

## Improved attentive pairwise interaction (API-Net) for fine-grained image classification

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### ABSTRACT

Fine-grained classification is a challenging problem as one has to deal with a similar class of objects but with various types of variations. For more elaboration, they are almost similar and have subtle differences, and are confusing. In this study, aircraft will be the fine-grained object to be focused on. Aircraft which has almost similar shapes and patterns can be hardly recognized even for humans, especially those who haven't gone through any training. In recent years, a lot of proposed methods addressed to solve the difficulties in fine-grained problems by learning contrastive clues from an image. This study aims to increase the accuracy of the Attentive Pairwise Interaction Network (API-Net) by introducing data augmentation into the network structure. Some of the previous studies proved that data augmentation does help improve a network. So, this study is going to modify the API-Net with different data augmentation settings. In this study, various settings have been introduced to the API-Net. Several experiments had been done with a simple modification where a portion of the train dataset's images will randomly convert into grayscale images. These settings are, only brightness & contrast 0.2, only grayscale 0.3, only grayscale 0.5, brightness & contrast 0.2 with grayscale 0.3, and brightness & contrast 0.2 with grayscale 0.5. As a result, the proposed modification achieved with 92.74% with brightness & contrast 0.2, 92.80% on brightness & contrast 0.2 with grayscale 0.5, and 92.86% on brightness & contrast 0.2 with grayscale 0.3. While grayscale 0.3 alone achieve 93.25% and grayscale 0.5 alone achieve 93.46% compared with the original results which reached 92.77%.

### KEYWORDS

Data augmentation; Fine grained; Gray scale; Grey scale images; Images classification; IMPROVE-A; Interaction networks; Network structures; Pairwise interaction; Simple modifications

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