and a motor task using finger- and foot- tapping

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Citation: It will be updated soon. Please contact admin.

Experimental paradigm

The experiment was composed of three separate sessions containing 25 trials of each task. A single trial was composed of an introduction period (2 s), a task period (10 s) followed by an inter-trial break (17-19 s). Note that triggers were sent and marked in the data file at the beginning of task periods. The inter-trial interval (i.e., the time interval between adjacent triggers) was 30 s on average. Participants were seated on a chair in front of a 27-inch LED monitor. All information and instructions regarding the experiment were displayed on the monitor. Among right-hand finger-tapping (RHT), left-hand finger-tapping (LHT), and foot-tapping (FT), a task type which participants have to perform was displayed at random. Participants continuously performed the assigned task during a task period, starting with a short beep. Then, an 'inter-trial break period' started with both a short beep and a 'STOP' sign on the monitor. Figure 1 describes the experimental paradigm. For RHT/LHT, participants performed unilateral complex finger tapping. Participants tapped their thumbs to other fingers one by one in the direction from index to the little finger and repeated it in reverse order. The tapping continued at a 2 Hz rate steadily. For FT, participants tapped their foot on the same side of their dominant hand at a 1 Hz rate constantly.

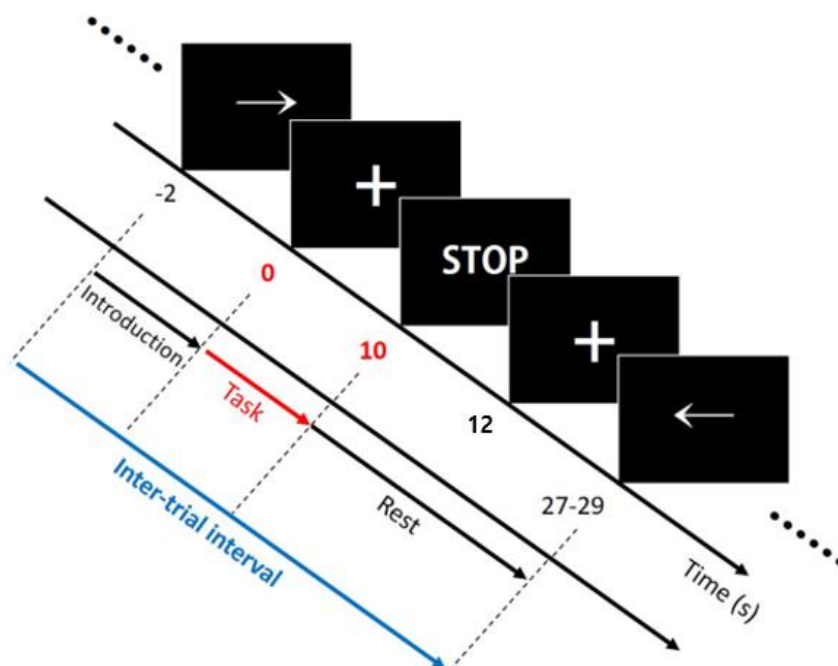


Figure 1. Experimental paradigm for the data acquisition.

Data recording

The fNIRS data were recorded by three-wavelength continuous-time multi-channel fNIRS system consisting of eight light sources (Tx) and eight detectors (Rx). Four each of Tx and Rx were placed around C3 on the left hemisphere, and the rest were around C4 on the right hemisphere. Figure 2 depicts the placement of fNIRS channel location. Ch01-10 and Ch11-20 are located around C3 (Ch09) and C4 (Ch18), respectively. The channels are created by a pair of adjacent Tx and Rx 30 mm away from each other.

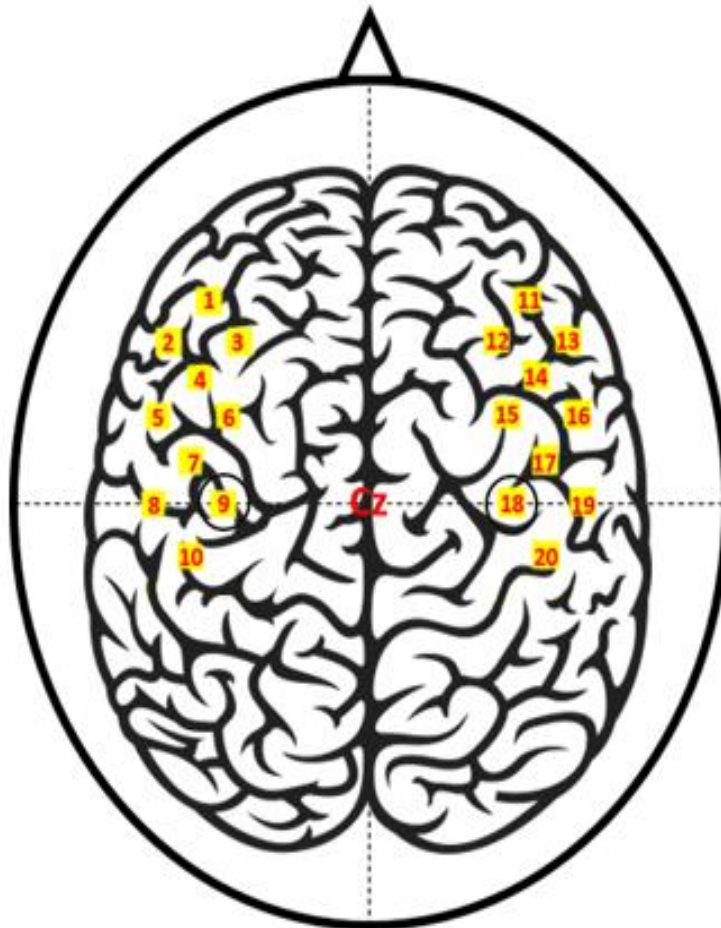


Figure 2. The electrodes placements used in our experiment

Data file description

The dataset of thirty participants were stored in MATLAB format. Each data of participants contain $\Delta\text{HbO}/\text{HbR}$ (cntHb), trigger (mrk), and fNIRS channel information (mnt). Each MATLAB structure array shown in Table 1.

Table 1. fNIRS dataset description

Structure	Field	Description
cntHb	.fs	Sampling rate (Hz)
	.clab	Channel labels
	.xUnit	x-axis unit
	.yUnit	y-axis unit
	.snr	Signal-to-noise ratio
mrk	.x	$\Delta\text{HbO}/\text{R}$
	.event.desc	Class labels' descriptions
	.time	Event occurrence times ¹
mnt	.y	Class labels in vector form
	.clab	Channel labels
	.box	Channel arrangement in Figures 3 and 4

¹A trigger is marked where each task period starts