

# MICRO: Human Bodily Micromotion in Music Perception and Interaction

Collecting data from music-related micromotion

## Subject areas

Humanities, Mathematics and Natural Science, Other, Social Science, Technology

## Research responsible institution

Universitetet i Oslo / Det humanistiske fakultet / Institutt for musikkvitenskap

## Project duration

01.08.2016 — 30.06.2021

## Purpose

The main is to understand more about the relationships between musical sound and human bodily micromotion in music perception. The secondary objectives are to: a) Define a set of sub-categories of music-related micromotion. b) Understand more about how musical sound influences the micromotion of perceivers, and which musical features (such as melody, harmony, rhythm, timbre, loudness, spatialisation) come into play. c) Develop conceptual models for controlling sound through micromotion, and develop prototypes of interactive music systems based on these models.

## Utility

Data from the project has been made available in Oslo Standstill Database. This database is relevant for other researchers interested in music-related body motion. It is also relevant for all researchers working on human micromotion, and particularly those interested in swaying. The data has already been used by computer scientists working on the optimization of machine learning techniques. There have also been inquiries by people working in the film industry, who are interested in using the data to make human-like animations.

## Funding

- Research Council of Norway (NFR) FRIPRO

## Ethical guidelines

- General guidelines for research ethics
- Science and Technology
- Social Sciences, Humanities, Law and Theology
- Declaration of Helsinki
- The Vancouver Recommendations

- Guidelines for research ethical and scientifically assessment of qualitative research projects

## Championship of Standstill data

### Description

This is the largest dataset and contains head-marker motion capture data from around 70-100 participants for each edition. The task was to stand as still as possible in groups of people (3-11) in a competitive setting. There were slight variations each year, with different types of music being played to the participants.

### Data type

Dataset, Sound, Other

### Language

English, Norwegian

### Keywords

motion capture, micromotion, music, sound, standstill, swaying

### Data about people

Yes

### Are there any other reasons why your data needs extra protection?

No

### Categories of personal data

Anonymous

### Sample size

500

### Security classification

Open

### Data collection period

01.01.2017 — 31.07.2019

### Collection devices

- Camera (photo and video), institution
- Sound recorder/dictaphone, institution
- Questionnaire - electronic
- Questionnaire - paper-based
- UiO Nettskjema

**Data quality**

The same procedure and questionnaires were used for all Championships of Standstill.

**Method**

Observation, Recording, Other, Experiment, Measurements and tests

**Description**

Each participant wore a reflective marker on his/her head, and its position was recorded using a Qualisys infrared motion capture system (Oqus 300) running at 100 Hz. Data was recorded and preprocessed in the Qualisys Track Manager, and the analysis was done in Matlab using the MoCap Toolbox.

**Size**

1000 MB

**Comment**

Video was recorded with the motion capture to help with the post-processing, but has later been deleted.

**Format**

csv, txt, sav, xls, avi, ipynb, mat

**Software**

Qualisys Track Manager (QTM), Matlab, Python, SPSS

**Metadata standard**

Dublin Core

**Storage**

- PC - Common/shared area, institution
- PC - local disk, institution
- SAFE (Secure Access to Research Data and E-infrastructure)

**Transfer**

- Unit FileSender

**Archiving**

Yes

**Degree of openness**

Open

**License**

CC-BY

## Archive

- Norwegian Centre for Research Data

# Headphones-Speakers dataset

## Description

This dataset contains full-body motion capture data as well as physiological measurements for a total of 34 participants. The data was collected individually, and people were asked to stand and listen to different types of rhythms and rhythmic music with both headphones and speakers.

## Data type

Dataset, Text, Other

## Language

English

## Keywords

motion capture, muscle sensing, emg, sound, music, standstill, headphones, loudspeakers, balance board

## Data about people

Yes

## Are there any other reasons why your data needs extra protection?

No

## Categories of personal data

Anonymous

## Sample size

40

## Security classification

Open

## Data collection period

01.04.2018 — 31.05.2018

## Collection devices

- Camera (photo and video), institution
- Sound recorder/dictaphone, institution

- Questionnaire - electronic
- Questionnaire - paper-based
- UiO Nettskjema

## Method

Observation, Recording, Experiment, Self-administered questionnaire

## Description

The experiment took place in the fourMs Lab at the University of Oslo between April and May 2018. The participants were invited to the laboratory individually and were asked to give written consent before the study began. Afterward, the participants were instrumented for the first listening session, which was headphones listening for one half, and speakers listening for another half of the participants. Each group was presented with the same set of stimuli in a randomized order. Participants were randomly assigned to one of the groups (starting with headphones or starting with speakers). In the final sample, 11 females started with headphones and 7 with speakers, and 7 males started with headphones, and 11 with speakers. Participants were asked to put on a motion-capture suit, and EMG electrodes were placed on each foot, forearm, and shoulder. In addition, a breathing sensor was placed on the torso. The EMG and respiration measurements were added for methodological experimentation, and will not be included in the current analysis. The same is the case for the data from the Wii balance platform that the participants were standing on (see Figure 3 for illustration of the setup in the lab). When ready, participants were asked to stand on the balance platform and remain in a relaxed, comfortable position during the experiment. They were asked to look in the direction of a white cross placed on a black wall in front of them (340 cm away from the platform). No specific instructions to move to the music or to try to stand still were provided. After the first recording session, the participants were asked to sit down and fill in the first set of questionnaires. When the participants were ready, the second listening session took place, followed by the filling in of the remaining set of questionnaires. The total duration of the experiment was around 1 h 15 min, with small variations depending on time spent on preparation and on filling in the questionnaires.

## Size

1000 MB

## Format

csv, txt, sav, xls, wav, avi, ipynb

## Software

Qualisys Track Manager (QTM), Matlab, Python, SPSS, Excel

## Metadata standard

Dublin Core

## Storage

- External hard drive (etc.), institution

- PC - local disk, institution
- PC - Common/shared area, institution
- SAFE (Secure Access to Research Data and E-infrastructure)

**Transfer**

- Unit FileSender

**Archiving**

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**Degree of openness**

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