

Noise-Reducing Speaker System

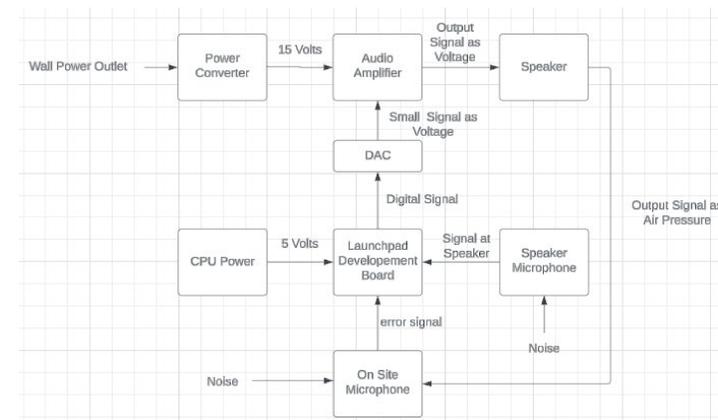
Project

It can be difficult to sleep when people outside your home or apartment are being loud. Furthermore, noise-reducing apparatuses are not designed for sleep and can cause irritation after prolonged use.

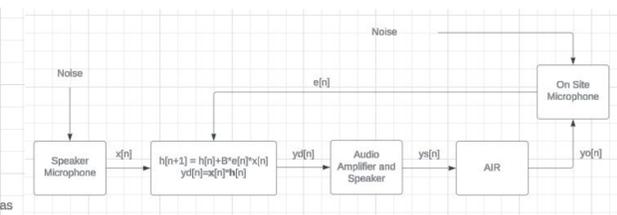
My project aims to reduce noise in a small area, with this prototype focusing on canceling individual tones and frequencies.

System

Functional Block Diagram



Software Diagram



Methods

- My project utilizes high speed convolution to modify the output of the speakers to accommodate the way sound changes as it moves through a room.
- I also incorporated adaptive filtering to change the filter on the fly for easy setup and operation.
- I used a F28069m microcontroller for fast computations and data processing.

Conclusion

- Designing Complex systems takes time and often results in several design iterations.
- Familiarity with hardware goes a long way, and unfamiliar hardware takes time to gain proficiency.
- Future designs of this project will need to overcome hardware limitations on accuracy and processing speed found in the F28069m microcontroller.