

Workshop: EEG Acquisition

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Overview

This workshop provides hands-on experience with electroencephalography (EEG) equipment, electrode placement, artifact identification, and real-time signal control.

Students alternate roles between experimenter, participant, and observer to develop practical competency across different lab responsibilities.

Activity 1: Identify 10-20 system landmarks and electrode positions *on yourself*

Identify:

1. nasion (bridge of nose), inion (bump at back of skull), left and right preauricular points
2. mastoid process on both sides

Discuss how you could identify Cz

Activity 2: application of EEG sensors (with supervision)

1. Prepare the sites for mastoid electrodes
2. Apply the electrodes for the mastoid reference
3. Apply the EEG cap, ensuring correct alignment with midline landmarks

Activity 3: Recreate common artifacts and observe their morphology

Students work collaboratively to recreate and identify common sources of artifacts. For each artifact type, reflect on:

- **Morphology:** What characteristics does the artifact show in EEG recordings?
- **Regional influence:** Which electrodes show the artifact most prominently?

Type of artifact	Morphology	Location
Muscular activity		
Blinking		
Eye movements		
Electrode movement		
Environmental noise		

Activity 4: Self-regulation of cortical activity

Participants perform activities to *deliberately up-regulate and down-regulate* (neurofeedback) posterior EEG alpha activity while experimenters observe signal changes:

Reminder 1: alpha activity indicates cortical inhibition and is often associated with relaxed wakefulness

Reminder 2: posterior regions of the cerebral cortex are implicated in visual processing

Hint: Close your eyes and relax to *increase* alpha activity. Engage in a demanding cognitive task with eyes open to *decrease* alpha activity.

Optional entrainment activity

Homework reflection

1. Name two sources of artifacts one might see in an EEG recording.
2. Name the four landmarks used to position the electrodes in the international 10-20 system.
3. Based on its name, where on the head is the Fz electrode located?
4. Based on its name, where on the head is the P3 electrode located?
5. What is a way to increase alpha-rhythm activity in the posterior (parietal and occipital) regions?
6. What is a way to decrease alpha-rhythm activity in the posterior (parietal and occipital) regions?