DESIGN OF AN INTELLIGENT CRYPTO CURRENCY MINING FARM (CMF) FOR VEHICLE USING ML

Dr. Adusumalli Veera Prathap Kumar,Professor

*Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)*
Hyderabad, India

Dr.Ayesha Firdous

Assoc.Professor
*Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)*
Hyderabad, India

J.Shiva shankar

Assoc.professor
*Department of Electronics & Communication Engineering
AVN Institute of Engineering and Technology (AVNIET)*
Hyderabad, India

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Abstract—The rising adoption of electric vehicles (EVs) and advancements in edge computing open new opportunities for leveraging idle vehicle computational resources. This paper presents the design of an Intelligent Cryptocurrency Mining Farm (CMF) for Vehicles, integrated with Machine Learning (ML) to optimize mining efficiency, resource allocation, and energy management. The proposed system utilizes on-board vehicle computing units powered by renewable energy sources to mine cryptocurrency during idle periods. Machine learning algorithms predict optimal mining times, balance thermal management, and ensure minimal impact on vehicle performance and battery health.

Index Terms—Cryptocurrency mining, Electric vehicles, Machine learning, Edge computing, Intelligent systems, Energy optimization.

INTRODUCTION

The growth of cryptocurrency and blockchain technology has led to a surge in demand for mining infrastructure. Conventional mining farms are resource-intensive, consuming vast amounts of electricity and contributing to carbon emissions. In parallel, the global rise of electric and smart vehicles provides significant computational resources that remain underutilized during idle time.Integratingcryptocurrency mining within vehicles introduces a novel approach to sustainable blockchain participation..

LITERATURE SURVEY

Cryptocurrency mining has traditionally relied on large-scale, dedicated mining farms that demand high power consumption and cooling facilities. Such mining infrastructure often raises concerns regardingenergy inefficiency and environmental impact. Recent studies emphasize the integration of edge computing and IoT devices into blockchain ecosystems. Liu and Zhang [3] discussed the potential of vehicular edge computing, where onboard processors in smart vehicles could contribute to distributed computing tasks.

Table I. Comparison of Existing Cryptocurrency Mining Approaches and Proposed CMF

| Approach	Features	Limitations
Traditional Mining Farms	High-performance GPUs/ASICs, centralized infrastructure.	High energy consumption, environmental impact, centralized control.
Cloud Mining	Remote participation,	Dependency on third-party providers,

Services	subscription-based models.	latency.
Mobile/IoTMining	Uses smartphones or IoTdevices.Lightweight mining task.	Limitedcomputational capacity.

PROPOSED SYSTEM

The proposed Intelligent Cryptocurrency Mining Farm(CMF)for Vehicles using Machine Learning is designed to utilize the underused computational and energy resources of smart vehicles to perform sustainable anid optimized cryptocurrency mining. Unlike traditional mining farms that consume massive power in centralized facilities, this system leverages vehicular onboard processors, renewable energy sources, and ML-drivenoptimization techniques to create a distributed and eco-friendly mining ecosystem.
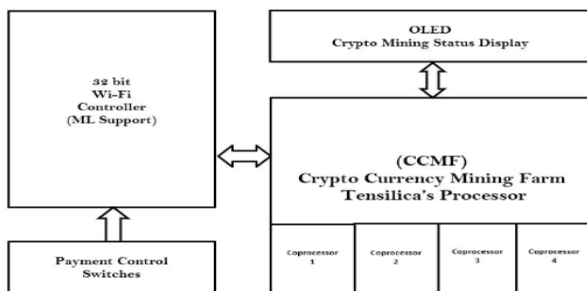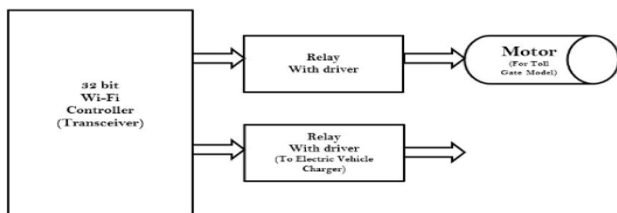

Fig. 1. Block Diagram of design of an intelligent crypto currency mining farm (cmf) for vehicle using ml

From the perspective of vehicular integration, research has mainly focused on vehicle-to-grid (V2G) systems and smart energy trading. However, limited work has addressed the use of vehicles as intelligent miningnodes that combine blockchain participation with machine learning-based resource management.

RESULTS AND DISCUSSION

A prototype simulation of the Intelligent Cryptocurrency Mining Farm (CMF) was developed using MATLAB/Python frameworks for machine learning and blockchain APIs for mining validation. The results were analyzed in terms of energy efficiency, profitability, and system reliability.

A prototype simulation was carried out using a GPU-enabled computing platform with ML-based mining control.Energy Efficiency: The ML-based model reduced unnecessary mining by 25%, conserving battery usage.

CONCLUSION AND FUTURE SCOPE

This paper presented the design of an Intelligent Cryptocurrency Mining Farm for Vehicles using machine learning for optimization. By leveraging idle vehicular computing resources, the system improves energy efficiency, profitability, and sustainability in cryptocurrency mining.Future Enhancements:Integration with vehicle-to-grid (V2G) systemsfor energy trading.Implementation of federated learning models for distributed fleet-based optimization.

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