Event-Based Perceiver for Small or Distant Object Detection

DeepTech

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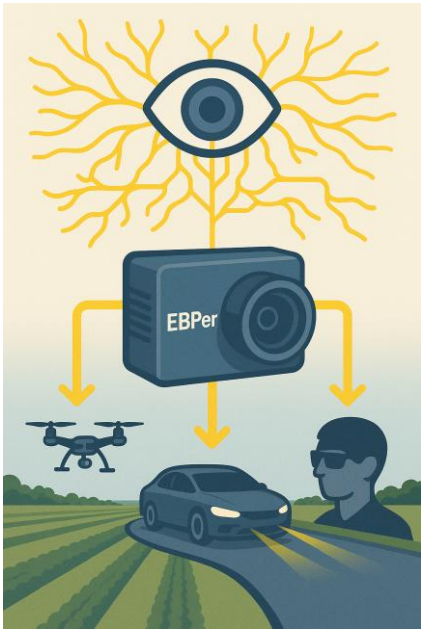
The Event-Based Perceiver (EBPer) is an advanced vision system that enables high-resolution detection of small or distant objects with exceptional energy efficiency. It combines a continuously moving event-based camera with spatiotemporal algorithms that mimic the biological eye, encoding only changes and significantly reducing energy consumption by ignoring static visual information. Its asynchronous processing and EB architecture deliver high accuracy at ultra-low power. EBPer addresses a critical need in modern vision tasks, overcoming the precision–power trade-off where conventional imaging technologies often fall short.



APPLICATIONS

- Low-power pest and disease detection in smart agriculture
- High-resolution, low-power object tracking for micro and nano UAVs
- Long-range detection and identification of UAVs.
- Wearable visual aids for the visually impaired.
- Event detection without personal imagery for privacy-preserving monitoring.
- High resolution, low-power vision for autonomous vehicles and sustainable robotics.

DEVELOPMENT STAGE

The technology was validated using EB datasets of tiny images captured with a bio-inspired camera setup. Results demonstrated the superiority of EB spatiotemporal coding over frame-based (FB) methods in image recognition by artificial neural networks (ANNs).

DIFFERENTIATION

- Enhanced detection capabilities
- Real-time adaption to dynamic environments
- Energy efficiency, ultra-low power operation
- High dynamic range and light sensitivity

REFERENCES

- Assa E. et al., **bioRxiv**