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# Project: Helmet for deaf

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Unsatisfied problem/social need:

- A person with hearing difficulties has a disadvantage when driving a vehicle, especially a motorcycle or a bicycle, because he does not hear where other vehicles are coming from.
- Drivers cannot hear well when wearing a helmet.
- Road safety: It is known that there are many traffic accidents related to motorcycles, many of them fatal.
- Helmets are required for motorcycles, trikes, ATVs, and bicycles.

Solution:

A helmet that transforms the sound of vehicles into tactile signals.

- This product gives a driver the ability to know the position of other motor vehicles without the need to see or hear them by using the sense of touch instead.
- In turn, the product promotes road safety.

## Advantages:

- Since helmets are already mandatory for the use of many vehicles, it is an easily accepted product and can even be so discreet that no one will notice that you are wearing a “hearing helmet”.
- Since it is a product that helps people with reduced abilities, the press will speak well of the product and it is very likely that the product will have free publicity.
- If the product becomes accessible, it is likely that the government will force its use, thus the company that manufactures it will have a large market.
- It is a product that can be exported.

## Ideas and considerations for product design:

- The helmet should have several microphones in different positions on the helmet to detect where the sound is coming from.
- These microphones may need to be special and probably require a particular calibration.
- A powerful enough microcontroller is required to analyze each signal heard by the microphones.
- The program and/or the circuit must be able to capture the sound of the engines of the other vehicles and the horns, filtering other sounds and even the sound of the vehicle itself in which the driver is riding.
- The helmet must provide tactile signals to the driver on his scalp.
  - One option is through the use of vibrators such as cell phones. Although it is necessary to analyze if these are not too annoying.

- It must be taken into account that the sound rebounds, therefore the program and/or circuit must take this detail into account in order not to detect false signals.
- A power source is required for the device.
  - A battery may be the solution.

- It must be taken into account that the devices added to the helmet do not cause risks of damage to the head in the event of an accident. However, it is worth remembering that some helmets use Gopro-type cameras.

Product review:

1) The name Helmet for the Deaf is not a very good idea since it stigmatizes and can cause some people not to want to buy them. You have to think of a suitable name. 2) It may be very expensive.  
Other product versions:

Instead of being a helmet, it can be a cap (Pedestrian Safety).

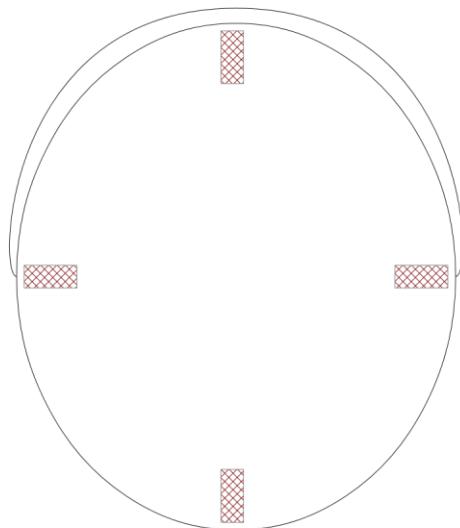
Instead of using tactile signals, the device can be displayed on a screen just like radars do. This is useful for cars.

Microphones could be replaced with radars.

>>The idea of using tactile signals to represent other signals can serve other functions.

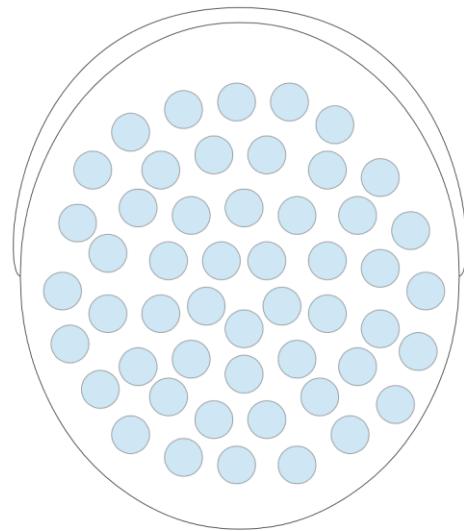
>>It is possible to use the tactile signals in other areas than the head.

#### DESIGN SKETCH 1 WITH VIBRATORS AND MICROPHONES.



Helmet viewed from above with 4 externally located microphones to detect where sounds are coming from.

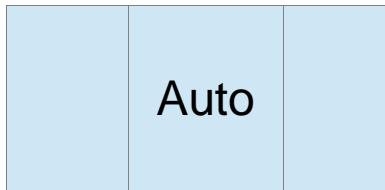
Helmet seen from above.



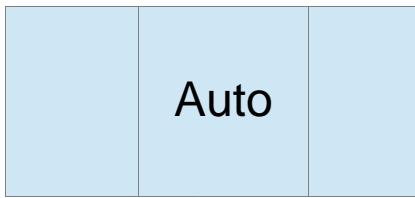
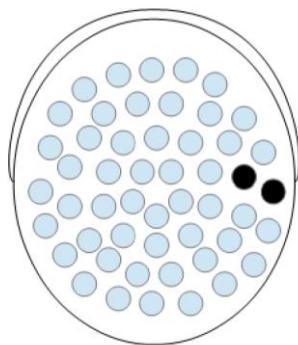
marked..

Here the internal position of the tactile signaling devices (vibrators) that would be in contact with the scalp is

## Example of operation:

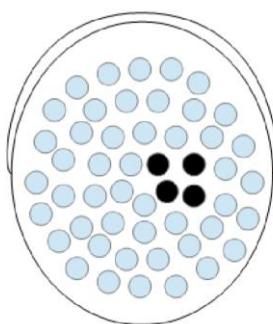


When detecting the engine of a vehicle 20 meters to the right, 2 sensors are activated to the right of the helmet that vibrate with little force.



Since the vehicle is now 5 meters to the right, the activated sensors indicating its position (the vibrators) are the ones that are most in the center (although they are still on the right) and should vibrate the strongest.

This is just one possible way of signaling the position. I have to find out what is the best way..



It works like a radar screen but it is tactile.