Development of Android app for reverberation time measurements

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Nowadays, room acoustics has received more and more attention. One aim of it is to develop different method to evaluate the acoustic performance of the rooms and to address human acoustic comfort needs. Meanwhile, reverberation time is one of the most important parameters in room acoustics. It is employed as a standardized method to evaluate the acoustic comfort of an enclosure.

This project aims to build an Android app to measure the reverberation time of indoor environment through generated impulse (such as hand clapping), allowing users to test reverberation time of rooms under a quiet environment conveniently with their Android phones. It also provides relevant convenient and practical little functions, such as allowing users to take notes about tested rooms, for example, room name, size, photo, check measurement history, export measurement data and draw line charts.

Issues at work:
✧ How to measure reverberation time at different Octave Bands through java coding?

✧ How to decrease the effect of external noise and record impulse more accurately?

✧ How to make measurement more convenient and more clear for users?

Besides the acoustic background theories, some other knowledge in signal processing is also used in the code work.

Suitable improvements to increase the accuracy of sound recording are applied and a special algorithm to calculate reverberation time results is developed.

The function of drawing line chart of measurement results gives users a clearer view about the level and trends of reverberation time results. Exporting measurement results function allows users to record and store test results. Setting detailed test room information and taking picture functions help describe testing environment better.

Result
The results of this app measured are close to the standard results gotten from professional acoustic equipment sometimes but can not be as stable and accurate as the standard ones, especially when the testing environment is not quiet enough. So the results from this app are more suitable to be a reference of our acoustic measurement, but it is still a convenient and fast reverberation time measurement app.

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