

Event-Based Vision Systems

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Abstracts

Latest AI-driven advancements in computer vision focus on emulating the characteristics of the human eye in a vision sensor system. Also known as a neuromorphic or event-based vision system, or dynamic vision sensor (DVS) camera, the system can potentially transform the computer vision landscape by ensuring reduced latency and lower power consumption for upcoming solutions. Its potential application areas include autonomous vehicles (for lower latency, HDR object detection, and low memory storage needs), robotics, IoT (for low power, always on devices), augmented reality/virtual reality (AR/VR) (low power and low-latency tracking), and other industrial automation use cases.

This report focuses on assessing the challenges involved in the adoption of event-based vision systems, and the solutions and approaches that the active participants are developing for introducing innovative products. The report combines a comprehensive analysis of patent filings, companies active in the space, and R&D activities from universities and research labs across the world, delivering key insights into the maturity and evolution of the technology.

Patent Trend Analysis

Patent filings over the last decade (2010-2019) were analyzed to evaluate the level of participation of various entities in the R&D space. This section details the assignee landscape and key patents in the domain. The different patent filings have been studied to understand the key challenges addressed by the patent publications. Additionally, patent filings related to event-based vision technologies with a focus on automotive applications are described in-depth to highlight the different deployment scenarios spanning the sector.

Competitive Intelligence

The section provides a detailed description of established companies, startups, and research institutes working on event-based cameras. Different parameters, including company overview, technology stack, partnerships, key personnel, future roadmap, and limitations have been considered for a comprehensive competitive profiling.

A key highlight to emerge from this analysis is that several European startups are directly competing against Samsung in the event-based vision technology domain.

Further, a benchmarking matrix of the commercialized and in-pipeline products has also been included for an in-depth analysis.

Companies mentioned in the report

1. Prophesee
2. iniVation
3. Insightness
4. Qelzal
5. MindTrace
6. CelePixel
7. Sunia
8. Australian Institute of Technology
9. Samsung
10. Sony

Key Insights

Event-based vision systems overcome the issue related to redundant information in the traditional frame-based vision systems.

Event-based technology is at the early stages of development and significant research and investments are increasingly focusing on accelerating the development of such systems.

Event-based vision techniques are being explored in the automotive sector for both in-car applications and for scenarios outside the vehicle.

Some early adopters of the technology are focusing on the DVS fabrication processes and on pixel size reduction.

Samsung is amongst the earliest adopters of the DVS technology.

Research laboratories are focusing on emulating the various parameters of DVS to address challenges such as low dynamic range, pixel size, motion blur, and high latency.

Event-based vision systems are finding application in self-driving cars, drones, IoT, robotics, wearable devices, and surveillance.

Key questions addressed in the report:

What is the difference between frame-based vision and event-based vision?

How do event-based vision techniques overcome the limitations of a traditional frame-based vision system?

What are the key challenges faced by the technology, and which are the entities addressing them?

What is the patent filing trend for the technology between the years 2010-2019?

How is event-based vision technology transforming the automotive sector?

What is the competitive scenario for event-based vision technology?

What are the projects and research activities related to the technology?

Which universities and research institutes, active in the domain, should you watch?

What are the different collaborations and investment opportunities for new companies seeking to explore event-based vision technologies?

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