

1.1 Motivation/Purpose/Aims/Hypothesis

This paper conducts a systematic literature review on distributed machine learning in edge computing, with a focus on the challenges of implementing machine learning and deep learning algorithms on edge devices. The primary motivation is the need to address the limitations of edge devices compared to traditional cloud devices. The paper aims to investigate these challenges and how techniques are adapted or designed to run efficiently on resource-constrained edge devices. The underlying hypothesis is that edge intelligence can mitigate the drawbacks of cloud-based machine learning, offering lower latency, improved security, and enhanced privacy.

1.2 Contribution

The paper contributes by providing an extensive review of distributed machine learning in edge computing. It explores various techniques and strategies related to edge caching, training, inference, and offloading. The key contributions include insights into the potential of edge intelligence in mitigating the challenges of traditional cloud-based machine learning, thus reducing latency and improving data security and privacy. The paper also presents framework development, serving as a reference source for future edge intelligence research.

1.3 Methodology

The methodology involves a systematic review of existing literature on distributed machine learning in edge computing. It covers a wide range of techniques and strategies related to edge caching, training, inference, and offloading. The paper critically analyzes these approaches and discusses their implications in various applications.

1.4 Conclusion

In conclusion, this paper highlights the importance of edge intelligence in addressing the limitations of running machine learning on edge devices. It emphasizes the potential benefits of reduced latency, improved security, and enhanced privacy offered by edge intelligence. The comprehensive review of techniques and frameworks provides a valuable resource for future research in this domain.

2.1 First Limitation/Critique

One limitation of the paper is that it focuses on existing techniques and frameworks without proposing novel solutions or addressing specific challenges in implementing edge intelligence. While it provides a comprehensive overview, it could benefit from more in-depth analysis or practical case studies.

2.2 Second Limitation/Critique

Another limitation is the paper's limited exploration of real-world applications and use cases. It would be beneficial to provide more examples of how edge intelligence can be applied in specific industries and scenarios to illustrate its practical relevance.

3.1 Synthesis

The ideas presented in this paper lay the foundation for potential applications and future research in the field of edge intelligence. The integration of machine learning on edge devices has the potential to revolutionize various industries. Future scopes involve the development of innovative techniques, practical case studies, and the exploration of new applications for edge intelligence.