NORTH SOUTH UNIVERSITY

Few-Shot Learning - Learning from A Few Examples

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Declaration

It is hereby acknowledged that:

- No illegitimate procedure has been practiced during the preparation of this document.
- This document does not contain any previously published material without proper citation.
- This document represents our own accomplishment while being Undergraduate Students in the **North South University**

Sincerely,

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Approval

I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation.

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Abstract

Classifying visual objects have been a challenge for machines for quite some time. In the past we only depended on traditional machine learning approaches, but now there are lots of deep learning methods and approaches in order to do that. Researchers are still looking for a classification problem solution that requires very few resources, as training a classifier can be quite costly. So, Few-shot learning comes here to solve the problem. Few-shot learning is also known as FSL in short, is a method of identifying unseen/unknown classes (novel classes) with the help of very few examples or references. Although a huge amount of data is needed to train or teach a machine traditionally, it is not required for FSL. It can solve many real-world problems that are not possible using the typical machine learning approaches. Like humans, FSL models can learn by itself to classify visual objects. It uses the knowledge of already known classes to identify the new or unknown class. Also, it can reduce data collection/labeling costs as one of the most problematic step towards a good machine learning project is to collect properly labelled data. Here we'll be working on an algorithm to implement a framework where a resulting classifier will be able to compare and identify previously unseen new classes from a few examples. After meta-training the model will be able to classify the classes comparing the relation between already learned information and input image. The relation will be defined by scalar scores, and the class that gets maximum score will get chosen. This relation-pair method improves the overall performance of FSL.