



Colorado Science and Engineering Fair

2025 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: A Low-Cost, Onboard Animal Detection System to Mitigate Wildlife-Vehicle Collisions

Finalist's Name: Siddhi Singh

School and City: STEM School Highlands Ranch, Highlands Ranch

Sponsor's Name: Tylor Chacon

Category: Environmental Engineering

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Wildlife Vehicle Collisions (WVCs) have become increasingly common globally and continue to pose significant injury risks to both human and animal life. These collisions are not only dangerous, causing thousands of fatalities and injuries nationally, but also lead to costly damage to vehicles and infrastructure. Unfortunately, current solutions for mitigating WVCs (such as fencing, over/underpasses, and stationary road signs) are too expensive and cumbersome to implement everywhere at once. Stationary devices are more challenging to apply in various locations and are more prone to being overlooked by drivers. My proposal for overcoming these limitations is an onboard animal detection system, designed to provide real-time alerts to drivers. This system integrates a thermal camera with a custom artificial-intelligence-based computer vision model to detect and classify animals on the road. When an animal is detected, the system triggers immediate alerts through a visual signal; this enables drivers to respond promptly and pay attention to animals on the road. The scalability of my system makes it a viable option for widespread adoption. While overpasses and fencing can take years and millions of dollars to implement, this device can be quickly installed at a much lower cost. By prioritizing a driver-centric approach, my device aims to prevent collisions at critical moments rather than depending on fixed infrastructure that cannot adapt to changing wildlife patterns or driver behavior.

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:

Date:

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 you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**