Modules and perspectives of the Virtual Hearing Clinic (VHC)

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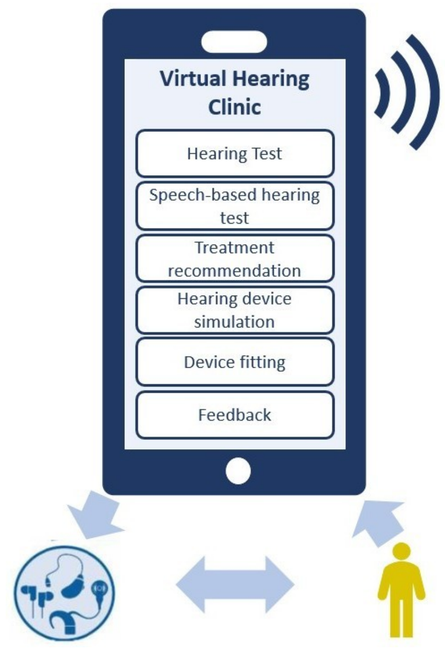
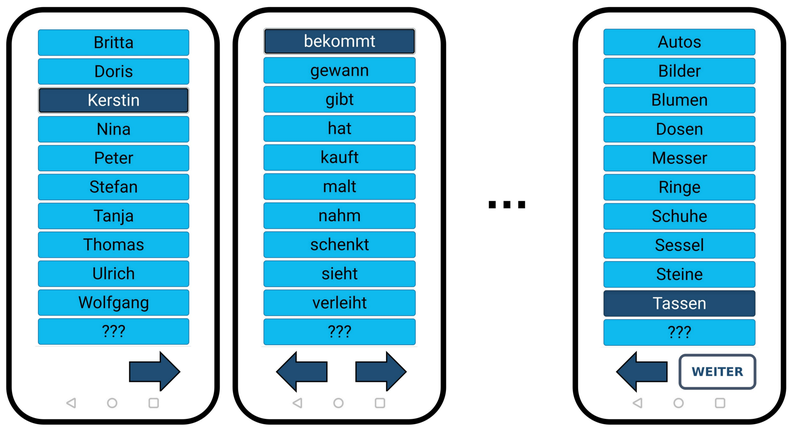
AIM OF THE VHC

- Connection and further development of modules from within the cluster, e.g. implementation of further measurement modules
- Enables easy access to diagnostics and hearing support via mobile devices, by:
  - Self-guided Diagnostics by different integrated measurement modules
  - Prognosis of treatment success for cochlear implants (CI)
  - Hearing aid simulations
  - Self-adjustment of sound finetuning by the users
- Treatment recommendation based on the audiological assessment



DEVELOPMENT MEASUREMENT MODULES

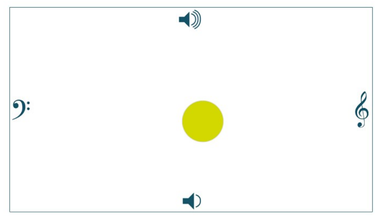
- **Hearing threshold** assessed with the „graded response bracketing“ (GRaBR) - method for measuring the audiogram [1]
  - GRaBR: Detecting hearing thresholds with 3-AFC procedure and an adaptive stepsize of soundlevel
- **Speech intelligibitlity** assessed with the Oldenburg sentence test (OLSA) and new OLSA- interface optimized for smartphones [2]



- **Loudness perception** assessed via Adaptive Categorical Loudness Scaling [3]
- **Patient information** obtained via a questionaire developed for the VHC. App users can be classified into help- and non-help seekers, which allows for targeted interventions to motivate non-help seekers [4]

DEVELOPMENT FEEDBACK & RECOMMENDATION MODULES

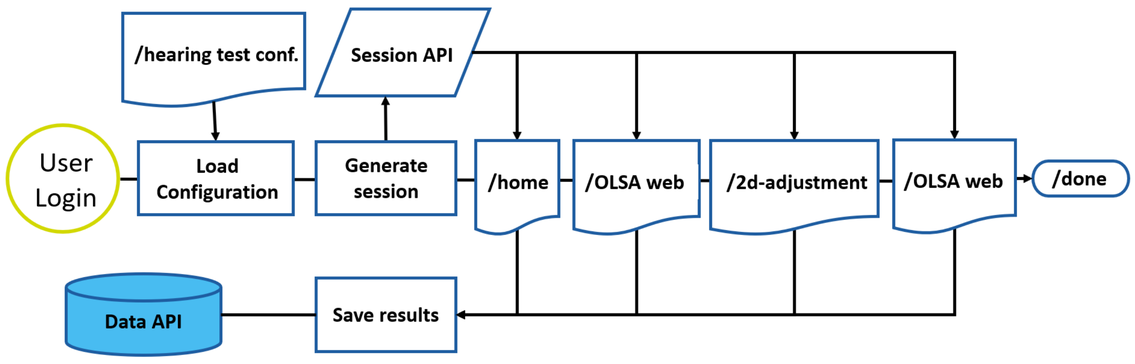
- **Statistical Classification** avaible to classify users into 13 Auditory Profiles to access statistical background information [5,6]
- **Self-adjustment of a simulated hearing aid** via developed 2D Touch interface [7]



- **Implementation of an individualized meta-parameter space** by using models to provide settings with a certain speech intelligibility and limited loudness [8]
- **Postoperative performance prediction for cochlear implants** via a decision tree model using relevant ENT-related indicators (course and duration of deafness, PTA4, age,…) [9]

TECHNICAL SETUP OF THE VHC

- Browser-based app / platform
- Python & Python Flask-based setup
- Security:
  - Sensible data is located on secure servers
  - Pseudonymization of data via user and session IDs
  - Data API secures the data flow
- Modular setup of the VHC allows for an easy addition of additional measurement and feedback modules
- Custom configuration and compilation of measurements for the individual users



PERSPECTIVES

- Including an ASR-based speech test module
- Adequate calibration of smartphones with household items
- Implementation of the open Master Hearing Aid for hearing aid simulation
- Implementation of hearing impairment simulation to preventively sensitise for hearing disorders or conduct studies with
- Personalized first fit of a simulated hearing aid based on profiles

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