CCI-MOBILE: OPEN- SOURCE APP DEVELOPMENT FOR REAL-TIME COCHLEAR IMPLANT PARAMETER ADJUSTMENT

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Cochlear Implant Laboratory

1. INTRODUCTION

- "Costakis" CCi-MOBILE – Cochlear Implant Research Platform: a portable, customizable research platform for CI (cochlear implant) & HA (hearing aid) uni-lateral, bi-lateral, and bi-modal research[1]
  - Perform custom sound processing
  - Designed for use with CI, hearing aid (HA), and bimodal (CI+HA) listeners
  - Open-source MATLAB applications
- Addition of open-source Android app intended to provide more flexibility for researchers in field testing of algorithms, as well as ease for listeners
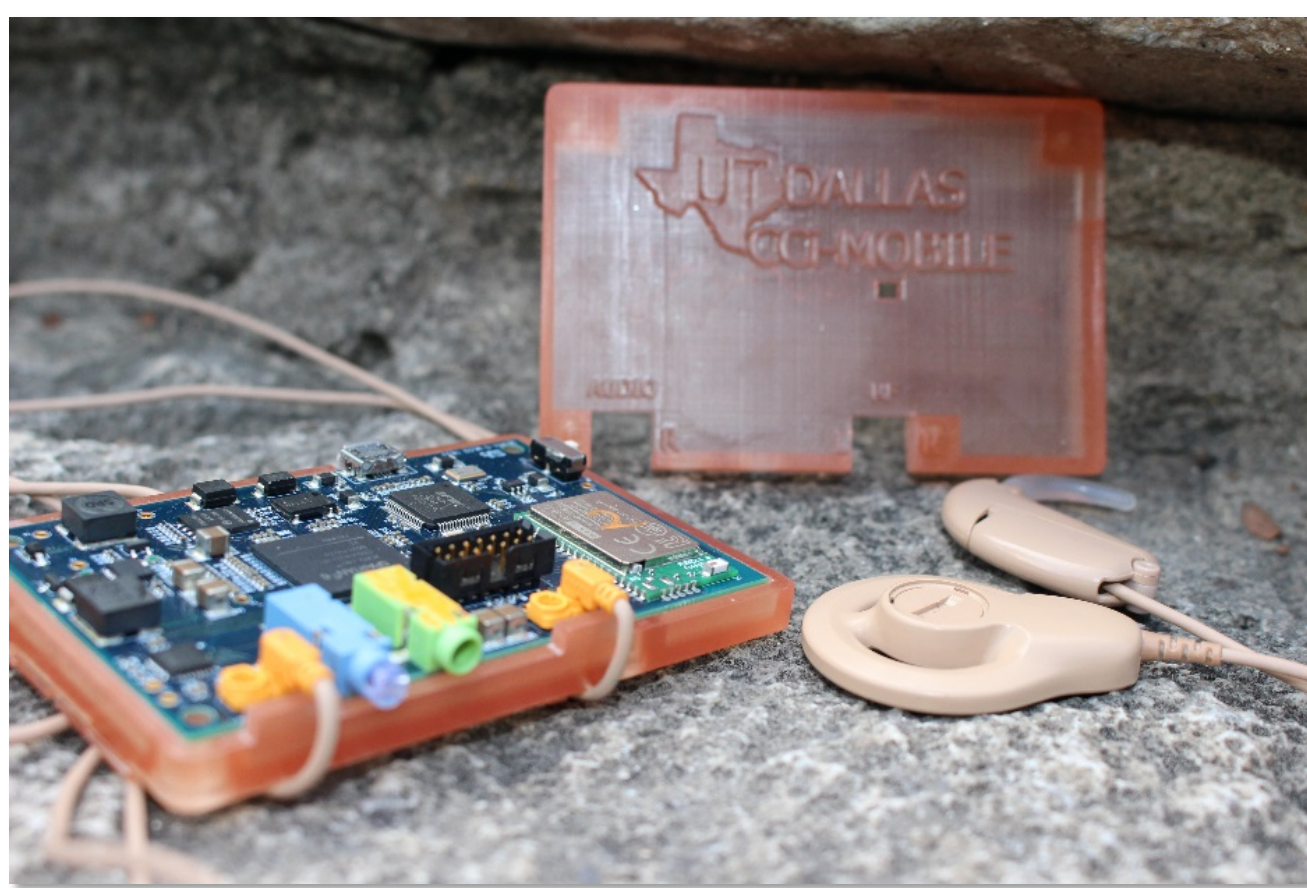
CCi-MOBILE Research Platform

2. SPECIFICATIONS

- Android development written in Java using Android Studio 3.4
- Requires an Android smartphone or tablet
  - Min. Android version 5.0 (Lollipop)
  - Target Android version 9 (Pie)
- CI user MAPs formatted as JSON files

3. APPLICATIONS

- This app provides a general foundation for researchers to customize to their needs
- Ideal for diverse listening experiments such as on-the-go, offline field testing in real world environments and take-home trials

3. APP OVERVIEW & FUNCTIONALITY

- Real-time adjustment of CI parameters
  - Sound processing strategy
  - Number of maxima
  - Stimulation mode
  - Stimulation rate
  - Pulse width
  - Sensitivity
  - Gain
  - Volume
  - Q-factor
  - Base level
  - Saturation level
  - Stimulation order
  - Window
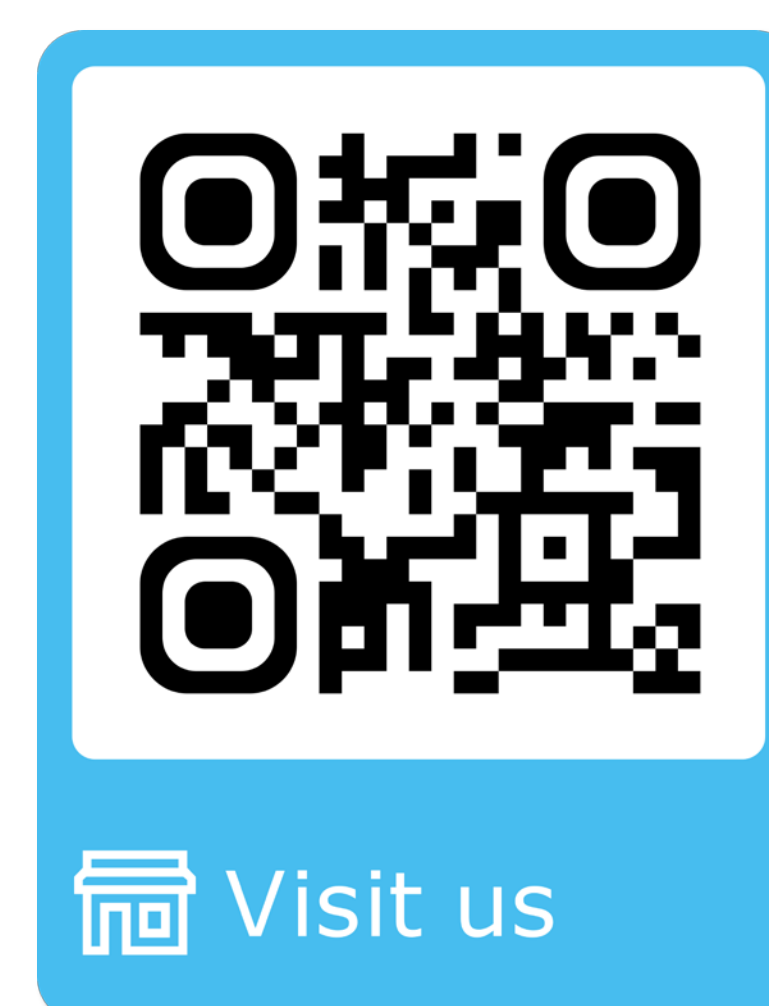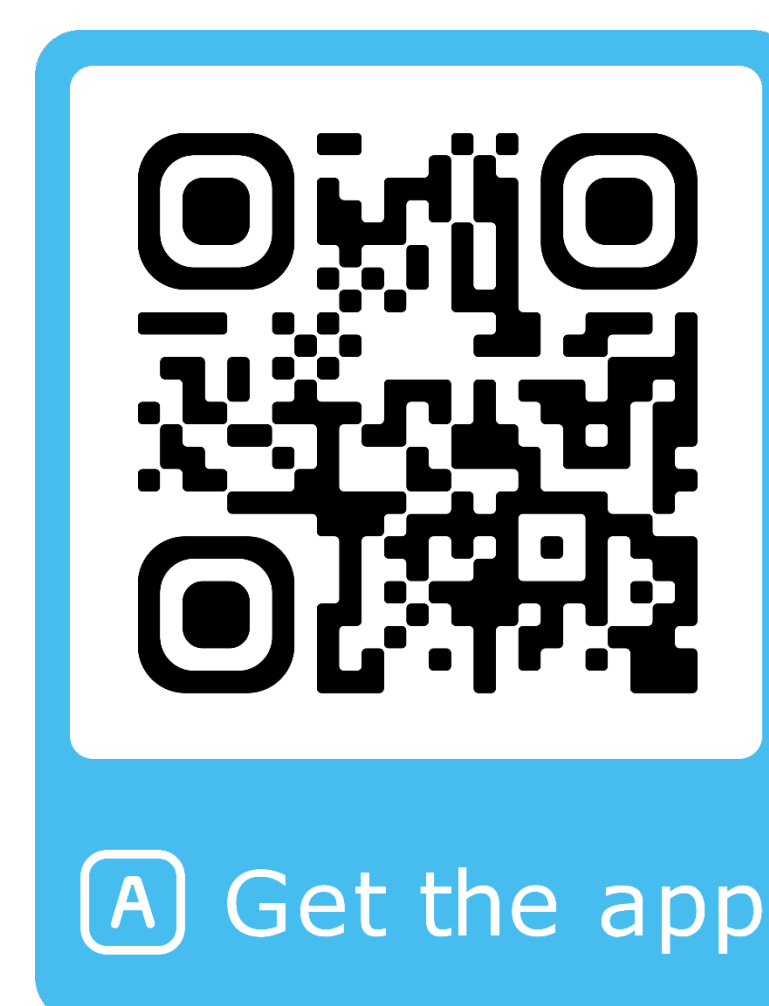- Loading, editing, and saving user MAPs in JSON format
- Streaming controls for CCi-MOBILE
- Quick-select menu for researcher-defined environmental presets (e.g., school, driving, music)
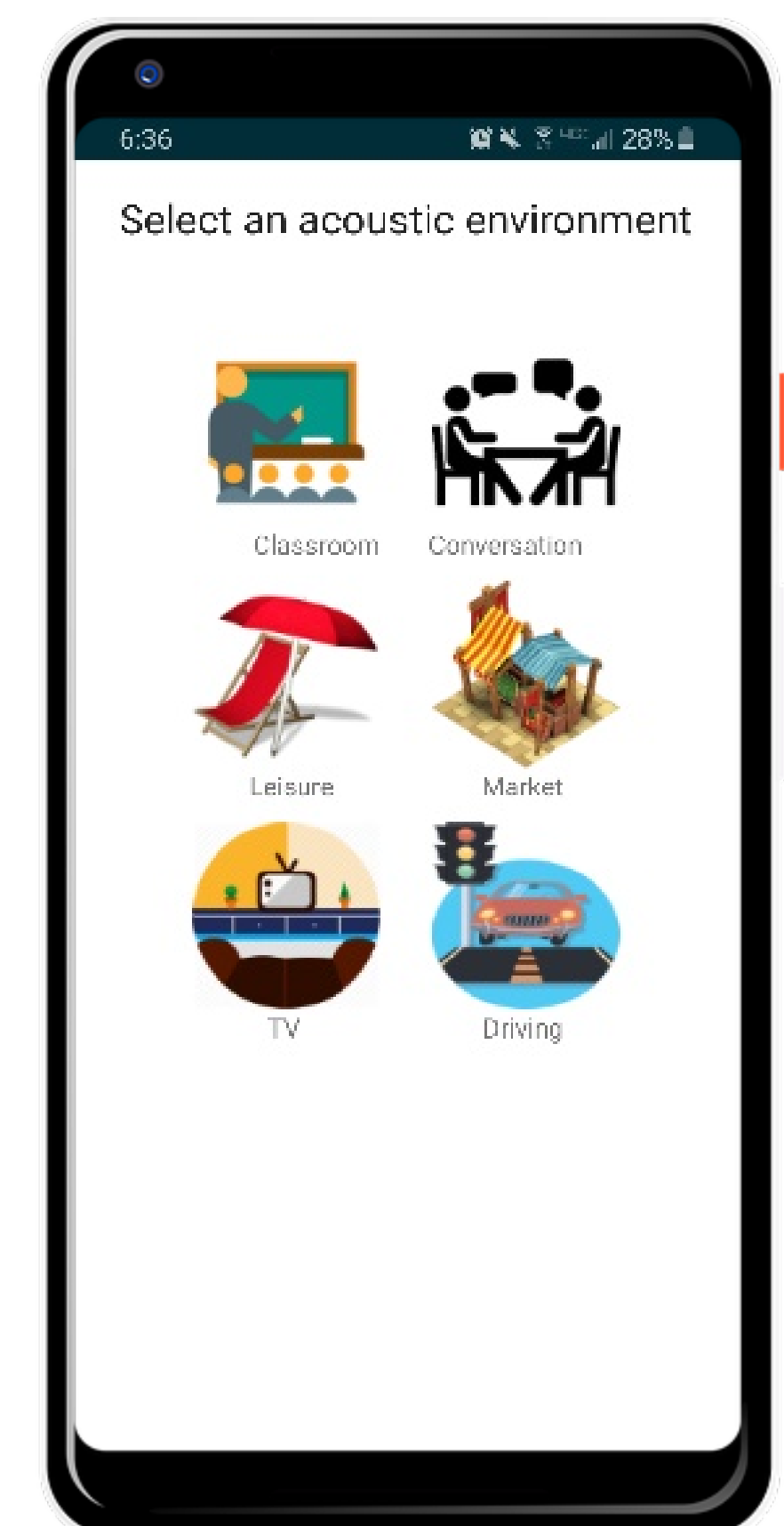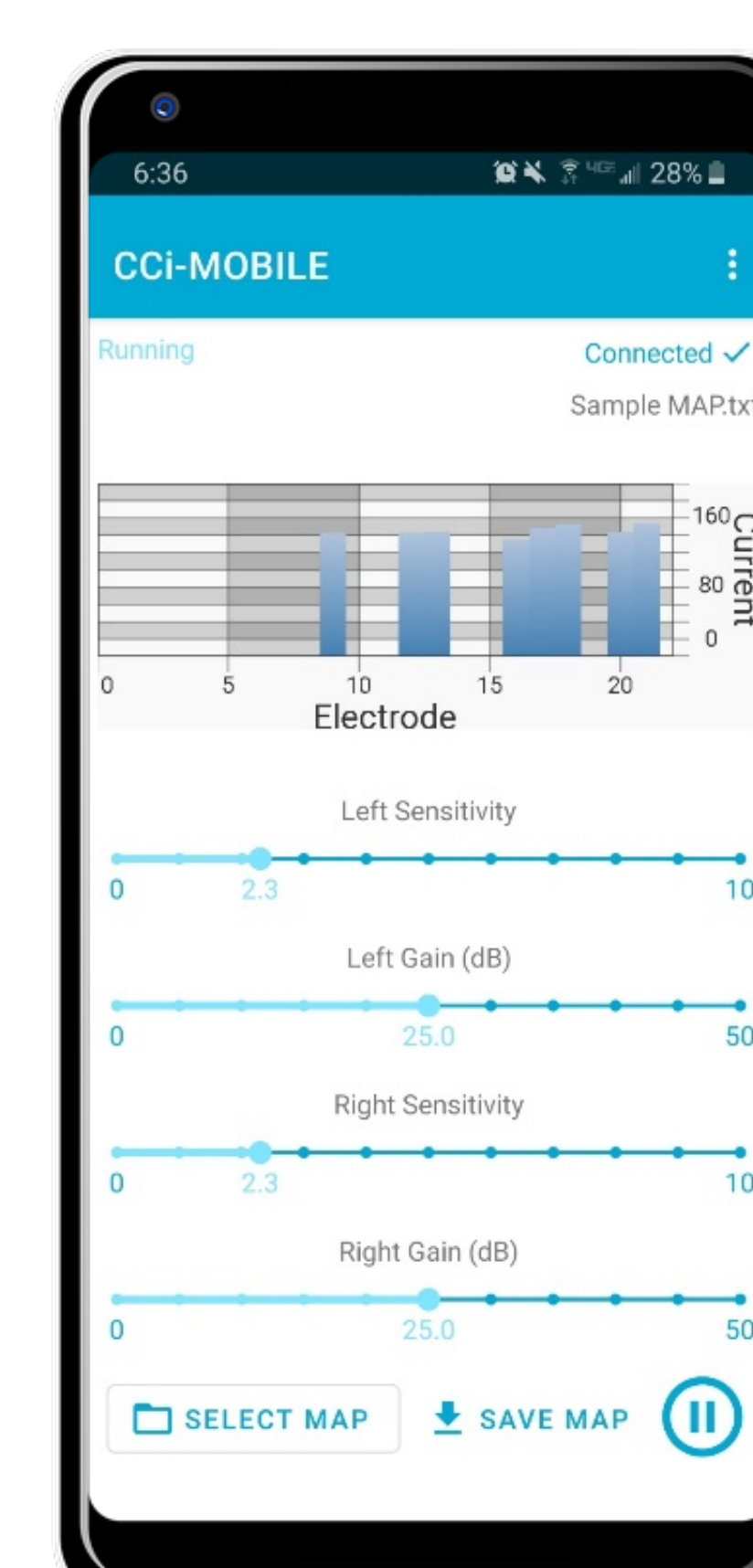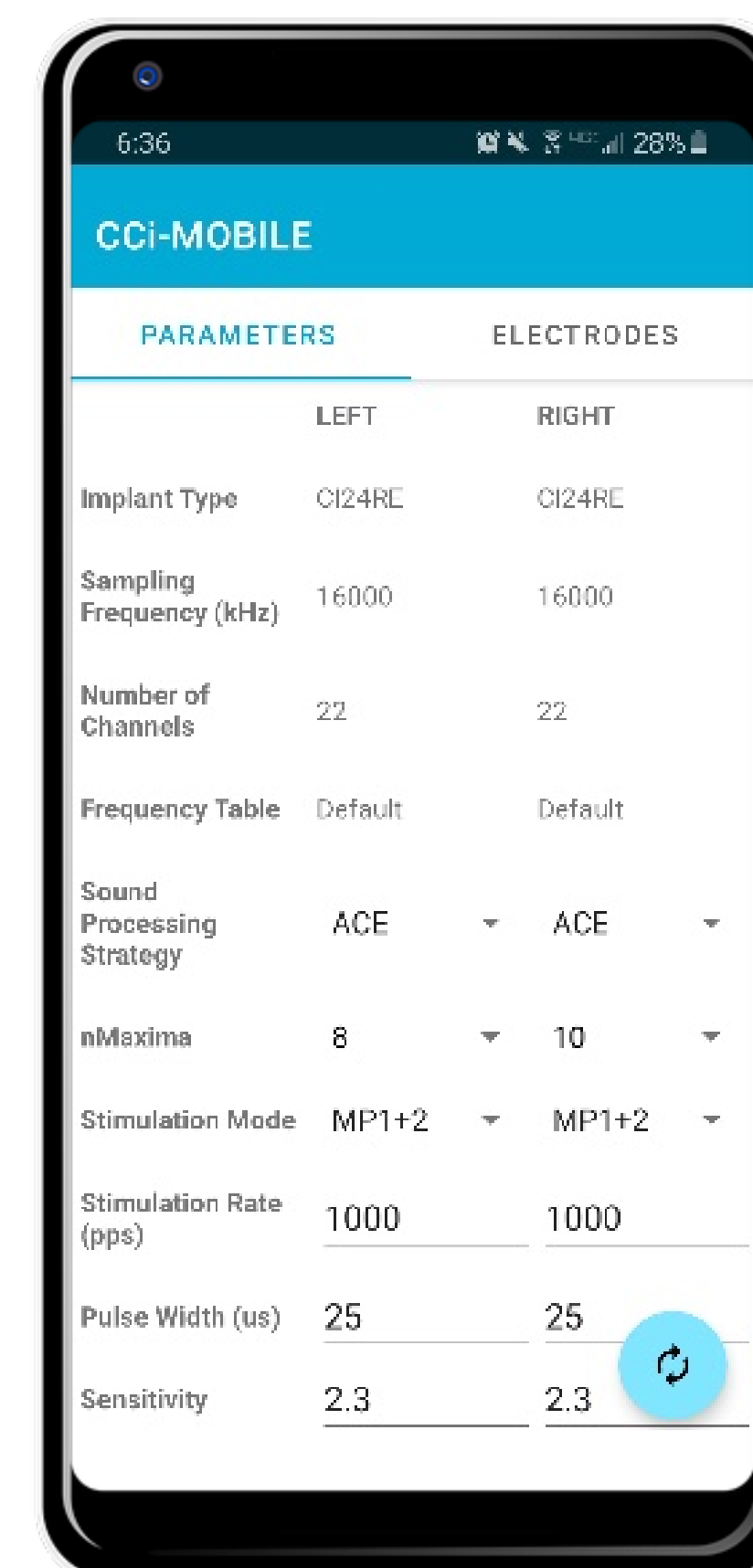
Using the Android app on-the-go (top) and screenshots (bottom)

4. RESOURCES

Fork us

Get the app

Visit us

- Fork our repository on GitHub
- Download the app for free on the Google Play Store
- Visit our website for more information

REFERENCES

[1] J.H.L. Hansen, H. Ali, J.N. Saba, R. Charan, N. Mamun, R. Ghosh, A. Brueggeman, "CCi−MOBILE: Design and Evaluation of a Cochlear Implant and Hearing Aid Research Platform for Speech Scientists and Engineers," IEEE EMBS Inter. Conf. Biomedical and Health Informatics (BHI−19), May 19−22, 2019.