Proceedings: CITRENZ 2023 Conference
Auckland, 27–29 September

The Challenges of TinyML Implementation: A Literature Review

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https://doi.org/10.34074/proc.240120

Abstract

This study aims to sensitise and summarise the tiny machine learning (TinyML) implementation literature. TinyML is a subset of machine learning (ML) that focuses on implementing ML models on resource-constrained devices such as microcontrollers, embedded systems, and internet of things (IoT) devices. A systematic literature review is performed on the works published in this field in the last decade. The key focus of this article is to understand the critical challenges faced by this emerging technology. We present five significant challenges of TinyML, namely, limited and dynamic resources, heterogeneity, network management, security and privacy, and model design. This article will be of interest to researchers and practitioners who are interested in the fields of ML, IoT and edge computing.

Keywords: TinyML, edge computing, machine learning, IoT, microcontrollers

This publication may be cited as:

Adlakha, R., & Kabbar, E. (2024). The Challenges of TinyML Implementation: A Literature Review. In H. Sharifzadeh (Ed.), *Proceedings: CITRENZ 2023 Conference, Auckland, 27–29 September* (pp. 160–169). ePress, Unitec. https://doi.org/10.34074/proc.240120

An ePress publication

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ISBN: 978-1-99-118344-6