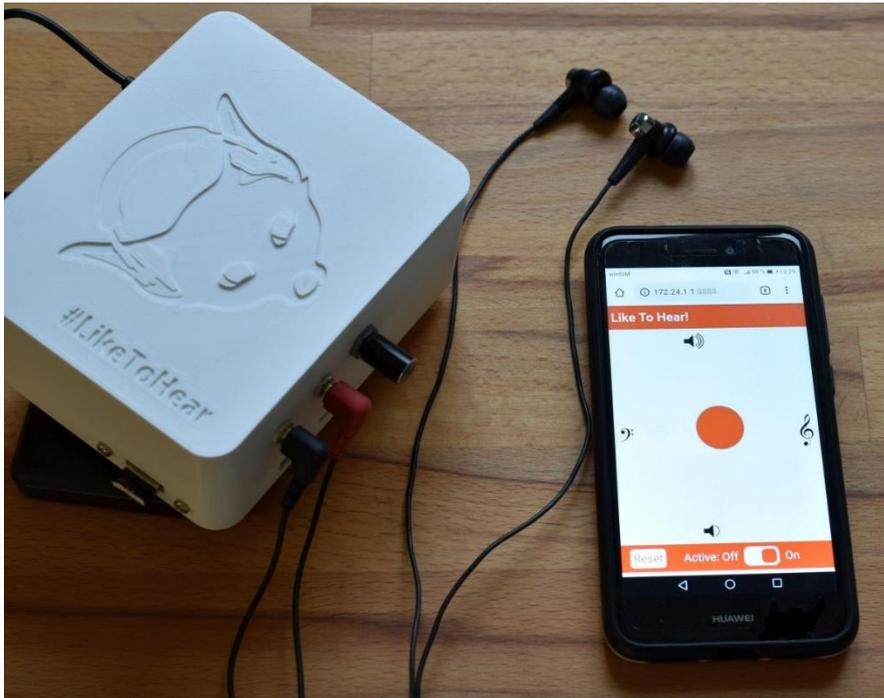


liketohear - enhancement and manipulation of environmental sounds, Workshop@Iac

Peggy Sylopp (contact@peggy-sylopp.net), Tobias Bruns (bns@idmt.fraunhofer.de)

- Real time sound processing on Raspberry Pi, controlled by web application
- Introduction to hardware setup, software architecture and installation



In the framework of the citizen science project "[Hear How You Like To Hear](#)" at Fraunhofer IDMT Oldenburg we developed an open source software for sound amplification and manipulation for the application in daily life situations.

We give an hands-on introduction to the use of hardware set-up (Raspberry Pi; Audio Injector) Jack Audio Connection Kit in connection with ALSA and ALSA-Tools:

- * openMHA (open Master Hearing Aid)
- * Raspberry Pi as wireless access point
- * Web app for sound amplification control
- * Enhanced sound recording
- * Raspberry Pi overlay (switch off Raspbian without killing installation)

We bring 5 hardware set-ups you can use.

It's also possible to get your own hardware: <https://github.com/liketohear/liketohear/wiki>

Github Repository

The github repository holds the information for a framework with intuitive gui control via web app for self-fitting the [mobile openMHA hearing aid prototype](#). The framework includes a web app for sound control, logs audio level analysis and self-fitting parameters.

The liketohear prototype is developed in the framework of the citizen science project "[Hear How You Like To Hear](#)" at the [Fraunhofer IDMT Oldenburg](#), funded by the [BMBF](#).

Corresponding author: Peggy Sylopp

Aims

The prototype was designed for intuitive app control in everyday acoustic environments, accessible and operable for everyone. This is realized by using affordable consumer hardware and open source software. The aim is to lower the entry barrier for self-fitting hearing aid development and facilitate any interested person to get actively involved in testing and improving hearing devices; to empowering power-users.

Hardware

Main ingredients Hardware:

- Binaural Microphones/Earphones
- Microphone pre-amplifier
- Raspberry Pi 3 model B
- Low-latency sound card
- USB power bank
- USB stick

Third party software:

- [A mobile hearing aid prototype based on openMHA](#)
- [openMHA](#)
- Raspbian
- [JACK](#)
- hostapd
- OpenSSH

Main characteristics

Free software: Control is yours, you can change every single bit of it! Efficient real-time implementations of research-approved hearing algorithms (c.f. openMHA at Github)

Competitively low delays: Less than 5ms Looks like wearing in-ear headphones Model for 3d print available

Some cool features

- very intuitive control by web app - no technical affinity necessary
- self-fitting
- logging of binaurals sound sceneries on USB stick
- based on presets
- Pre-configured SD-card image (~500 Mb) available for download
- No proper shut down of OS necessary: Overlay makes power cut possible without affecting the software installation
- Pre-calibrated for most "transparent" acoustic impression
- Autostart on boot
- Several hours of autonomy
- Connect via WiFi to the hearing aid prototype
- Fit it to your hearing thresholds
- Combine it with any jack-based software (play, process, or record)

More Instructions

The workshops follows these instructions and gives more detailed background informations:

<https://github.com/liketohear/liketohear/wiki>