

Optoelectronic Fusion Intelligent Authentication



Overview

Such signals contain unique identifiable information that can help in biometric authentication. The present application relates to an optoelectronic fusion reconfigurable analog intelligent computing system and a task learning method therefor. The system comprises: an optical analog computing module and an electrical analog computing module, wherein the optical analog computing module is used. Integrating microelectronics and optoelectronics can harness the mature processes and functions of microelectronics, with the ultra-wideband and low-power benefits of optoelectronics. We conducted a user study using a PPG and. Herein, we present a chaos-based Physical unclonable function (PUF) security system using chaotic vertical-cavity surface-emitting lasers (VCSELs) as key generation sources, achieving ultrafast response rates (>300 Gbps) and exceptional energy consumption below 1 pJ/bit per emitter.



Article Content

Homogeneous integration of two-dimensional material-based ...

Integrating volatile optical sensing with non-volatile memory is crucial for neuromorphic vision applications. Wang et al. propose a homogeneous integration scheme that combines

Intelligent Soft Robotic System for Sensing and Recognition via ...

Persistent challenges include inadequate system flexibility, a limited dataset for recognition, and less-than-optimal recognition accuracy. Herein, an intelligent soft robotic system

Optoelectronic Fused Computing in Multi-functional Integrated ...

In order to better apply the optoelectronic fused computing platform in the multi-function integrated technology, the research status of the optoelectronic fused computing platform are reviewed.

(PDF) Multiuser computational imaging encryption and

We propose a multi-image SPI encryption method and combine it with orthogonal frequency division multiplexing-assisted key management, to

A multi-feature fusion approach for physical layer authentication in ...

In this case, the lightweight physical layer authentication (PLA) mechanism utilizes the inherent distinctiveness and unpredictable nature of channel physical properties, serving as a vital

Solution-Processed Optoelectronic Fusion-Upconversion Devices for ...

Request PDF | On Mar 3, 2026, Zhoudao Wang and others published Solution-Processed Optoelectronic Fusion-Upconversion Devices for Intelligent Perception and Communication | Find,

Reliable human authentication using AI-based multibiometric image ...

The combination of multiple biometric dependability of human authentication and recognition systems which is referred to as multibiometric image sensor fusion, and it is an advanced

Micromachines | Special Issue : Optoelectronic Fusion

It will allow for the multi-functional integration of communications, sensing, and computing chips, as well as optoelectronic intelligent chips, promoting

Chaos-based scalable optoelectronic physical unclonable functions

Our solution establishes a robust foundation for scalable, low-latency key distribution and dynamic authentication, addressing the evolving security demands of modern user-intensive/device-dense

A Multi-fusion IoT Authentication System Based on Internal Deep Fusion ...

From the discussion in the literature study, we observe that the deep fusion techniques have not been fully leveraged for a robust ECG authentication system. To this end, we have

Integrated Photonics and Electronics for Optical Transceivers ...

The recent proliferation of artificial intelligence and machine learning applications relying on large language models is fueling unprecedented demand for compute capacity. Associated with this is a

Fusion-Id: A Photoplethysmography and Motion Sensor Fusion

Such signals contain unique identifiable information that can help in biometric authentication. In this work, we propose Fusion-ID, which use wrist-worn PPG sensors fused with motion sensor data as a

Applying Optoelectronic Devices Fusion in Machine

Machine vision is supported and enhanced by optoelectronic devices, the output from a machine vision system is information about the content of the

Empowering robust biometric authentication: The fusion of deep

The study adds to security development by integrating novel biometric identification and authentication approaches with cutting-edge neural network technology. In this research, we provide

Security Analysis of Multimodal Fusion Authentication Technology in ...

This paper proposes a multimodal data fusion authentication model based on deep learning, aiming to improve the security and authentication accuracy in the remote management of power systems. By

Multi-biometric fusion for enhanced human authentication in

Multi-biometric fusion techniques have been created in response to these difficulties in order to get around the constraints of individual biometric features. The authentication method

All-silicon multidimensionally-encoded optical physical unclonable ...

We finally demonstrate the implementation of efficient lightweight mutual authentication protocols for IoT applications by using the all-Si multidimensionally-encoded optical PUFs.

Optimal feature level fusion for secured human authentication in ...

In this paper, we introduce a new technique to perform fusion at the feature level by optimal feature level fusion; here the relevant features are selected using an optimization technique.

Optoelectronic intelligence | Applied Physics Letters

Optoelectronic integration may be most straightforward when combining superconducting circuits with silicon light sources operating at liquid

Summary of Data Fusion and Enhancement Methods for Optoelectronic ...

Aiming at the problems of single spectral image reconnaissance data in complex environments, such as inability to work around the clock, poor anti-interference ability, and low detail recognition of important

Optoelectronic Computing-LImIT Tsinghua University

Optoelectronic Computing Computing power is an important support for the development of artificial intelligence (AI). With the saturation of the Moore's law, the development of emerging intelligent

Optoelectronic fusion reconfigurable analog intelligent computing ...

The present application relates to an optoelectronic fusion reconfigurable analog intelligent computing system and a task learning method therefor.

Applying Optoelectronic Devices Fusion in Machine Vision: Spatial ...

This chapter presents the application of optoelectronic devices fusion as the base for those systems with non-linear behavior supported by artificial intelligence techniques, which require the use of

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