Open community platform for hearing aid algorithm research

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06/26/2017
The open Master Hearing Aid - openMHA

What?

- Open-source software for hearing aid algorithm development and evaluation
- Low-delay (< 10 ms), real-time signal processing framework
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- Proprietary systems that are not accessible to the research community and underlie commercial constraints
- Facilitation of collaborative efforts and reproducibility in hearing aid research
- Lower barriers for accelerated studies with novel algorithms
- Smooth transfer of research results into application

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First major release available since June 21, 2017 on GitHub
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Project partners and support

Who?

University of Oldenburg
HörTech gGmbH (Oldenburg)
Bat&Cat SoundLabs (Palo Alto)
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... pays?

Funding

National Institutes of Health initiative to develop real-time portable signal processing tools for advancing research on hearing loss compensation (NIH Grant 1R01DC015429-01)
Basic framework for implementation of algorithms

- MHA host application
- libopenmha toolbox
- communication interfaces to control applications and for audio I/O
- runtime configuration changes

Diagram:

```
openMHA
  ▼
  libopenmha
  ▼
  plugins
  ▼
  MHA
  ▼
  IO
  ▼
  audio backend (Jack, File, TCP)
```

control applications (e.g., Octave)
Ingredients

Basic framework for implementation of algorithms
- MHA host application
- libopenmha toolbox
- communication interfaces to control applications and for audio I/O
- runtime configuration changes

Tools and documentation
- Octave/Matlab GUI for hearing aid fitting
- manuals for different usage scenarios
- example configuration files for algorithms included
Hearing aid processing plugins

- calibration
- multi-band dynamic compressor (DC)
- feedback reduction
Hearing aid processing plugins

- calibration
- multi-band dynamic compressor (DC)
- feedback reduction
- binaural coherence filter
- bilateral adaptive differential microphones (ADM)
- beamforming algorithms (delay-and-sum, MVDR)
- single-channel noise suppression
Target groups

I  Audiological researchers
   - Measurements out-of-the-box on PC hardware
   - Change parameters on application level

II Application engineers
   - Set up measurement tools and customize algorithms
   - Access configuration interface at an advanced level

III Plugin developers
   - Develop and implement new plugins in the openMHA framework
   - Work on one platform.
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... work on one platform.
The openMHA

... provides a real-time processing platform for hearing aid algorithm development.

... is designed to evaluate, compare and bring into application novel hearing aid algorithms for future hearing aid generations.

... runs on standard PC and sound hardware (Linux OS, more to come) as well as Beaglebone Black ARM and similar platforms.
The **openMHA**

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... runs on standard PC and sound hardware (Linux OS, more to come) as well as Beaglebone Black ARM and similar platforms.

... will be further extended based on latest research and contributions from the hearing aid research community.
Get openMHA

openMHA is open source under AGPL-3.0 license

Latest news:

🔗 www.openMHA.org

Open source code available here:

🎵 https://github.com/HoerTech-gGmbH/openMHA

Disclaimer Research reported in this publication was supported by the National Institute On Deafness And Other Communication Disorders of the National Institutes of Health under Award Number R01DC015429. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.
Get openMHA

Open community platform for hearing aid algorithm research

The project Open community platform for hearing aid algorithm research funded by the National Institutes of Health (NIH Grant 1R01DC015429-01) aims at sustainable, focused research towards improvement and new types of assistive hearing systems.

Project Overview (pdf)

openMHA is an open-source software platform for real-time audio signal processing. For download instructions see Download.

!!! Latest news: 2017 Release of openMHA available

See News for more information and announcements.

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Latest news:

聾 www.openMHA.org

Open source code available here:

https://github.com/HoerTech-gGmbH/openMHA

Disclaimer Research reported in this publication was supported by the National Institute On Deafness And Other Communication Disorders of the National Institutes of Health under Award Number R01DC015429. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.