



# Transforming a Science Day Investigation to an Ohio STEP Project

The Ohio Academy of  
Science



# What We Will Cover

- ◆ What is The Difference Between Science Day and Ohio STEP?
- ◆ How Many of the Sections of the Innovation Canvas Have You Already Completed With Your Science Day Project?
- ◆ Assessing the Commercial Opportunities of Your Research
- ◆ What Additional Information Do You Need To Complete?
- ◆ Benefits to participating in both!

# What is The Difference Between Science Day and Ohio STEP?

## Science Day

Introduces students to methods and processes used in science and how these approaches are used to discover new knowledge and solve problems.



## Ohio STEP

Introduces students to the intersection of STEM innovation and entrepreneurship and equips students with the mindset, skills, and knowledge to navigate the market landscapes of the entrepreneurial world.



# Commercialization of Scientific Research

**Research:** Observations and experiments during research activities often lead to discoveries and inventions.

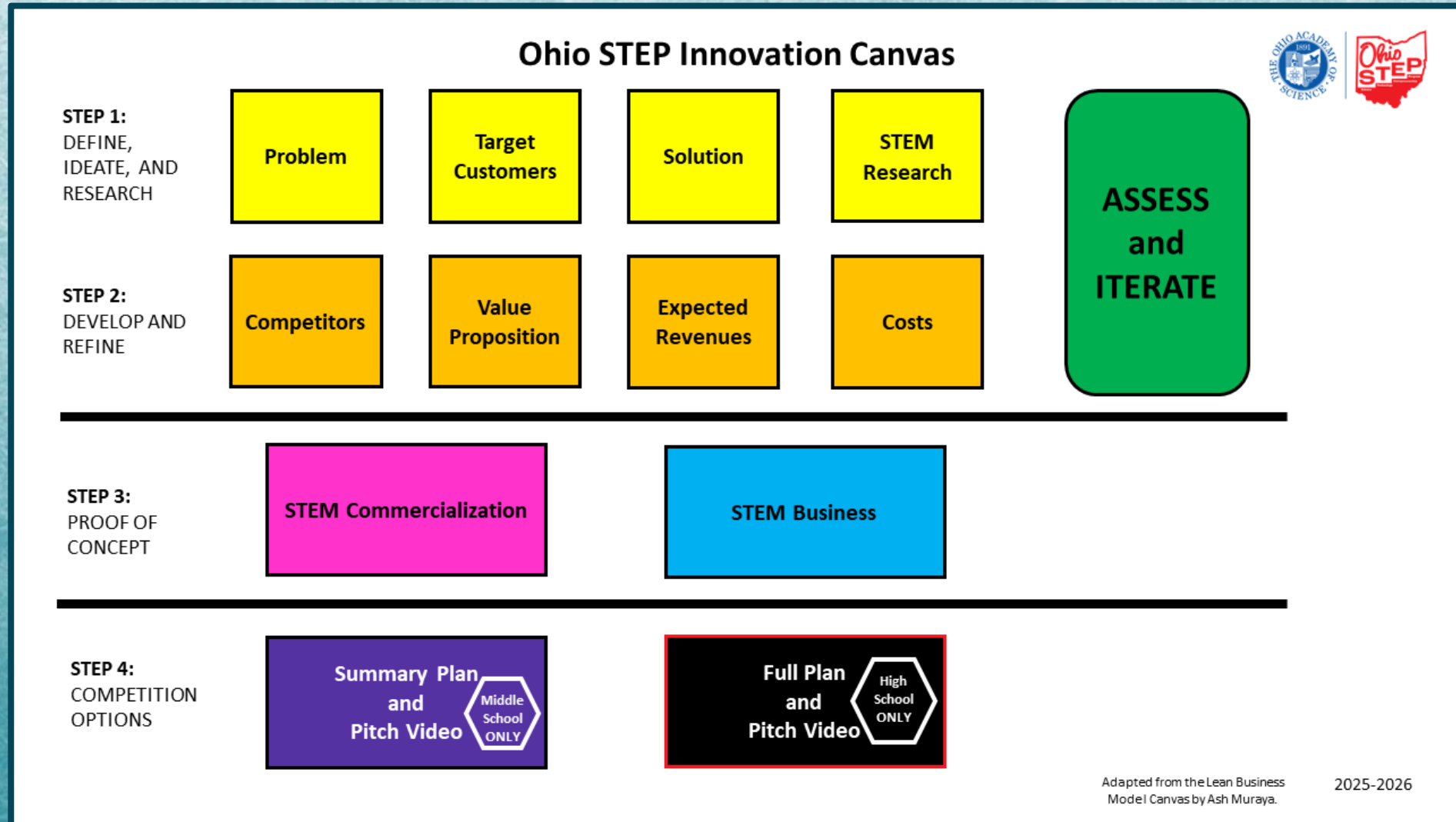
Research commercialization is the process of transforming scientific discoveries and innovations into marketable products, services, or technologies that generate economic value. This involves moving research findings from laboratory settings through development stages to reach end users in commercial markets.

<https://waitro.org/blog/how-do-research-institutes-commercialize-their-discoveries/>





# How Many of the Sections of the Innovation Canvas Have You Completed With Your Science Day Project?



# How Many of the Sections of the Innovation Canvas Have You Already Completed With Your Science Day Project?

## Scientific Method or Meta Analysis:

1. Identified a question or problem
2. Created your hypothesis
3. Conducted background research

## Engineering Design:

1. Identified a problem
2. Developed a solution
3. Conducted background research
4. Designed a prototype





# Assessing the Commercial Opportunities of Your Research

## Scientific Method or Meta Analysis:

- ◆ Review the research and discussion/conclusion sections of your Science Day report.
- ◆ Can you apply your findings to create an innovative product or service?
- ◆ Can you apply them to create an improvement on an existing product or service?

## Engineering Design:

- ◆ Review the research and discussion/conclusion sections of your Science Day report.
- ◆ Have you clearly identified a problem or market opportunity?
- ◆ Have you proposed an innovative solution or an improvement on an existing solution?

STEP 1:  
DEFINE,  
IDEATE, AND  
RESEARCH

Problem

~~Target  
Customers~~

Solution

STEM  
Research

# What Additional Information Do You Need To Complete?

Review each “Ohio STEP Section” and make sure you have addressed any “Action Step” not already included in your Science Day project.

- “Target Customer” Section
- “Solution and STEM Research” Sections
- Focus on STEP 2 of the Innovation Canvas which is the market feasibility section of Ohio STEP.

**STEP 1:**  
DEFINE,  
IDEATE, AND  
RESEARCH

Problem

Target  
Customers

Solution

STEM  
Research

**STEP 2:**  
DEVELOP AND  
REFINE

Competitors

Value  
Proposition

Expected  
Revenues

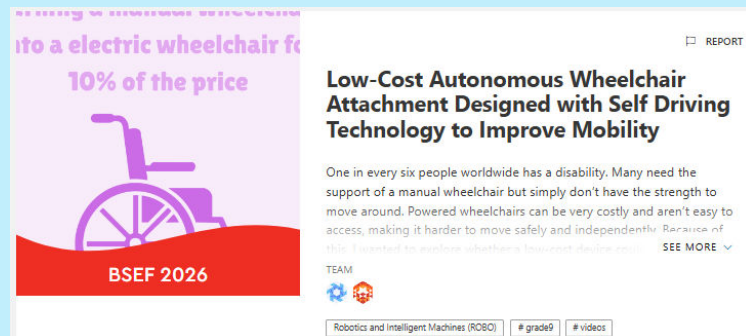
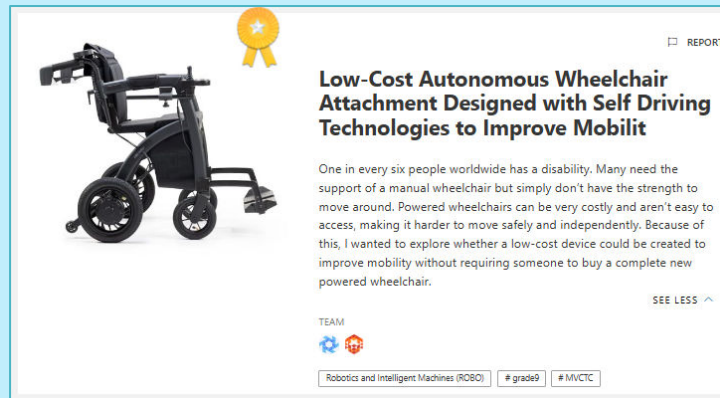
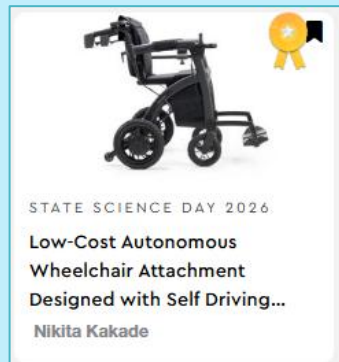
Costs



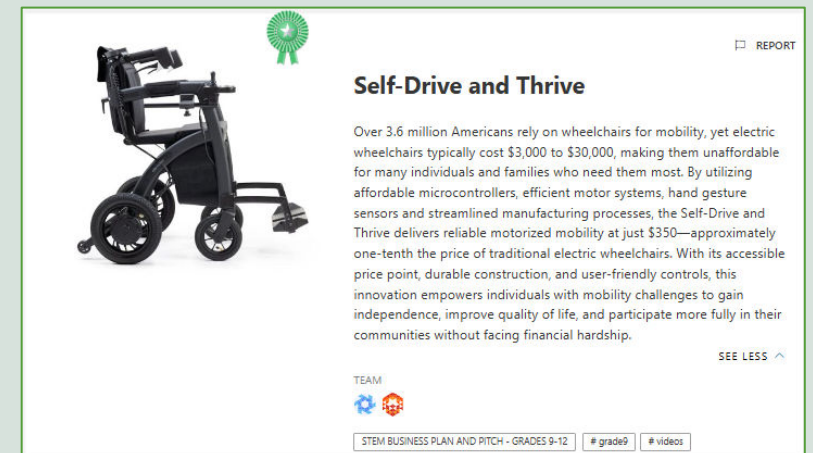
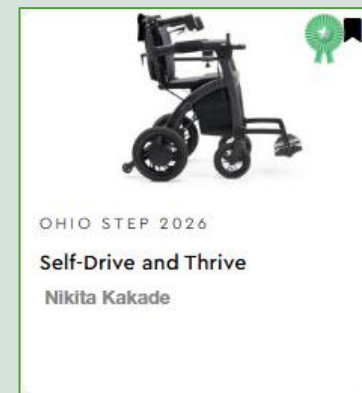
# Examples of Science Day Ohio STEP Projects

Nikita Kakade

## Science Day Engineering Design



## Ohio STEP STEM Business Plan



# Examples of Science Day Ohio STEP Projects

Charlie Pochet

## Science Day Hypothesis Based Project



### Super Sniffer: FAA Compliant Open Drone ID Broadcast Reception, Parsing, and Integration

As indicated by the recent drone scares over several US states, Small Unmanned Air Systems are increasingly common in civil airspace. Detecting and avoiding these potential flight hazards is both important and difficult to achieve, and particularly important at airports without dedicated RADAR or air traffic spotters.

The Super Sniffer addresses the problem of drone location and identification in the United States. The Sniffer will collect drone beacons, required on all drones in US airspace by the Federal Aviation Administration. Super Sniffer currently supports Bluetooth collection and will add Wi-Fi in phase 2. After collection, correlation, and parsing, drone ephemeris will then be transformed for analysis on Geographic Information Systems (GISs). The format selected for GIS injection is XML/ Cursor-on-Target. Cursor-on-Target packets will be transmitted over multicast to local systems or TLS to server relays for display on commercially available GIS tools.

To support both remote embedded and manned operation, system status is displayed both in app and on a local server that accompanies. Remote and local configuration will also be supported. Drone position information will be combined with existing weather updates for broadcast to aircraft landing in small airfields.



Systems Software (SOFT) # grade11 # videos

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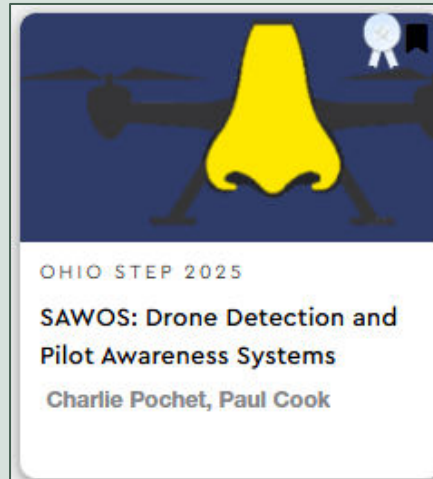
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Charlie Pochet and Paul Cook

## Ohio STEP STEM Commercialization Plan



### SAWOS: Drone Detection and Pilot Awareness Systems

Have you ever flown in a plane? The risk of drone collisions is rising, yet anyone can purchase and fly a drone without training, and the FAA relies on weak regulations for protection. SAWOS extends Automatic Weather Observing System (AWOS) to collect Open Drone ID beacons, providing real-time alerts to pilots—an affordable alternative to costly RADAR. With a \$4.4B drone market and over 5,000 drone-related injuries, SAWOS is the key to the future of aviation safety.



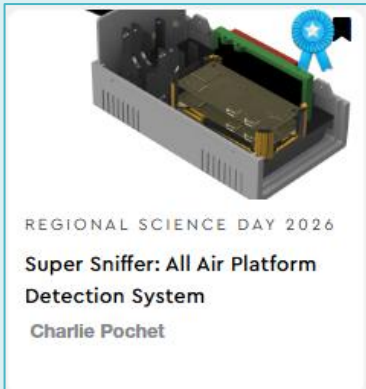
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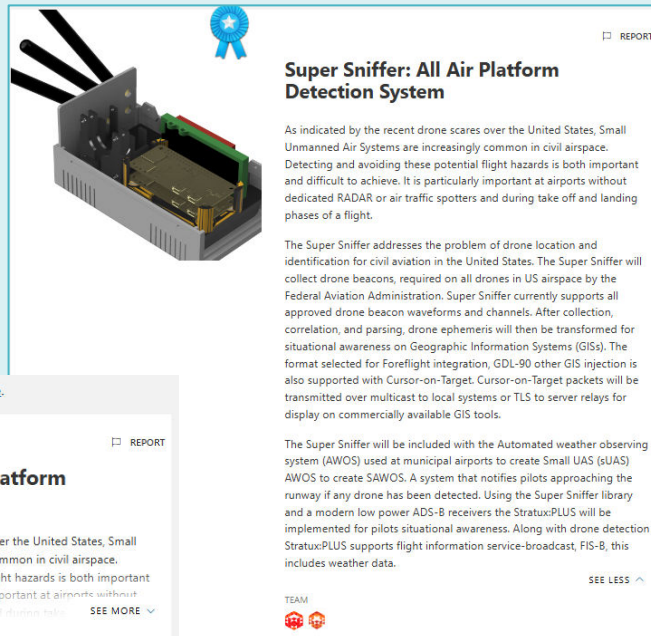
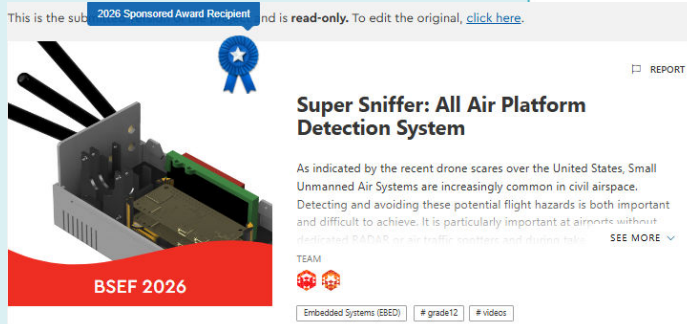
# Examples of Science Day Ohio STEP Projects

Charlie Pochet

## Science Day Hypothesis Based Project

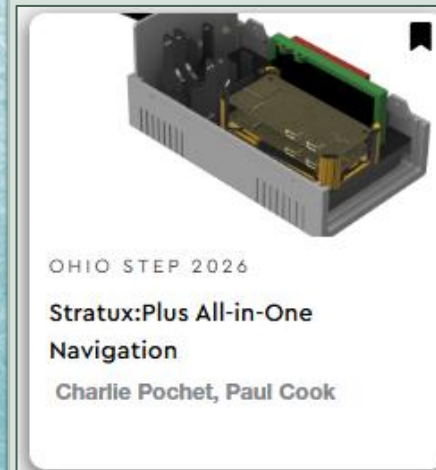


## CONTINUATION PROJECT



Charlie Pochet and Paul Cook

## Ohio STEP STEM Commercialization Plan

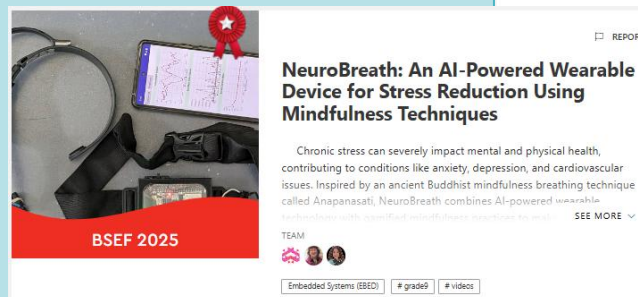
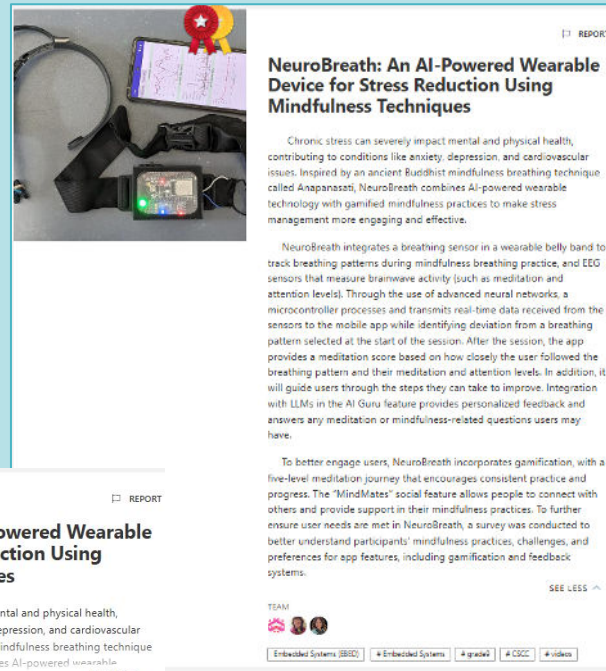
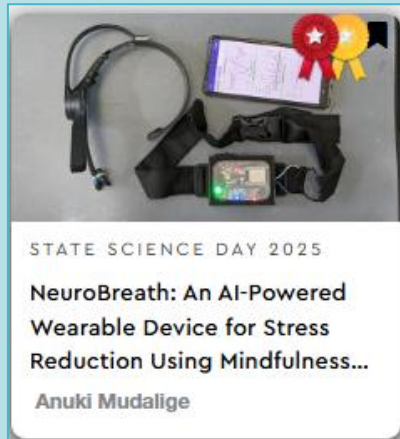




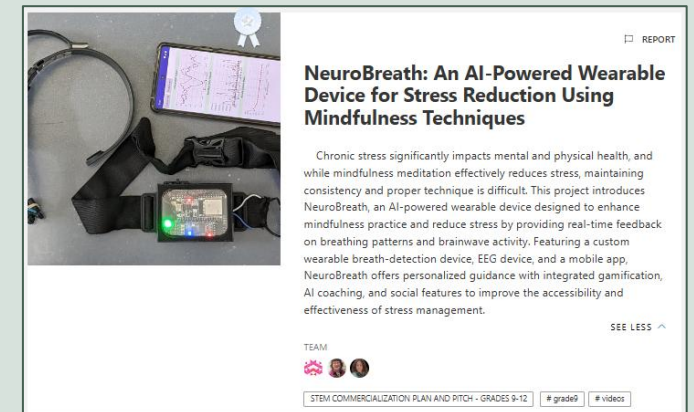
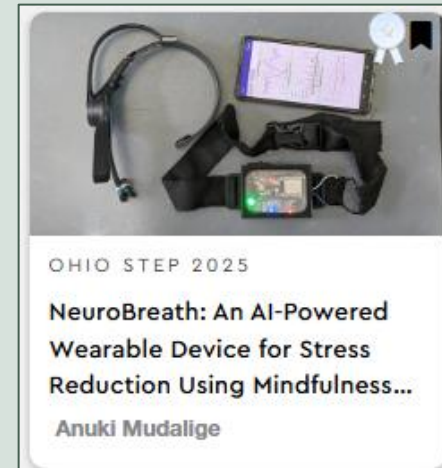
# Examples of Science Day Ohio STEP Projects

Anuki Mudalige

## Science Day Engineering Design



## Ohio STEP STEM Commercialization Plan





# Examples of Science Day Ohio STEP Projects

Anuki Mudalige

## Science Day Engineering Design



STATE SCIENCE DAY 2026

**Sensora: A Wearable AI-Powered Sound Detection and Alert System for Enhanced...**

Anuki Mudalige

REPORT

**Sensora: A Wearable AI-Powered Sound Detection and Alert System for Enhanced Environmental Awareness**

Individuals who are deaf or deafblind face serious safety risks because they cannot perceive critical environmental sounds. Existing assistive technologies are often expensive, stationary, or require internet access, limiting accessibility. Sensora addresses these challenges with a low-cost, wearable device that provides instantaneous sound recognition and visual and haptic alerts. The system uses an ESP32 microcontroller and a microphone to capture environmental sounds, which are processed on-device by a neural network for real-time classification. Comparative testing across multiple microcontrollers identified the ESP32 as the most efficient and cost-effective solution for simultaneous sound capture and on-device inference. Its dual-core architecture enabled a "Producer-Consumer" model, with one core handling high-fidelity audio and the other performing neural network inference. The network was trained on a normalized dataset of numerous sounds and optimized to classify alerts within half a second while using minimal memory. Sensora delivers immediate feedback through an OLED display and a vibration motor, allowing users to recognize sounds via visual icons and distinct vibration patterns. Testing demonstrated consistent real-time detection and reliable interpretation of alerts. The device evolved from a basic volume-threshold system into a compact, wearable device with offline operation, costing under \$25. By providing an affordable and reliable solution, Sensora improves safety and independence for deaf and deafblind individuals. The project demonstrates that real-time sound recognition and multi-sensory feedback can be achieved on budget hardware, offering a practical and scalable approach to improving daily life for individuals with hearing impairments.

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BSEF 2026

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REPORT

## Ohio STEP STEM Commercialization Plan



STATE SCIENCE DAY 2026

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Individuals who are deaf or deafblind face serious safety risks due to their inability to perceive critical environmental sounds, such as fire alarms, doorbells, and baby cries. Current assistive technologies are often expensive, stationary, or dependent on internet connectivity, limiting accessibility and reliability. Sensora addresses these challenges by combining a low-cost, wearable device with real-time sound recognition and multi-sensory feedback. The system uses an ESP32 microcontroller and an I2S microphone to continuously capture environmental sounds, which are then processed by an embedded neural network to classify each sound type without requiring internet access. Sensora delivers immediate feedback through an OLED display and a vibration motor, allowing users to identify the type of sound through visual icons and distinct vibration patterns. This ensures that even users who are deafblind can understand what is happening in their environment. Through multiple design iterations, the device evolved from a basic volume-threshold alert system into a compact, wrist-worn wearable capable of detecting important sounds. This iterative process emphasized affordability, portability, and usability, enabling Sensora to operate fully offline at a cost under \$25. By providing a low-cost, reliable, and fully wearable solution for environmental awareness, Sensora bridges the gap between danger and safety for deaf and deafblind individuals. The project demonstrates that real-time sound recognition and personalized feedback can be achieved on budget hardware, offering a scalable, inclusive, and practical approach to improving safety, independence, and daily life for those who face the greatest auditory challenges.

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# Benefits to participating in both!

## Short Term Benefits:

- ◆ Cash awards and scholarships are available at successive competition levels.
- ◆ These projects provide students with opportunities to explore potential career pathways.

## Long Term Benefits:

- ◆ These programs are positive additions to any application or resume.
- ◆ Scholarships and cash awards can help students meet their post-secondary education goals!

# Questions?

The Ohio Academy of Science

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