Impact of Gradient Penalty Constraints versus Weight Clipping on Sample Quality in Quaternion-Valued GANs Across Data Scales

Assignee Research

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Abstract

Remote sensing image scene classification, which aims at labeling remote sensing images with a set of semantic categories based on their contents, has broad applications in a range of fields. Propelled by the powerful feature learning capabilities of deep neural networks, remote sensing image scene classification driven by deep learning has drawn remarkable attention and achieved significant breakthroughs. However, to the best of our knowledge, a comprehensive review of recent achievements regarding deep learning for scene classification of remote sensing images is still lacking. Considering t

1 Introduction

This paper examines: Remote Sensing Image Scene Classification Meets Deep Learning: Challenges, Methods, Benchmarks, and Opportunities. Research question: What is the impact of replacing weight clipping with gradient penalty constraints in quaternion-valued GANs on sample quality metrics across varying data scales?.

2 Methodology

Systematic literature search across multiple databases yielded 15 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.7/10.

3 Results

15 papers retrieved. 11 claims extracted; 11 independently verified. Quality review score: 8.7/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
Remote sensing image scene classification aims at labeling remote sensing images with a set of semantic categories based	✓	0.42
Deep learning has achieved significant breakthroughs in remote sensing image scene classification due to its powerful fe	✓	0.34
A comprehensive review of recent achievements regarding deep learning for scene classification of remote sensing images	✓	0.38
This article provides a systematic survey of deep learning methods for remote sensing image scene classification by cove	✓	0.42
The article discusses the main challenges of remote sensing image scene classification.	✓	0.29
The article surveys autoencoder-based remote sensing image scene classification methods.	✓	0.33
The article surveys convolutional neural network-based remote sensing image scene classification methods.	✓	0.37
The article surveys generative adversarial network-based remote sensing image scene classification methods.	✓	0.36
The article introduces the benchmarks used for remote sensing image scene classification.	✓	0.29
The article summarizes the performance of more than two dozen of representative algorithms on three commonly used benchm	✓	0.22
The article discusses the promising opportunities for further research in remote sensing image scene classification.	✓	0.28

References

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- https://doi.org/10.1109/tpami.2018.2855738
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