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Machine Learning And Attention For Intelligent Sensing

Tech ID: 33759 / UC Case 2023-724-0

BRIEF DESCRIPTION

A revolutionary approach to sensor data processing that leverages bio-inspired computing for intelligent sensing.

FULL DESCRIPTION

Researchers at UCI have developed a technology introducing a novel framework for intelligent sensing in IoT systems, utilizing Hyperdimensional Computing (HDC) to process sensor data in a robust and lightweight manner. By directly operating on raw analog sensor data, the framework provides real-time feedback for selective sampling and attention mechanisms, significantly reducing data generation rates and enhancing learning quality.

SUGGESTED USES

- » Infrastructure monitoring and management with efficient data processing.
- » Mobile devices with enhanced battery life and processing capabilities.
- » Autonomous systems and robotic systems with advanced sensory perception.
- » Environmental and security monitoring with selective and intelligent data capture.

ADVANTAGES

- » Four orders-of-magnitude data reduction in sensing systems.
- » Real-time feedback for selective data generation and enhanced learning.
- » Robust and lightweight processing through Hyperdimensional Computing.
- » Integration of neural encoding with neural-symbolic reasoning architecture.
- » Hardware acceleration for fast and real-time sensor control.
- » Substantial efficiency, robustness, learnability, and reasoning improvements over current models.

RELATED MATERIALS

- » [Patent Application: Machine learning and attention for intelligent sensing](#)

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OTHER INFORMATION

CATEGORIZED AS

- » **Computer**
 - » Software
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 - » Remote Sensing
 - » Software
- » **Sensors & Instrumentation**
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