Course overview and step-by-step instructions
ET2573 App development with audio applications – from m-file to app

Part 1. Literature survey

1. Do a small literature survey and internet search on Voice Activity Detectors and Baby Alarm Detectors. How do they work?

2. Voice Activity Detectors for conference telephones can be quite advanced, while there are also very simple voice detectors based on energy levels and simple filters. There is one short research paper provided by the teacher, read this to get an example of a method.

3. Find some Android apps and open source algorithms to study. Note references to a few examples that you find relevant and add a comment or opinion about them.

4. How does simpler stand-alone commercial Baby Alarms work?

5. Send in a short report, where you briefly summarize the survey above. Also suggest in brief words or pseudo-code an algorithm or a way you would like to use to solve the task of implementing a baby alarm. **This should be done within three weeks in order to be registered as an active student on the course, so send in something! By approval the first part of four is completed.**

Part 2. Matlab implementation and evaluation

6. Choose one advanced and one simpler algorithm to implement in Matlab. Use the knowledge from part one of the course. Also, the teacher can here provide some suggestions regarding algorithms.

7. Using Matlab, implement, test and evaluate your algorithms in different background environments (no noise, computer noise, cocktail noise, car noise, music) and different background noise levels by simple mixing (adding files with different strengths). Some sound files are provided by the teacher. Students are encouraged to record more examples of background noise.

8. Expand your report on the survey to include a description of your two Matlab implementations. Elaborate on why you have chosen these and refrained from others. Append the Matlab code, which should be commented and explained. The report should not be sent to the teacher in this step.

9. Expand your report with a performance evaluation, both for the advanced and the simpler method. The report should not be sent to the teacher in this step.

10. Select which algorithm you are going to try to implement as an app and keep in mind to keep it simple enough. Maybe the simpler algorithm with some simplified key features from the advanced algorithm will do?

11. Send in the complete theoretical report together with your implementation, and motivate your choice of algorithm to implement as an app. **Hereby the first two parts of four of the course are completed (when approved). This should typically be done after half-time of this summer course, but may take somewhat more time if needed.**

Part 3. Java implementation for Android

12 Ask the teacher to send you the Baby Alarm framework.

13. Read the short paper on Eclipse and Android App implementation and install the Eclipse Environment on your Computer. Interact with each other and the teacher for the installation. Android Studio can be used instead of Eclipse if you prefer.

14. Test-run the Baby App included in the framework and get familiar with the code.

15. The framework is prepared to enable inclusion of your implementation. Implement your version and run it. Send the app code to the teacher for evaluation and approval. **This completes the third part of four in the course (by approval).**

Part 4. Final evaluation

16. Finish your work by expanding your report with a description of your app implementation and compare it with the one you received in the framework. Try to make yours the better one, at least in some aspects!

17. Iterate the report with the teacher.

18. Book half an hour for a meeting at campus or on Skype with the teacher and examiner in the second half of August (there will be another opportunity in September). **Hereby the fourth part of four is completed (by approval).**