

Infant Earmuff System

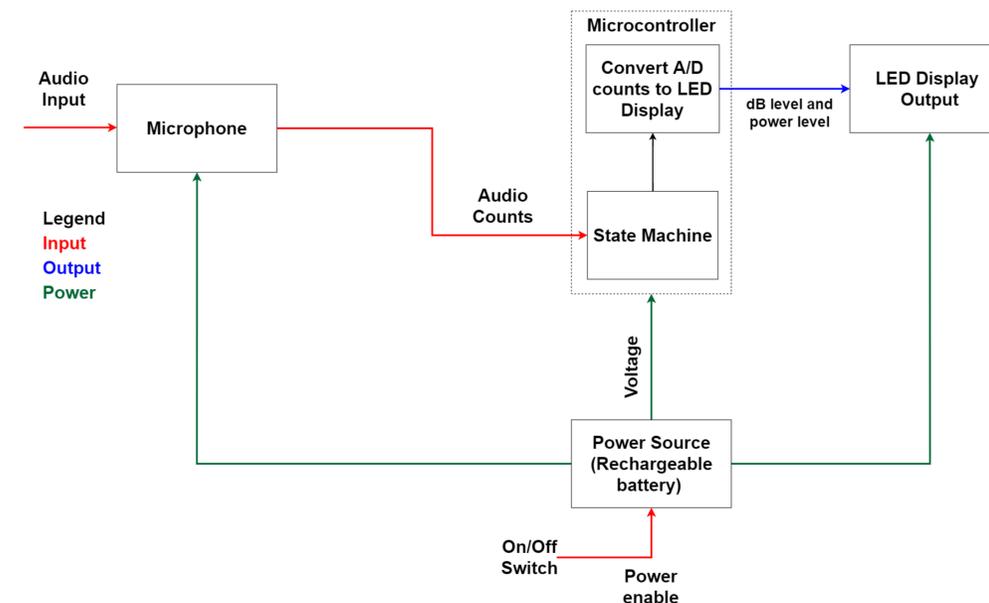
Project

The Infant Earmuff System allows caretakers to prevent hearing damage in infants when wearing the device.

- Infants have smaller ear canals and are therefore more susceptible to hearing damage than adults
- Hearing damage in infants is permanent but infants are bad at communicating if the noise level is too loud.
- The Infant Earmuff System allows caretakers to understand the level of noise an infant is hearing and whether that level is dangerous.



System Diagram



Methods

The Infant Earmuff System makes use of an existing pair of infant hearing protection earmuffs, a sound sensor, a microcontroller, and an LED display.

- The sound sensor reads in the input sound from within the cavity of the earmuff. The sound sensor transmits this signal to the microcontroller.
- The microcontroller processes the input signal from the sound sensor and converts the signal to decibel levels.
- The microcontroller uses the decibel levels to choose the proper LED display
- The LED display consists of six LEDs: 2 green, 2 yellow, and 2 red. 1 Green LED correlates to low levels of sound, and 2 red LEDs correlate to dangerous levels of sound.

Conclusion

This design achieved all major aspects of the desired project. The system computes sound and converts it to an LED display. The current system will decrease the amount of hearing loss in infants when used properly.

The Infant Earmuff System needs a lot of future work, however.

- The system was larger than expected and all the components could not fit within an existing pair of infant earmuffs. Future work would include decreasing the size of the system.
- The system is very specialized for users at loud events, but a future version will include a more portable version that could be put onto a car seat.
- A future version would also include an app to alert the caregiver of hearing damage along with the LED display.