

# INSECT-INSPIRED ELECTRONIC-NOSE TECHNOLOGY FOR RELIABLE, ROBUST AND REAL-WORLD CHEMICAL SENSING

[Chakrabartty, Shantanu](#), [Raman, Baranidharan](#), [Singamaneni, Srikanth](#)

[Maland, Brett](#)

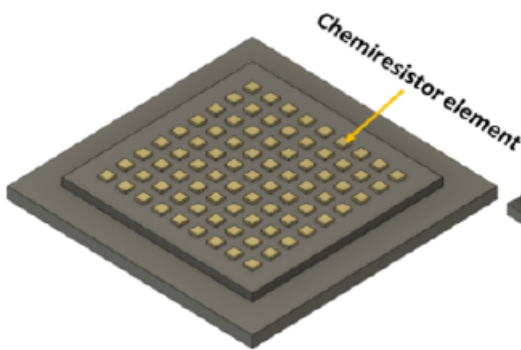
T-020888

Published Date: 2/14/2025

**Value Proposition:** *Portable and deployable platform that uses an AI-enabled, nanoparticle-based e-nose to sense explosive volatile organic compounds.*

## Technology Description

Researchers at Washington University in St. Louis have developed a low-power electronic nose that uses an array of chemiresistors to detect signature patterns for multiple target species. Current chemical sensing technologies use amplifiers to amplify the signal, which requires a lot of power. This technology uses a scalable approach for generating a large chemical sensor array with functionally diverse nanostructured sensing elements that are robust, highly durable, & reproducible, and unlike other systems, can test for multiple chemicals.



**Above figure:** Schematic illustration of the chemiresistor functionalization chamber enabling the controlled delivery of 12 different organothiols to the sensor chip to achieve 9x9 array of distinct chemiresistors

## Stage of Research

Prototype being developed

## Applications

- Sensing explosive volatile organic compounds (funded project) and other dangerous materials
- Medical diagnosis
- Environmental quality monitoring
- Food production

## Key Advantages

- **Can** broadly test for different species in the air
- Reliable and robust chemical sensing
- Signature patterns are unique to different gases
- Electronic nose operates at low power

## Patents

Patent application filed

**Related Web Links** – [Baranidharan Raman Profile](#); [Raman Lab](#)