Karnataka State Council for Science and Technology
Student Project Programme - 46th Series

Synopsis Report

On

"From Street Photos to Fashion Industrial Trends"

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Keywords: Deep learning, fashion dataset, fashion trends, image clustering, image recognition, multilabel classification, multi-task learning, noisy labels.

Introduction:

As interest has increased in the possible relationships between artificial intelligence (AI) and fashion, more and more approaches are being proposed for fashion recognition and understanding. These street photos on social media sites provide much-needed data for AI research. At the same time, the largescale street images have led researchers to analyze street fashion.

In this work ,RichWear, a new street fashion dataset containing 322,198 images with various text labels for fashion analysis,was created , collected from an Asian social network site, focuses on street styles in Japan and other Asian areas.

The Fashion Attributes Recognition Network (FARNet) based on the multi-task learning framework to improve fashion,is proposed in this work. Instead of predicting each clothing attribute individually, FARNet predicts three types of attributes simultaneously, and, once trained, this network leverages the noisy labels and generates corrected labels based on the input images

Objectives:

1. The main aim of this project is to address the various issues of the noisy labels.
2. To improve fashion recognition, the Fashion Attributes Recognition Network (FARNet) that includes a Noise Correction Network and a Pattern Classification Network on top of a Convolutional Neural Network (CNN) image feature extractor, was proposed in this work.
3. The main objective of this work is focused on the undiscovered street fashion trends in Asia, aggregation of predicted labels and image clusters in the RichWear dataset allows for identification of meaningful trends and discovery of style dynamics.

Methodology:

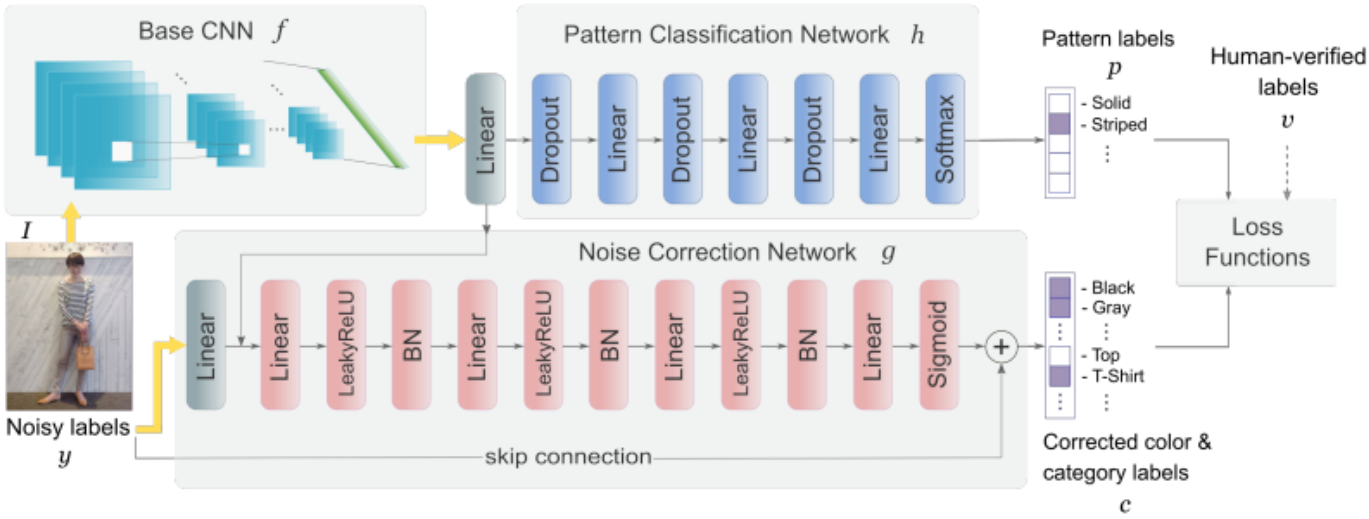


Fig: Architecture Of FARNET

1) **The Noise Correction Network:** This network contains three linear hidden layers of 512 units each and one output layer that is followed by the sigmoid function.
2) **The Pattern Classification Network:** FARNet also contains a Pattern Classification Network h,

which utilizes visual information f(I) to predict the clothing pattern p for a street fashion image. The human-verified labels v is used as the ground truth to supervise the Pattern Classification Network

LOSS FUNCTIONS:

FARNet is designed to jointly learn the label noise correction task and the pattern classification task in a MTL framework. To train the FARNet, we jointly optimize the correction loss of the Noise Correction Network and the classification loss of the Pattern Classification Network. The total loss function is expressed as:

$$\mathbf{Loss_T = \lambda Loss_C + (1-\lambda) Loss_P}$$

where LossC is the correction loss, LossP is the classification loss, and λ is the weight to control the trade-off between the two loss functions.

1) The correction loss : The correction loss for the Noise Correction Network is the binary cross-entropy loss, which can be defined as:

$$\begin{aligned}\text{Loss}_C = -\sum_{i=1}^{N}\sum_{j=1}^{S_1} & v_{i,j} \cdot \log(c_{i,j}) \\ & + (1 - v_{i,j}) \cdot \log(1 - c_{i,j})\end{aligned}$$

The Noise Correction Network is supervised by the verified labels of clothing colors and categories.

2) The classification loss: The Pattern Classification Network uses categorical cross entropy loss:

$$\text{Loss}_P = -\sum_{i=1}^{N}\sum_{j=1}^{S_2} v_{i,j} \cdot \log(p_{i,j}),$$

The Pattern Classification Network is supervised by the verified labels of clothing patterns.

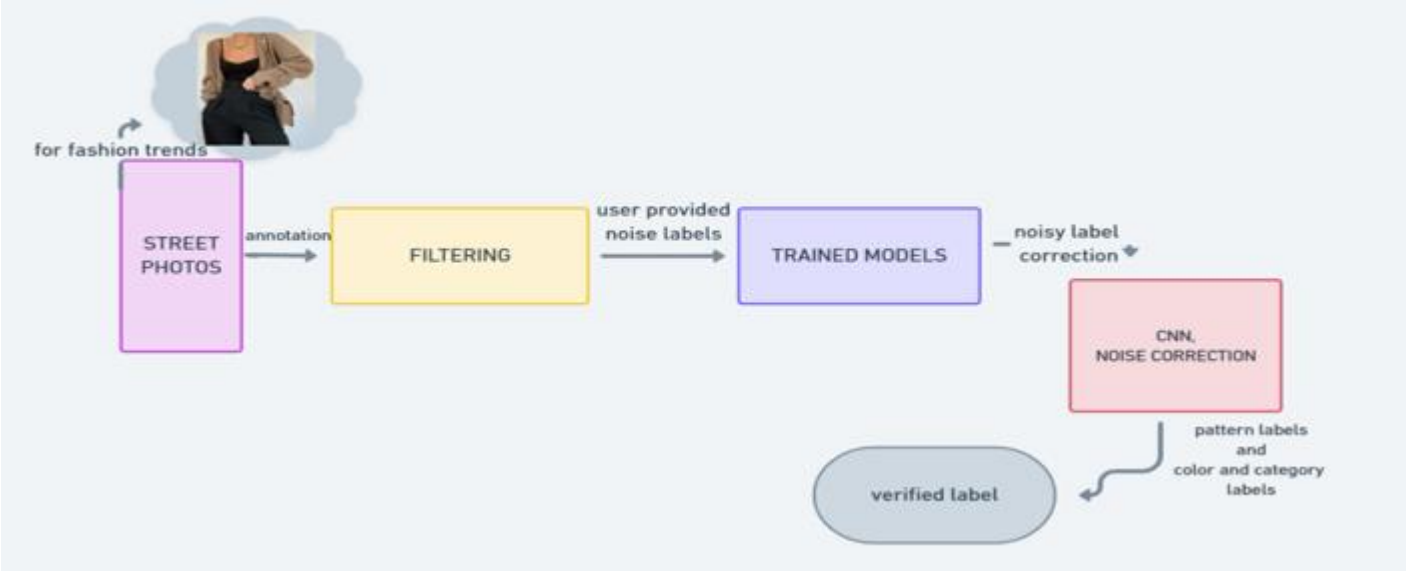


Fig: Sequence Diagram

Results:

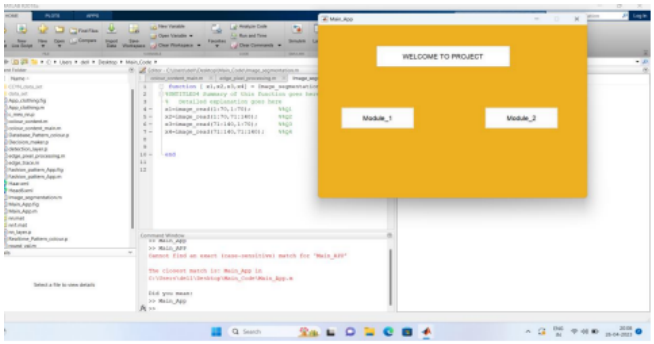


Fig : Main_App

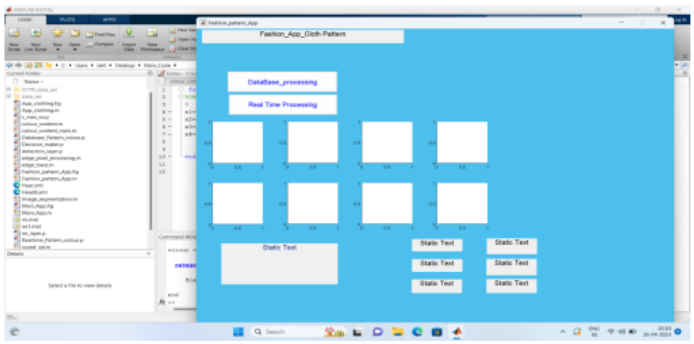


Fig : Module 1

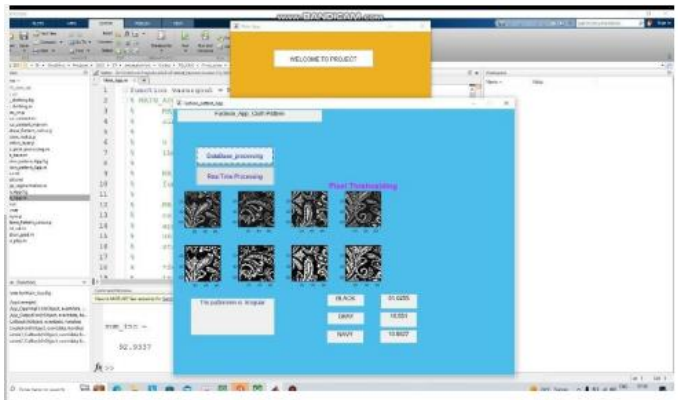


Fig : color and pattern Detection

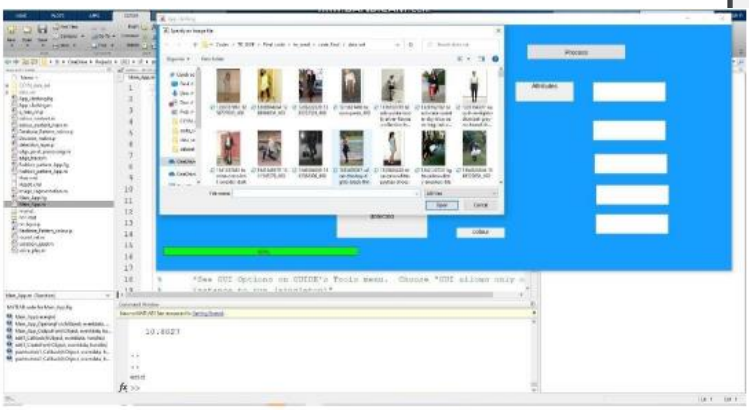
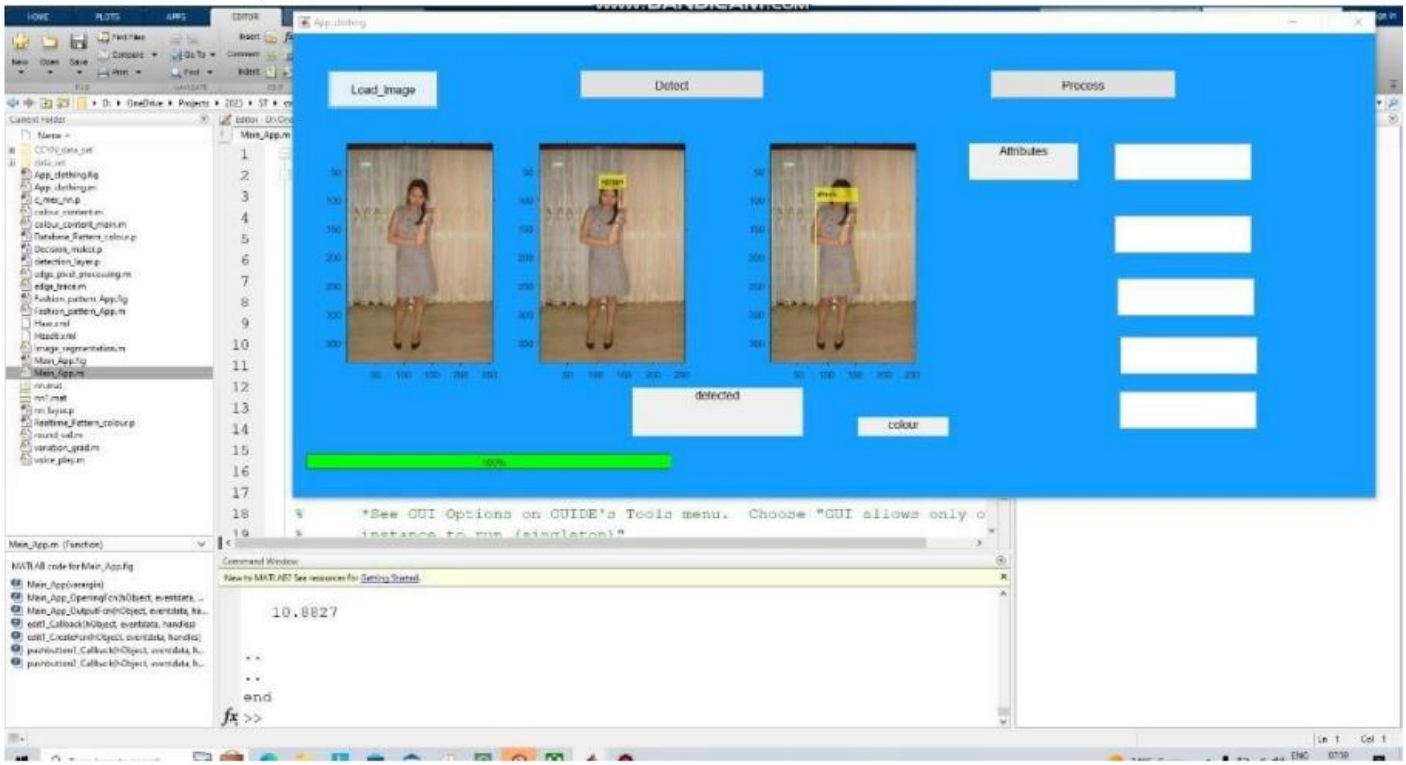


Fig: Data set



Conclusion:

This project aimed to explore Asian street fashion by creating a novel fashion recognition architecture and a large-scale image dataset with user-provided noisy labels, this study developed a new street fashion dataset named RichWear, which contains 322,198 street fashion images with upload date, users' gender and country, clothing brands, and usercreated hashtags. A multi-task neural network, FARNet, which can leverage noisy labels and simultaneously recognize multiple clothing attributes. This network facilitates our street fashion exploration in the large-scale dataset collected from a social media site.

Scope for Future work:

- We can plan to incorporate product and brand information to further refine the fashion trend analysis.
- We can plan to incorporate the mercurial popularity of products and brands, a deeper understanding that may help us predict the rise and fall of a particular product, brand, or style.