CMPEN 462
Mini Project
Due 27 April 2022

Echolocation

In this mini project, you would design an acoustic echo-location sensor. Consider a 1D array of sound speaker, receiver, and reflector at locations 0, 1, and 1.2 meters respectively on the x-axis. The receiver would receive direct line of sight signals from the speaker as well as the reflections from the reflector. The direct path and the reflected path are separated by 40cm. The channel impulse response (CIR) would have two peaks separated by 40cm. Your goal would be to design a system that measures the distance of the reflector from the receiver. The project would be evaluated based on a demo. The CIR peaks corresponding to direct and reflected path would move relative to each other if the reflector is moved. The echoes can be detected from the CIR. You need to design a training sequence at the transmitter to be able to detect the CIR. You can use your own smartphones as transmitters and receivers to generate and receive the sound signals.

More Details

- You are expected to work in groups of two on this project.
- You can demo this project to the TAs anytime before the deadline. Please work with them to schedule a time. Your code needs to be uploaded on canvas.