



## Colorado Science and Engineering Fair

## 2024 Individual Project Abstract Form

**Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.**

Title of Project: InvisiEye 2.0: A compact, modernized solution to aid the blind and visually impaired

Finalist's Name: Geo Raguraman

School and City: Discovery Canyon High School, Colorado Springs

Sponsor's Name: Dr. Beaulah Aloysius

Category: Engineering (ENGR)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

Independent mobility is a challenge for people with visual impairment or blindness. Assistive technology for the blind is a field of research that is gaining more and more importance due to the eruption of new interest from different fields. These research findings have had a huge social impact among elderly and blind population. The objective of this project is to aid blind people in a more comfortable way! According to the CDC, "Approximately 12 million people 40 years and over in the United States have vision impairment, including 1 million who are blind, 3 million who have vision impairment after correction, and 8 million who have vision impairment due to uncorrected refractive error". In revision 2.0 of this project, we take all of the weaknesses of InvisiEye 1.0 and turn it into the strengths for this one. This project is compact, modernized, and accurate in detecting objects to aid the blind and visually impaired. The form factor of this project makes it very productionable and very modular, as it can go with any type of clothes and any type of weather. InvisiEye 2.0 features a small backpack to house electronics and a custom pair of sunglasses mounted with a camera. The camera will be running YoloV8 object detection with a dataset trained for common objects indoors and outdoors. The camera will relay its information to a Raspberry Pi which will give auditory feedback such as the object, and the distance to the object at that current time. The user will be able to use this project hassle-free, without the use of a "suit" (like InvisiEye 1.0), or a cane.

*I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.*

Finalist's Signature: *Geo Raguraman*

Date: *02/28/24*

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with your Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.