#### Project Title: Acoustic Awareness Enabler

#### Requester: Karen Payton

#### Phone/Email: x8434 / kpayton@umassd.edu

#### Company: ECE Dept, UMass Dartmouth

#### Address:

#### City: State: Zip Code:

#### Date: July 31, 2019

### Please note that all RFP Forms must be completed by or before August 1 of a project cycle. If you have any questions regarding the RFP process for Senior Capstone Projects, please contact the College of Engineering at 508-999-8539. Email inquiries may be sent to rlaoulache@umassd.edu

**Title:**

# Acoustic Awareness Enabler

**Description:**

When I’m watching a video on my computer or ipad, I usually wear earbuds. The audio volume through the earbuds blocks other sounds in the room, including other family members trying to ask me a question. I’m looking for a device that fits between a headphone plug and the audio jack (or USB port) on either a phone or computer. The purpose of the device is to detect environmental sounds above an adjustable threshold. If the sounds rise above the threshold, the device should at least attenuate the stereo signal on the audio channel or, preferably, pause the audio until the external sounds have dropped below threshold for a sufficient amount of time.

**Diagrams *(optional)*:**

*<Insert block diagrams, flow charts, assembly drawings, schematics, etc. to better describe your needs.>*

**Scope:**

I expect a printed circuit board, hopefully in an enclosure with the required interfaces. When the threshold setting is at its highest, the audio will not be interrupted or paused. At the lowest setting, sounds greater than ~30 dB SPL will trigger the system. If ports other than audio ports are used, there must be clear instructions how the user selects the correct audio output for their device.

**Known constraints *(if any)*:**

* Hardware (subject to change)

*The device should be small and low power.*

*There needs to be a way for the user to adjust the threshold (display is optional).*

*It may need batteries unless it can draw power from the USB port.*

* Software (subject to change)

I don’t expect there to be any user-accessible software

Internally, I expect the detection to be done in software but you’re welcome to come up with a HW solution

* Interfaces (subject to change)

*It needs a stereo mini jack for the headphones*

*It needs a plug or other way to connect to a variety of audio sources.*

*You need to consider the best way(s) to connect to devices (android, apple, pc, etc)*

*Wifi is an option but I don’t think Bluetooth is viable due to audio delay.*

**Deliverables:**

Design documentation, schematic diagrams, printed circuit layout, bill of materials, hardware, software, user’s manual.

**Legal Information:**

Check below if this project involves:

IP Ownership by Sponsor (please contact rlaoulache@umassd.edu)

Non-Disclosure Agreement (please contact rlaoulache@umassd.edu)

**Project Classification:**

Select one of the classifications— Intradisciplinary1 or Interdisciplinary[[1]](#footnote-1):

Intradisciplinary *(select a single discipline)*

Bioengineering

Civil and Environmental Engineering

Computer and Information Science

Computer Engineering

Electrical Engineering

Mechanical Engineering

Physics

Interdisciplinary *(select multiple disciplines)*

Bioengineering

Civil and Environmental Engineering

Computer and Information Science

Computer Engineering

Electrical Engineering

Mechanical Engineering

Physics

**Special Instructions:**

<List specific instructions here.>

*(To be completed in September by the team that undertakes the project)*

Team Number: ­­­­\_\_\_\_\_\_\_\_

#### Student 1: \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*(Project Manager)*

Student 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Student 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_

#### Student 4: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Student 5: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Faculty Advisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_

#### Project Mentor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_

1. Intradisciplinary: working within a single discipline.

   Interdisciplinary: integrating knowledge and methods from different disciplines, using a real synthesis of approaches. [↑](#footnote-ref-1)