LICENSING OPPORTUNITY: FLEXIBLE AND PRINTABLE SENSOR THAT USES LIGHT TO DETECT MAGNETIC FIELDS

DESCRIPTION

Problem

Traditional magnetic sensors (Hall, AMR, GMR, TMR, SQUID) are often rigid, power-hungry, expensive to manufacture, not sensitive enough for certain uses, or can't be used in flexible or wearable devices. They struggle to meet the growing demand for flexible, low-cost, and energy-efficient sensors in wearables, IoT, and smart textiles.

Invention

The invention is a new kind of sensor that uses light to measure the strength of magnetic fields. It's built with thin organic light-emitting and detecting layers to create a flexible, printable magnetic sensor that operates at room temperature with high sensitivity and low power consumption. When a magnetic field is present, it changes how the light behaves in the sensor, which helps measure the field's strength. The design is compact, flexible, and can be made at low cost. It's also sensitive enough to detect very small magnetic changes.

BENEFITS

Potential Commercial Applications

For companies creating smart, wearable, or compact sensing devices, this light-based thin film magnetic field sensor offers a more flexible, energy-efficient, and lower-cost alternative to traditional magnetic sensors — with high sensitivity and scalable manufacturing that others can't match.

- Wearables, smart textiles, consumer electronics (e.g., smartwatches, mobile devices)
- Automotive systems, industrial equipment, IoT devices, academic and research labs
- Soft robotics, biomedical patches, foldable/curved sensors

Competitive Advantage

- High sensitivity, flexibility, and printable design, better suited than currently available sensors for wearables and soft electronics, which could reduce packaging and integration costs by up to 30% in flexible applications.
- Organic OLED materials allow for low-cost, flexible production using printing methods, which could potentially reduce manufacturing costs by 20–40%.
- Simpler structure, ambient-condition processing, and lower-cost materials could reduce production time and energy use by ~25% per unit by eliminating cryogenics.

Contact: licensing@nist.gov

NIST TECHNOLOGY PARTNERSHIPS OFFICE

NIST Technology Partnerships Office
National Institute of Standards and Technology
100 Bureau Drive, Gaithersburg, MD 20899-2200