IPRO 344
Improving Energy-Efficiency and Offering Quality Audio in Mobile Devices

Objective

The goal of IPRO 344 was to review the previous semester's work on Class D and Class A/B Audio Amplifiers, procure components for and build complete audio amplification and filtering pipelines and extend the experimentation from efficiency to sound quality, particularly applicable in McDonald's Drive Thru system.

Basic Organization and Tasks

During the first half of the semester, the Research, Purchasing and Documentation team were particularly active, reviewing how far we were and what we needed to do to further our goals. The latter half of the semester was spend building and testing the audio pipelines and testing them extensively by all members, especially the Implementation team.

Accomplishments

Our goals for the semester were realized. We created the components of various pipelines successfully including the Pre-Amplifier and Post Amplification Filtering and tested them with microphones and sound systems with equal success in terms of efficiency and sound quality. Moreover, we all learnt a lot about how salient features like microphone positioning, feedback and linguistics play a role in the quality of sound.

Critical barriers and obstacles

We did not get a chance to visit the McDonald's facility this semester and therefore, could not understand their system in totality. A lot of time was spent procuring components, and because of that work started a little later than expected. Besides that, however, the learning has been immense and future semesters will be assisted by our research efforts.

Conclusion

IPRO 344 has achieved significant progress in addressing the important issues regarding the quality of a Drive Thru's audio system. This semester's work will undoubted prove to be invaluable in the realization of a complete Drive Thru audio system in future semesters.

Next steps

This IPRO will have several facets to it now onwards. Members will have to give equal attention to an effective audio pipeline design and possibly greater signal processing within this system. It is necessary to focus on the microphone and loudspeaker sections in greater detail to obtain better sound quality as well as speech characteristics to configure the system using that knowledge. It would be prudent to develop strong ties with McDonalds and companies like Shure Inc. that can provide us with equipment for our academic purposes.

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