

# Interim Report:SCOOBY

## The definition of the problem

Our country has been challenged with an ongoing and escalating issue of mass shootings in schools across the United States, these schools include Virginia Tech (33 killed in 2007), Sandy Hook Elementary (28 killed in 2012), Robb Elementary (22 killed in 2022), University of Texas-Austin (18 killed in 1966), Parkland High (17 killed in 2018), Columbine High (15 killed in 1999), Texas Santa Fe High (10 killed in 2018), Umpqua Community College (10 killed in 2015), Red Lake Senior High (10 killed in 2005), and hundreds of other schools.

According to the Center for Homeland Defense and Security, there have been 2069 school shootings in our country between 1970 and June 2022. The most dangerous year was 2021. There were over 240 non active and active shooter events. The deadliest year was in 2018, when 51 people were killed. Also, about 684 people have already died as a result of this escalating issue in our country.

## Your plan for solving the problem computationally

Steps:

1. Designing a robotic gunshot detection system by drawing schematics and printing circuit board to be used with Raspberry Pi Pico processor.
2. Connecting peripherals such as microphones, LCD display, LED ring, SD drive, Real Time clock.
3. Writing software to control all the parts of the system (in C++)
4. Collecting and analyzing data
5. Writing software to distinguish between balloon pops (which for safety reason we used instead of actual gunshots) and other sounds for future ML model (first in Python then in C++)

## A description of the progress you have made up to this time

The team has successfully managed to develop a few prototypes of the system and have been tested in several different experiments.

### **The results you expect to get**

The team expects to develop a system that accurately identifies a balloon pop and the direction it came from.

### **At least five citations of information you have referenced**

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Hauser, Christine, and Anahad O’connor. “Virginia Tech Shooting Leaves 33 Dead.” *The New York Times*, The New York Times, 16 Apr. 2007,

[www.nytimes.com/2007/04/16/us/16cnd-shooting.html](http://www.nytimes.com/2007/04/16/us/16cnd-shooting.html). Date Accessed: November 14 2023

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[www.history.com/this-day-in-history/gunman-kills-students-and-adults-at-newtown-connecticut-elementary-school](http://www.history.com/this-day-in-history/gunman-kills-students-and-adults-at-newtown-connecticut-elementary-school). Date Accessed: November 14 2023

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