INT3404E 20: Image Processing - Abstract Report

Group 9

May, 2024

1 Introduction

The report describes our approaches in solving Problem 2 (Sino-Nom Recognition), along with task division and evaluation of the group's work results.

2 Member Information

- Nguyễn Quang Huy - 22028077 (leader)
- Nguyễn Quang Huy - 21020204
- Mai Ngọc Duy - 22028255
- Kiều Minh Khuê - 22028067

3 Our approaches

3.1 ResNet

Our implementation is based on the paper: Deep Residual Learning for Image Recognition [2015].
We have tried ResNet18, ResNet34 and ResNet50 with 2 types of augmentation: no augmentation, black character and white background (-BlackWhite)

- ResNet18: 70% (no augmentation), 63% (-BlackWhite)
- ResNet34: 65% (no augmentation), 61% (-BlackWhite)
- ResNet50: overfitting

3.2 SimCLR (our choice)

Our implementation is based on the paper: A Simple Framework for Contrastive Learning of Visual Representations [2020].
We apply contrastive learning into ResNet18 model, using random rotation, random brightness and random contrast for data augmentation. Result: 80%

3.3 Adding more training data for ResNet and SimCLR

We have tried to use NomNaOCR dataset to add more training data for ResNet and SimCLR, but the model fails to improve due to low quality data extraction.

4 Task division and Evaluation

Name	Task	Evaluation
Nguyễn Quang Huy (22028077)	1. Manage and check team progress 2. Implement the base of all models (ResNet, SimCLR), including forward pipeline and loss function 3. Conduct data labeling of NomNaOCR	40%
Nguyễn Quang Huy (21020204)	1. Implement augmentation for SimCLR 2. Try different versions of ResNet 3. Analyze raw data for data labeling	20%
Mai Ngọc Duy (22028255)	1. Analyze images with false recognition 2. Implement model loading, model saving and result export	20%
Kiều Minh Khuê (22028067)	1. Implement Black&White image filtering for ResNet. 2. Proceed data augmentation and labeling of NomNaOCR	20%