



# GPS Sound Sensor for Rescue Assistance

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## Background

Poorer countries may not have enough personnel for search and rescue (SAR) after a disaster and rely on international SAR (ISAR) teams. By the time ISAR teams arrive to start their search, it may be too late to save lives.

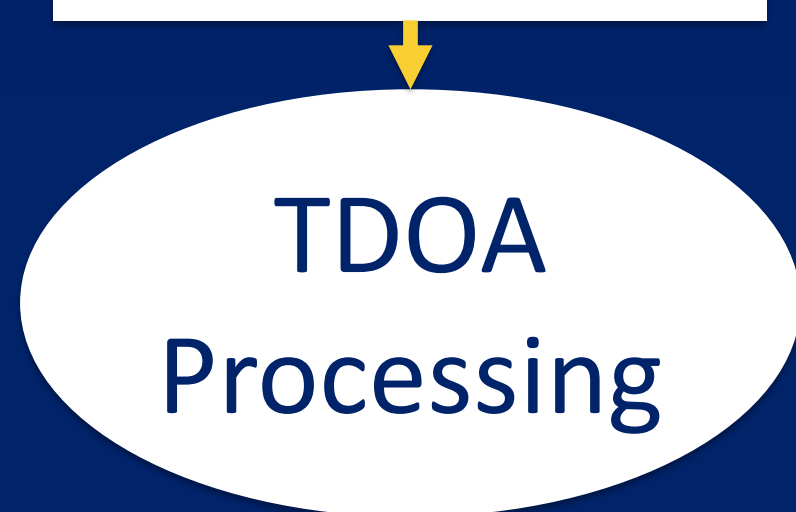
## Project Goal

Our project will provide a device that can potentially acoustically detect a survivor and send relative direction of their voice to a phone or other display. Governments low on human resources can quickly deploy these devices and acoustically cover more area. Locating areas with audible survivors can help agencies disperse medics to minimize deaths and recruit able survivors to join the search.

## Milestones

Week 3	Components Testing, Frame
Week 5	TDOA program
Week 7	GPS/Compass integration
Week 9	Prototype testing

Microphones



Relative direction

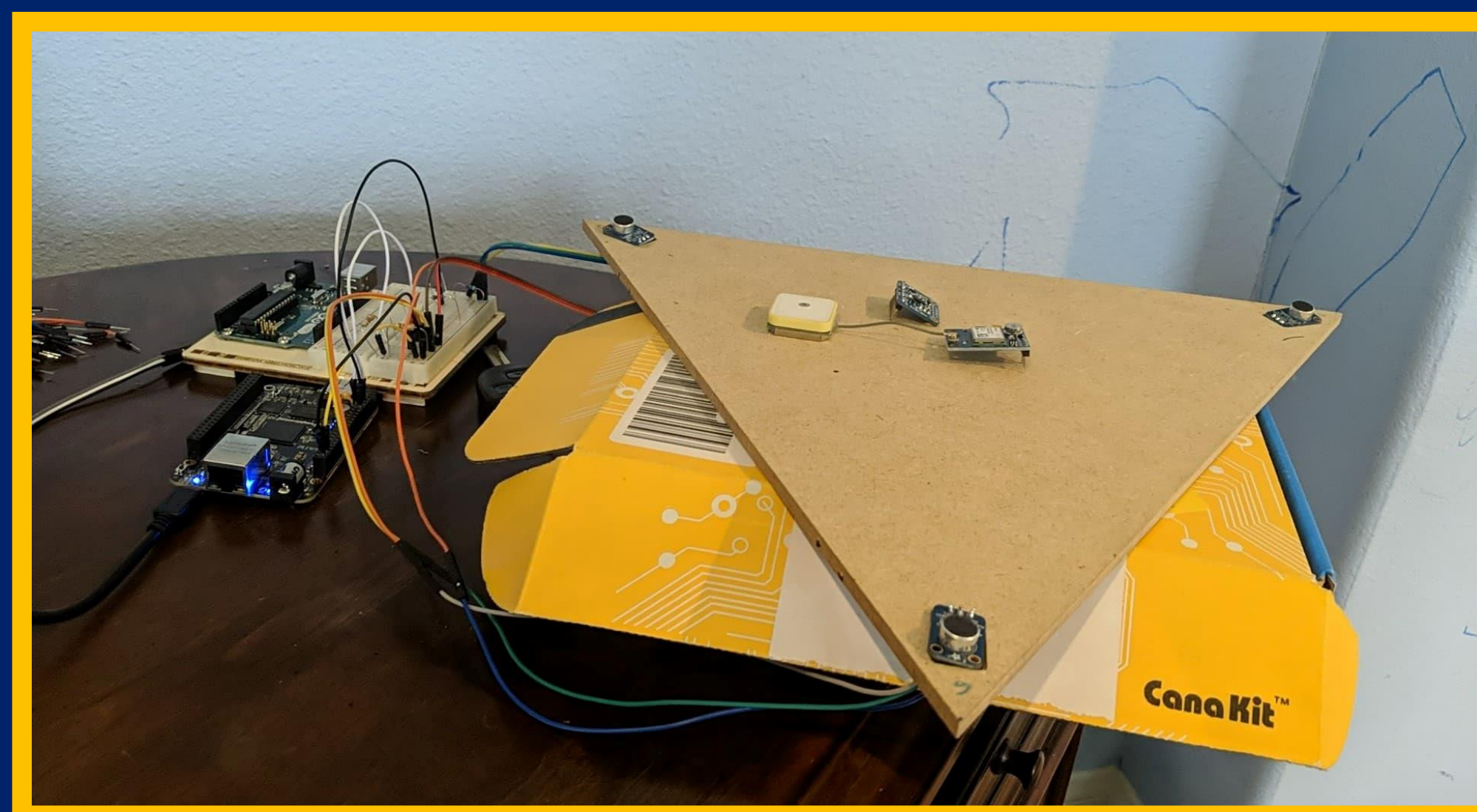
GPS and Compass

Coordinates and heading

Device

Absolute direction of sound

Handheld Device



## Required Components

- Microcontroller: Beaglebone Black
- Microphones: Electret with MAX4466 amplifiers
- GPS receiver: NEO-6M (GY-GPS6M)
- Digital Compass: LSM303

## Standards

- GPS: UART, NMEA Communication Standard
- Compass: I2C
- App Communication: TCP (Ethernet/WiFi)
- BeagleBone Black: SSH, SFTP

## References

[1] A. Bartolucci, D. Walter, and T. Redmond, "Comparative Review on the Cost-Effectiveness Analysis of Relief Teams' Deployment to Sudden-Onset Disasters," *Prehospital and Disaster Medicine*, vol. 34, no. 04, pp. 415–421, Dec. 2019.

[2] A. Agarwal, N. Goel, S. Banerjee, and H. Kar, "Detection of Audio Source Direction Using Autonomous Robot," 2006.

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[4] Švec Jan G. and S. Granqvist, "Guidelines for Selecting Microphones for Human Voice Production Research," *American Journal of Speech-Language Pathology*, vol. 19, no. 4, pp. 356–368, 2010.

