Editorial
Volume 13:5, 2022

Journal of Biosensors & Bioelectronics

ISSN: 2155-6210

Open Access

Devices for Microbially Synthetic Sight and Modulation Technique Image Analysis

Yuehe Lin*

Department of Chemical Engineering, Pacific Northwest National Laboratory, Washington, USA

Introduction

Recent advancements in mobile electronics and machine vision have boosted the demand for sophisticated image collection and processing systems. Traditional image recognition systems, which use a flat image sensor array with a multilens optical system and the Von-Neumann computing architecture to process the acquired image data, have several limitations, including high system-level complexity, bulky module size, high computing load, and low energy efficiency. As a result, improved picture collecting and image data processing systems are required. As a result, bio-inspired imaging and neuromorphic image processing systems have gained a lot of interest.

About the Study

For image data processing, neuromorphic computing systems that can efficiently handle enormous picture data obtained from the imaging equipment have been created. The traditional Von Neumann design, in which the central processor unit and memory unit are separated, is unsuitable for effectively processing huge unstructured picture data. As a result, an unique computer device inspired by the human brain has been constructed. The memristor crossbar array, for example, can do vector multiplications quickly. A neuromorphic device incorporates artificial neural networks in hardware and enables effective parallel processing of visual data with minimal energy consumption. A device that merges the synaptic device and photodetector into a single unit was previously published in a research [1].

Despite recent advances in neuromorphic image data processing device technology, such systems still require additional image sensors to capture picture information. This invariably increases system complexity and necessitates data transmission. As a result, it has been proposed to integrate an image sensor device with a neuromorphic image processing device. The light-responsive synaptic activity of the neuromorphic vision sensor includes short-term plasticity, long-term plasticity, and spike-timing-dependent plasticity. Furthermore, by simulating the human visual system, a neuromorphic vision sensor capable of both pre- and post-processing of image data has been constructed [2].

We cover current breakthroughs in bio-inspired artificial vision and neuromorphic image processing systems aimed at efficient picture recognition. First, we will discuss bioinspired imaging technologies that mirror the structure and functional benefits of real eyes. Second, we will look into artificial synapses, which are inspired by the human brain's picture data processing. Third, we look at the neuromorphic vision sensor, which combines image sensing and neuromorphic image data processing devices into a single unit. Finally, we provide a brief overview of the current status of bio-inspired artificial vision and neuromorphic image processing devices, as well as their future prospects [3].

Unmanned drones, autonomous driving, augmented reality, and virtual reality all rely on modern imaging technologies. There is a need to include additional characteristics into these imaging systems, such as a large field of view, 3D realtime depth sensing capability, and a hyperspectral imaging function. To provide such qualities, typical imaging systems require bulky optics and/or extra complicated components such as multilens optics, numerous cameras, and colour filter arrays. Many systems with innovative designs inspired by fascinating eye structures in nature have been reported to overcome these difficulties [4,5].

Conclusion

The curved image sensor array, in particular, is a stunning result of emulating the natural eye. Imaging systems inspired by chambered eyes, for example, achieved minimal aberration and great resolution, while those inspired by compound eyes obtained limitless depth of focus and a large field of view. Recently, bio-inspired imaging systems with optical, photonic, and mechanical architectures that mimic specific properties and functions of real eyes have been discovered. In the case of chambered eyes, for example, the ball lenses and characteristic mechanical operations of aquatic species, as well as telescopic vision, have been imitated. In the case of compound eyes, the visual system of Xenos peckii for identifying picture depth and increasing sensitivity, as well as various optical filters of mantis shrimp for differentiating two images, are used.

References

1. Zhang, Diming and Qingjun Liu. "Biosensors and bioelectronics on smartphone for portable biochemical detection." *Biosens Bioelectron* 75 (2016): 273-284.
2. Preble, John F. "Towards a comprehensive system of strategic control." *J Manag Stud* 29 (1992): 391-408.
3. Wood, Keith V and Monika G. Gruber. "Transduction in microbial biosensors using muliplexed bioluminescence." *Biosens Bioelectron* 11 (1996): 207-214.
4. Willis, Rachelle M., Rodney A. Stewart, Kriengsak Panuwatwanich, and Sarah Jones, et al. "Alarming visual display monitors affecting shower end use water and energy conservation in Australian residential households." *Resour Conserv Recycl* 54 (2010): 1117-1127.
5. D'souza, S. F. "Microbial biosensors." *Biosens Bioelectron* 16 (2001): 337-353.

***Address for Correspondence:** Yuehe Lin, Department of Chemical Engineering, Pacific Northwest National Laboratory, Washington, USA, E-mail: yuehel332@gmail.com*

Date of Submission: 19 April, 2022, Manuscript No. jbsbe- jbsbe-22-73156; **Editor Assigned:** 21 April, 2022, PreQC No. P-73156; **Reviewed:** 26 April, 2022, QC No. Q-73156; **Revised:** 04 May, 2022; Manuscript No R-73156; **Published:** 09 May, 2022, DOI: 10.37421/2155-6210.2022.13.334

How to cite this article: Lin, Yuehe. "Devices for Microbially Synthetic Sight and Modulation Technique Image Analysis." J Biosens Bioelectron 13 (2022): 334.