SUMMARY

In this project, we propose a technique for the localization of impulsive acoustic disturbances (like gun shot, explosion, collision, accident, etc.) in the environment. Time difference of arrival of the acoustic signal at different acoustic sensors (microphones) and Compressive sensing will be utilized to identify the location of the impulsive acoustic source. The performance of the developed algorithm will be tested with the help of computer simulations. We also propose the hardware implementation of the developed algorithm in an indoor environment using wired sensors and an outdoor environment using wireless sensors.

Acoustic impulsive source localization is important for the continued development and safety of industrial and civil complexes in Saudi Arabia. This research project will help to create a sense of safety and relaxation for the citizens as they will be sure of instant assistance in case of any accident while driving or shopping in malls. In industrial complexes, the instantaneous localization of an explosion is also vital for taking immediate actions to minimize fatalities and damage to property. As the proposed project involves both software & hardware design and implementation, it will help the involved researchers and students to gain knowledge and hands on experience of using acoustical information in wireless & wired environment using digital signal processing techniques.