Syropy AI Connectivity

High-precision optical binning for edge computing

Overview

An adaptive optical power control and a shifted bins binning of the histogram (SBbH) method to achieve high-precision distance measurement both at short-range and long-range. Abstract: We experimentally realize photonic edge computing over an 86-km fiber link with 3 THz optical bandwidth and demonstrate DNN inference at 98. Machine learning is ubiquitous in cloud computing and data centers, but recently. Abstract—This paper demonstrates a ranging sensor system with a configurable array of 16 × 16 single photon avalanche diodes (SPADs), a 940nm vertical cavity surface-emitting laser (VCSEL), a co-design VCSEL driver with tunable widths from 400ps to 3630ps full-width at half-maximum (FWHM) optical. GENIO enhances central offices with computational and storage resources, enabling telecom operators to leverage their existing PON networks as a distributed edge. The proposed system combines distributed IoT sensors, blockchain-based secure data transmission, and neuromorphic.

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Optical Computing for Deep Neural Network Acceleration:

Optical computing typically has high power overheads which makes it challenging to accelerate DNN execution with an optical substrate. In this section we present some promising solutions to adapting

"A Fully Integrated dToF System-on-Chip with High Precision

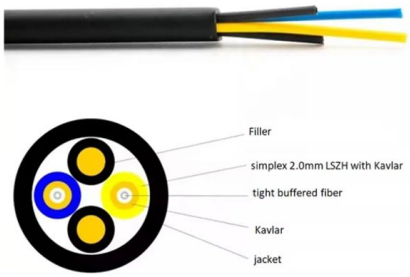
Bibliographic details on A Fully Integrated dToF System-on-Chip with High Precision Using Adaptive Optical Power Control and Shifted Histogram-Bin Binning.

Accuracy and Precision of Edge-Based Modulation Transfer Function

This paper provides simulation results on the accuracy and precision of edge-based methods over the whole edge angle range with various binning phases and oversampling ratios.

Photonic chip integrates sensing and computing for

Photonic chip integrates sensing and computing for ultrafast machine vision Technology eliminates optical-electronic conversions, holds promise for



GENIO: Synergizing Edge Computing with Optical Network

Abstract Edge computing has emerged as a paradigm to bring low-latency and bandwidth-intensive applications close to end-users. However, edge computing platforms still face

GENIO: Synergizing Edge Computing with Optical Network

Through simulations, we show the feasibility of GENIO in supporting real-world edge scenarios, and its better performance compared to a traditional edge computing architecture.

High-clockrate free-space optical in-memory computing

We demonstrated high-speed VCSEL in-memory neural networks that deliver billion optical convolutions per second for massively parallel edge intelligence at ultralow energy and latency.

$$B_ {text {width}}$$ Adaptive Binning Edge Computing

This paper presents an innovative AI-enabled edge computing framework that integrates healthcare monitoring and energy management in smart cities through adaptive binning techniques.

A Fully Integrated dToF System-on-Chip with High Precision Using

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GENIO: Synergizing Edge Computing with Optical Network

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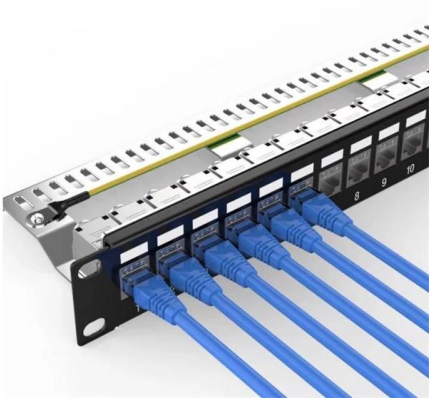
Optimized methodologies lead to high-precision LED color binning

Binning is a costly and time-consuming but necessary burden for LED manufacturers. Let's consider a binning methodology that can lead to optimal classification. Indeed, the necessary quality for LEDs

(PDF) All-digital optical computing paradigm with ultra-high

Here, we propose an all-digital optical neural network (ADONN) architecture that employs digital binary signals at the optical input of the computation core, with entirely logical signal



WDM-Enabled Photonic Edge Computing

Abstract: We experimentally realize photonic edge computing over an 86-km fiber link with 3 THz optical bandwidth and demonstrate DNN inference at 98.8% accuracy with optical energy consumption

Signal-to-noise analysis of point target detection using image pixel

Our study presents a high-precision simulation model of point target detection along with a broad database to evaluate the effect of image pixel binning on the imaging SNR.

Jiqing Xu

Hengwei Yu, Shenglong Zhuo, Yifan Wu, Long Wang, Jiqing Xu, Jier Wang, Zhihong Lin, Patrick Yin Chiang: A Fully Integrated dToF System-on-Chip with High Precision Using Adaptive Optical

Shanghai Institute of Optics and Fine

Mechanics

Researchers have proposed a novel architecture, called the Optical Multi-Imaging-casting architecture (OMica), for high-precision, large-scale

Precision measurement method based on optimized combination of

To overcome these defects, this paper proposes a precision vision measurement method which is based on the optimized combination of pixelbinning cameras. This method transforms the traditional area

Edge computing with optical neural networks via WDM weight

We introduce an optical neural-network architecture for edge computing that takes advantage of wavelength multiplexing, high-bandwidth modulation, and integration detection. Our

Unlocking the potential of edge computing for hyperspectral image

In the present work, we propose a hybrid technique to make the classification of Hyperspectral Images feasible and effective through a Convolutional Neural Network on low-power

Analog optical edge detection by spatial high-pass filtering using

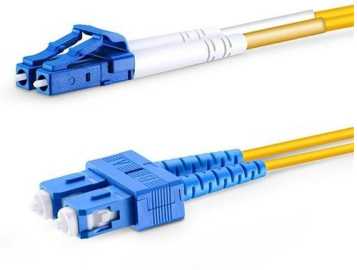
In the following, by exploiting the formalism developed in the previous section, we design and analyze two optical structures for implementing 1D and 2D spatial high-pass filtering to perform

Analog Optical Computing for Artificial Intelligence

Optical computing provides a distinctive perspective to address this bottleneck by harnessing the unique properties of photons including broad bandwidth, low latency, and high energy

Optimal binning of X-ray spectra and response matrix design

Secondly, the finest binning is needed near features with large numbers of counts, for instance the strong spectral lines of Capella. One might therefore adjust the binning according to the properties of



Improving Edge Computing with Coherent Optical

At EFFECT Photonics, we believe that coherent pluggables with an optical System-on-Chip (SoC) can become vital in addressing these datacom and

Edge computing with optical neural networks via WDM weight

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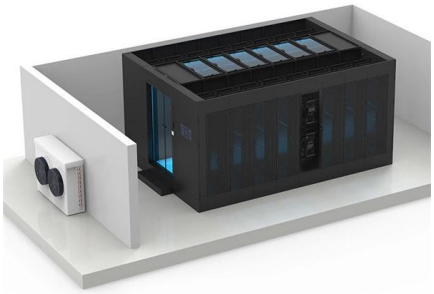
Photonic edge intelligence chip for multi-modal sensing

Edge devices require real-time processing of high-throughput analog signals. Here, authors present a photonic intelligence chip that fuses multiple analog signal types into optical

NeuFlow v2: High-Efficiency Optical Flow Estimation on Edge Devices

Abstract Real-time high-accuracy optical flow estimation is crucial for various real-world applications. While recent learning-based optical flow methods have achieved high accuracy, they



A photosensor employing data-driven binning for ultrafast image

Pixel binning is a technique, widely used in optical image acquisition and spectroscopy, in which adjacent detector elements of an image sensor are combined into larger pixels. This reduces the

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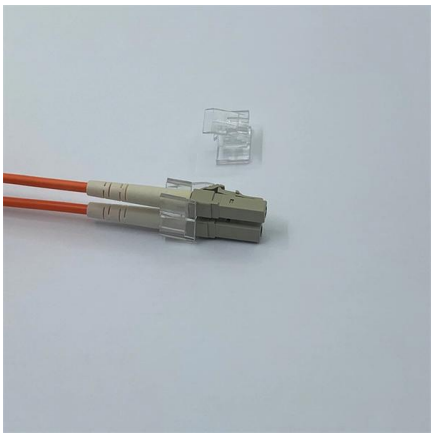

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