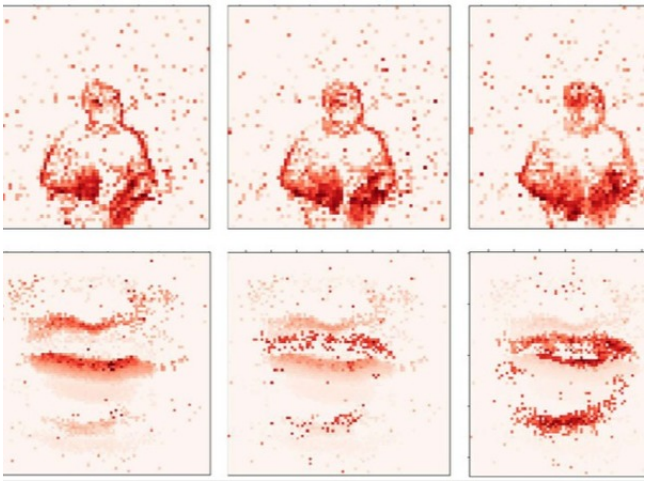
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

RN-Net: Reservoir Nodes-Enabled Neuromorphic Vision Sensing Network

TECHNOLOGY NUMBER: 2023-469



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Category
Hardware
Robotics
Engineering & Physical Sciences
Semiconductor, MEMS, and Electronics

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OVERVIEW

Efficient asynchronous temporal data processing using neural network architecture

- Reduces hardware and training costs for temporally complex datasets
- Autonomous navigation, surveillance, robotics vision systems

BACKGROUND

Event-based cameras capture visual information through time-based spikes, mirroring biological systems. Past efforts have focused on converting these spikes into frames or leveraging complex spiking neural networks, both of which present issues with cost, training difficulty, and efficiency. Existing solutions complicate real-time processing due to significant preprocessing requirements and memory demands. An efficient, cost-effective approach is needed to fully utilize asynchronous, sparse data from event-based cameras for applications like enriched vision in robotics and advanced surveillance systems.

INNOVATION

Researchers at the University of Michigan have developed RN-Net, a neuromorphic vision sensing network utilizing reservoir nodes for low-cost, efficient processing of event-based data.

By employing short-term memory memristors, the architecture inherently processes temporal spikes, achieving exceptional accuracy on advanced datasets without the complexity traditionally associated with such tasks. Applications extend to real-time gesture and motion recognition, where quick, responsive interpretation of complex visual input is paramount, offering a lightweight and cost-efficient solution compared to traditional methods.

ADDITIONAL INFORMATION

REFERENCES

RN-Net: Reservoir Nodes-Enabled Neuromorphic Vision Sensing Network, Sangmnin Yoo, Eric Yeu-Jer Lee, Ziyu Wang, Xinxin Wang, Wei D. Lu, 23 May 2024
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