

GAN assisted image augmentation for efficient classification of small datasets

Friday 13 September 2024 10:00 (20 minutes)

Generative machine learning models are of increased interest in recent years. While their usage is expanding to multiple fields especially with goal of replacing time consuming repeatable tasks. However such models can be utilised for improving performance of models that are designed for classification tasks. We discuss application of Generative Adversarial Networks for image augmentation in classification of small datasets. In particular GAN assisted augmentation is compared to classical approach based on affine image transformations. For the proposed augmentation pipeline the StyleGAN2-ADA model is used as it provides built-in adaptive augmentation during the training step. This allows to compare different approaches for integrating a GAN based augmentation into a classification framework. GANs typically require large amounts of data to train effectively, which can be a limitation in scenarios where data is scarce. ADA aims to overcome this limitation by enhancing the data efficiency of GANs, allowing them to train on smaller datasets without sacrificing performance or image quality.

References

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Session Classification: Session 6 - Poster Session B