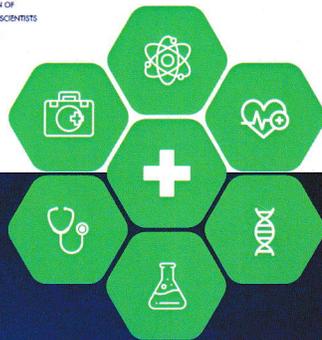


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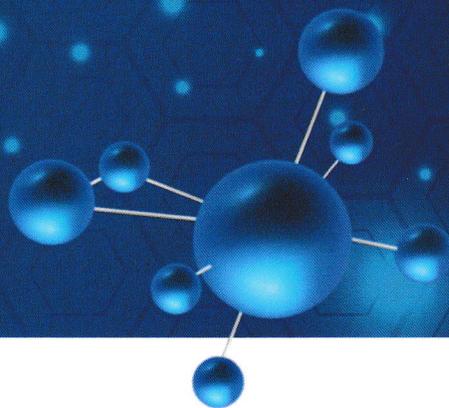


ABSTRACT BOOK

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(7192) AI Accelerator Based on Uniformly Segmented Linear Regression for Real-Time Diagnostics and Wearable Health Monitoring Systems

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Abstract

Introduction: AI inference in healthcare often runs on edge devices with limited computational resources, where efficient arithmetic operations are critical. Traditional multiplication and division in digital signal processing (DSP) can be performance bottlenecks. The logarithmic number system (LNS) addresses this challenge by replacing multiplication/division with addition/subtraction, thus reducing computational load. However, existing LNS approaches often compromise accuracy, limiting their use in high-precision medical applications.

Methodology: This paper proposes a high-precision method for computing binary logarithms and antilogarithms using uniformly segmented linear regression, tailored for accelerating AI inference in healthcare applications. The input is decomposed into integer and fractional parts. The fractional domain is uniformly segmented based on a fixed number of its most significant bits (MSBs), and each segment is modeled using linear regression functions for logarithmic and antilogarithmic computations.

Results: Compared to benchmark LNS approximation techniques, the proposed method achieves higher accuracy, demonstrating its suitability as a core component in AI accelerators for real-time diagnostics and wearable health monitoring systems.

Conclusion and Discussion: The proposed method provides an efficient and accurate solution for accelerating AI inference on constrained healthcare devices. By leveraging linear regression with high precision, it enables real-time inference where speed and reliability are critical. Future work includes extending the segmentation and integration into various medical imaging and patient monitoring applications.

(7340) Prediction of non-alcoholic anthropometric and paraclinical indicators in the Vietnamese population

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Abstract

Non-alcoholic fatty liver disease (NAFLD) is a global health concern. The prevalence of NAFLD is increasing. NAFLD can progress to non-alcoholic steatohepatitis (NASH), which can lead to cirrhosis and hepatocellular carcinoma (HCC) if not diagnosed and treated. The prevalence of NAFLD is increasing, especially in the Vietnamese population. Diagnosis of NAFLD is often based on liver biopsy. Liver biopsy is the gold standard for diagnosis. However, it is an invasive procedure.