DS 340 Final Project

Weather Image Classification

Joshua Nahm & Seokhoon Shin

Problem Statement

- ★ Weather Conditions can change drastically, & choosing the right clothing for those conditions is often challenging.
  - Many Weather Applications → Do Not provide actionable clothing recommendations.

- ★ Goal : Build ML model that classifies weather conditions from images → and recommend suitable clothing.

Methods

Single CNN

Train: 64.39%
Test: 65.99%

Our Baseline Model had Unsatisfactory Accuracy

VGG19

Train: 84.29%
Test: 77.42%

More probability of Overfitting

ResNet50

Train: 86.22%
Test: 83%

Highest Accuracy & Minimal Overfitting → Best generalization

MobileNet

Train: 84.90%
Test: 80.34%

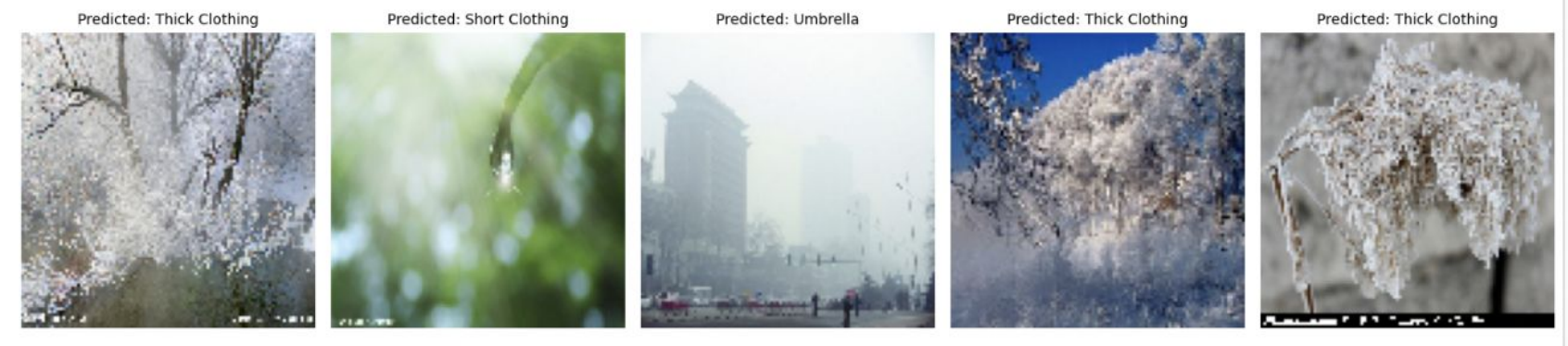
High Accuracy but larger train-test gap compared to ResNet50 model

Challenge

- ★ Overfitting
  - ○ Data augmentation techniques
    - ■ Rotation, zooming, and horizontal flipping
  - ○ Use Pre-trained models
    - ■ ResNet50, VGG19, MobileNet

Results

ResNet50




```
43/43 ━━━━━━━━━━━━━━━━━━━━ 4s 93ms/step
Test Data Accuracy: 83.54%
```

Conclusion & Fun Fact

★ **Importance of Problem Framing : Translating a real-world problem into a ML task required clear goals & careful data preparation.**

★ **Fun fact :** The smallest model (**MobileNet**) required only **30% of the computational resources** of ResNet50 but was approx **3% less accurate**.

Thank you!