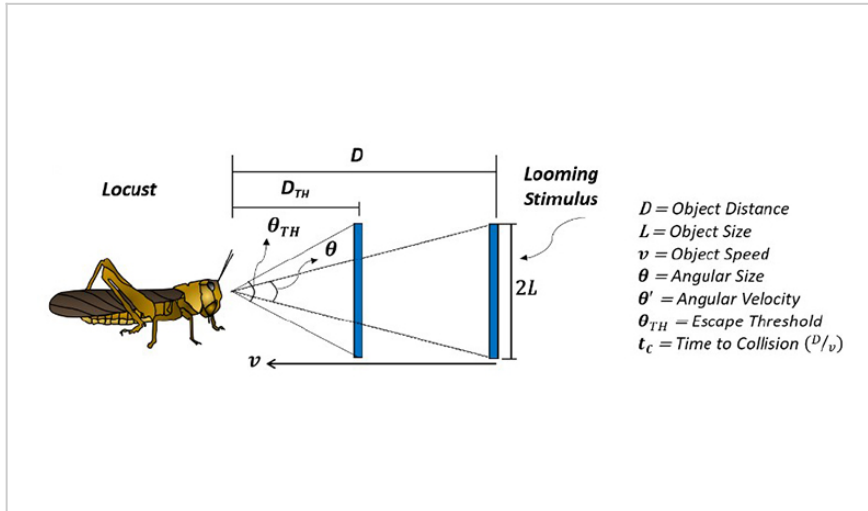


# An Ultra-Low Power Biomimetic Collision Detector

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PennState



LGMD geometric considerations

## Technology Summary

This technology is an ultra-low power collision detector inspired from the collision detection neuron inside a locust called the Lobula Giant Movement Detector (LGMD). The device consists of a monolayer MoS<sub>2</sub> photodetector stacked on top of a non-volatile and programmable floating gate memory architecture, both combined, imitates the escape response of the LGMD neuron, to an approaching object. This is achieved at a frugal energy expenditure of a few nano-joules and at the same time offers orders of magnitude benefit in device footprint.

## Application & Market Utility

Neuromorphic computational devices are able to offer a low cost, low energy alternative to supercomputing by mimicking components of a biological nervous system. By taking inspiration from nature, such technology can enable high-performing functionality at a fraction of the cost (energy, component size/number, computational steps/complexity, etc.) of traditional methods. This type of efficiency will become ever more important as vast numbers of sensors are deployed to any number of devices, including IoT, autonomous vehicles, micro-devices, and defense applications.

## Next Steps

This technology is patent pending. The research team seeks collaboration for further development and licensing opportunities.

TECHNOLOGY READINESS LEVEL

1-3

### Seeking

Investment | Licensing | Research

### Keywords

- Collision Detector
- Biomimetic
- Low Power
- Photodetector
- Programmable Non-volatile Memory

### Researchers

#### Saptarshi Das

Assistant Professor of Engineering Science and Mechanics

[Online Bio](#)

[Website](#)

#### Darsith Jayachandran

Graduate Student

### Originating College

College of Engineering

### Office of Technology Management Contact

Rokita, Joseph

[jjr152@psu.edu](mailto:jjr152@psu.edu)

814-863-6336



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