Syropy AI Connectivity

Energy-efficient Raman amplifier for edge computing

Overview

The RAMAN accelerator is designed to leverage data and weight sparsity to deploy deep neural networks at the edge, ensuring low power consumption, minimal storage requirements, and reduced processing latency. To introduce novel solutions that can be viable for extreme edge cases, hybrid solutions combining conventional. Abstract—The shift from centralized cloud to edge comput-ing demands hardware systems with data processing capability at ultra-low power. Researchers at the Department of Electronic Systems Engineering, IISc, led by Chetan Singh Thakur, have developed an AI co-processor called RAMAN, or Re-configurable And sparse tinyML Accelerator for infereNce. This paper introduces the Modified Dadda Approximate Multiplier (MDAM), an innovative architecture that optimizes hardware economy.

Energy-efficient Raman amplifier for edge computing

A RRAM-based FPGA for energy-efficient edge computing

However, breaking through the energy wall of FPGAs is a challenge, as low-power operation often requires compromising performances. In this paper, we study a low-power high

Deep Reinforcement Learning for Energy-efficient Selection of

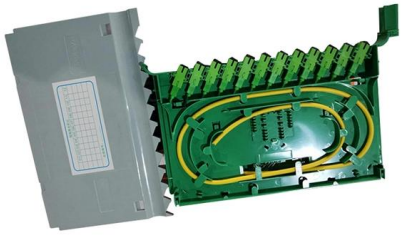
Edge computing helps to release the tension at the center of IoT systems' networks, thus reducing the latency, optimizing the bandwidth, and providing new privacy and security solutions, among others.

Energy Efficiency Maximization in RISs-Assisted UAVs-Based Edge

In this paper, we consider the RISs-assisted multi-UAVs collaborative edge Computing Network (RUCN) in urban environment, in which we study the computational offloading problem. Our goal is to

Performance optimization of different Raman amplifier configurations

To achieve maximum gain with small ripple, pump powers are selected using multiparameter optimization algorithm. The paper is organized in five sections.



Sustainable Energy-Efficient Multi-Objective Task Processing Based

As smart cities evolve, rising computational demands strain infrastructures. Offloading tasks to edge cloud data centers offers potential but faces challenges like high latency, energy use, and data

Energy-Efficient Edge Computing Architectures for AI Workloads: A

In the landscape of cloud-driven environments, the convergence of artificial intelligence (AI) workloads with edge computing architectures holds promise for optimizing computational efficiency and

Energy-Efficient Edge Detection using Approximate Ramanujan Sums

This paper proposes for the first time an approximate computing based energy-efficient hardware accelerator using Ramanujan Sums for edge detection applications

A RRAM-based FPGA for Energy-efficient

Edge Computing

In this work, we propose NEON, a novel compiler optimization to enable the end-to-end execution of the NN workload in RRAM. The key idea of NEON is to transform each non-MAC

Energy-Efficient Approximate Edge Inference Systems

Approximate computing (a design paradigm that trades off a small degradation in application quality for disproportionate energy savings) is a promising technique

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while using a fraction of the power of conventional ML solutions. In this work, we are proposing a hybrid software-hardware edge classifier aimed at the extreme edge near-sensor systems. The classifier

Advantages to a diverging Raman amplifier

Plasma Raman amplifiers have been proposed as a mean to increase laser intensity beyond what is currently possible with solid state devices. The

Energy-Efficient Optimization for Mobile Edge Computing With

We investigate the joint optimization problem of stochastic computation offloading, content caching strategy, and dynamic resource allocation to maximize the energy efficiency of mobile edge

Towards Energy-Efficient Intelligent Edge Computing

This research focuses on energy-efficient edge computing in the context of intelligent edge computing. With the increasing demand for computation and data processing at edge network nodes, the study

RAMAN: An AI Co-Processor for Edge Computing

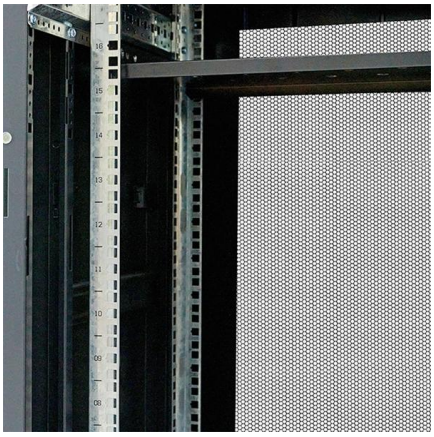
The RAMAN accelerator is designed to leverage data and weight sparsity to deploy deep neural networks at the edge, ensuring low power consumption, minimal storage requirements, and reduced

Tunable Energy-Efficient Approximate Circuits for Self-Powered AI

Approximate computing has emerged as a promising paradigm for error-tolerant AI/ML applications deployed on energy-constrained edge devices where the complexity of hardware computing units

Edge AI for Energy-Efficient Computing: A Systematic Review of

Background and Purpose: Edge Artificial Intelligence (AI) has emerged as a crucial solution for minimizing power consumption during real-time data processing in computing devices.

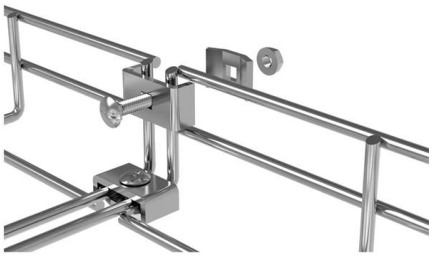


Optimized design of Raman fiber amplifier based on improving

An efficient method to design the broadband gain-flattened Raman fiber amplifier (RFA) with multiple pumps is proposed based on a Extreme learning machine optimized by the salp swarm

Optimizing Energy Efficient Cloud Architectures for Edge Computing:

Moreover, lowering cloud-edge systems' energy footprints is essential for fostering sustainability in light of growing concerns about environmental effects. This research presents a comprehensive review of

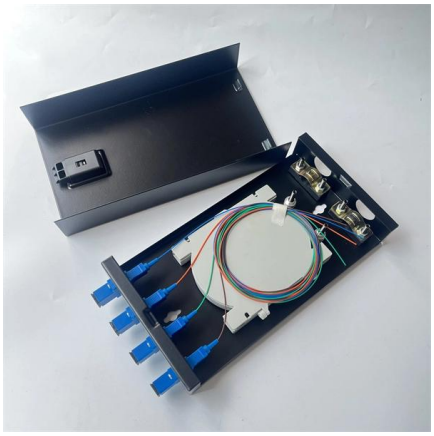


An energy-efficient optimal convolutional neural network for edge

Both 8-bit and 16-bit versions of existing approximate multipliers (AMs) were implemented in Verilog and synthesized using MATLAB, Xilinx Vivado, and Cadence RTL Compiler

Neuromorphic Computing and AI for Energy-Efficient and

Neuromorphic computing, inspired by the brain's efficiency, offers a transformative solution by enabling parallel, adaptive learning with ultra-low power consumption, making it ideal for



A RRAM-based FPGA for Energy-efficient Edge Computing

Reconfigurable systems such as Field-Programmable Gate Arrays (FPGAs) have been a ubiquitous media in many edge computing systems, thanks to their flexibility in hardware implementation.

Optimizing Energy Efficiency in Edge-Computing Environments with

Abstract: The present research investigates optimizing energy-efficient computing environments through dynamic resource allocation in edge computing settings. The primary objective is to enhance system

Energy aware edge computing: A survey

In order to achieve energy efficiency in edge computing, a systematic review on energy efficiency of edge devices, edge servers, and cloud data centers is required.

A Holistic Study of Power Consumption and Energy Savings

The power consumption of a 5G base station using massive MIMO is dominated by the power consumption of the radio units whose power amplifier(s) consume most of the energy, thus

An Energy-Efficient Hybrid SRAM-Based In-Memory Computing

The von Neumann computing architecture faces considerable challenges (e.g., high throughput and improving energy efficiency) in developing artificial intelligence (AI) edge devices. In

Energy Efficiency Maximization in Mobile Edge Computing Networks

In this paper, we investigate the energy efficiency maximization for mobile edge computing (MEC) in intelligent reflecting surface (IRS) assisted unmanned aerial vehicle (UAV) communications. In

Secure and Energy-Efficient Edge Computing Platform with

F. Discussion In this paper, we introduce the lightweight, secure, and energy-efficient edge computing platform architecture. This architecture addresses edge computing platforms' security and energy

Deep Reinforcement Learning for Energy-Efficient on the

This research proposed an energy-efficient framework for edge AI hardware platforms that balances performance and power consumption through the use of a deep reinforcement learning

Optimizing energy and latency in edge computing through a

Abstract This paper presents a new approach based on Boltzmann Distribution and Bayesian Optimization to solve the energy-efficient resource allocation in edge computing.

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