

UNDERGRADUATE PROJECT PROPOSAL

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| **Project Title:** | **Fashion recommendation system using deep residual** |
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| **Module Code:** | **CHC 6096** |
| **Module Name:** | **Project** |
| **Date Submitted:** |  |

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# Introduction

## Background

Fashion recommendation is a kind of famous word in our lives. Due to the increasing of people’s requirement of their clothing and life style, the user of fashion recommendation system such as Vogue and YOHO is also increasing. But the most of fashion recommendation system is not personalized for user. The fashion recommendation system with the deep learning training could solve this problem.

## Aim

The aim of my project is to develop a personalized fashion recommendation system using machine learning techniques that offers users tailored clothing suggestions based on their style preference, previous interaction and real-time trends. Ultimately enhancing the user experience in fashion information area and increasing the user satisfaction

## Objectives

The first objective should be learning about the existing product of fashion recommendation system. The second one is using the Deep Residual learning as the machine learning model to develop the system. The third objective is optimizing the system and enhancing the accuracy. The last one is testing the system which is inviting the users to operate the system and ask them for some suggestion.

## Project Overview

### Scope

The purpose of the study is using a deep residual learning framework to train the machine and develop the fashion recommendation system.The study is significant as it addresses the degradation problem in training deep neural networks, which is a major challenge in the field of deep learning. And at the same time,The proposed deep residual learning framework provides a solution to train substantially deeper networks, enabling the development of more powerful and accurate models.

### Audience

The first kind of audience is the researcher or worker in the field of deep learning and computer vision who can benefit from the study's proposed deep residual learning framework, which addresses the degradation problem in training deep neural networks and enables the training of substantially deeper networks. The second kind of audience is the developers and engineers working on image recognition tasks. They can benefit from the study's residual networks are easier to optimize and can achieve higher accuracy with increased depth. This can lead to the development of more powerful and accurate image recognition models.

# Background Review

The source shows me a deep residual learning framework to deal with the challenge of training deep neural networks. This framework restructures layers as residual functions with respect to input layers, simplifying optimization and improving accuracy with increased depth. The study offers substantial empirical proof of residual networks' effectiveness, achieving a 3.57% error rate on the ImageNet test set and securing 1st place in the ILSVRC 2015 classification task. Furthermore, the research examines the impact of depth on visual recognition tasks, revealing a 28% relative enhancement in the COCO object detection dataset. The paper underscores the versatility of the residual function, which can consist of two or three layers, and the significance of identity shortcuts in training. These findings have valuable implications for researchers, practitioners, and developers in the fields of deep learning, computer vision, and industries reliant on visual recognition tasks.

# Methodology

## Approach

The core machine learning model employed is the deep residual network(ResNet) for image recognition. ResNet is a deep neural network architecture that introduces residual connections, allowing the network to learn residual functions which will make it easier training the network .And the ResNet uses residual blocks where each block consists of multiple layers. It also incorporates identity shortcuts and zero-padding for increasing dimensions. The mathematical basis could be using another form to present each layer of the neural network as the learning residual function with the reference layer inputs. By explicitly letting the layers approximate a residual function F(x) : H(x) - x, the original function becomes F(x) + x, which can be learned more easily. And for the algorithm detail aspect, the algorithm involves training deep residual networks by stacking residual blocks. The residual function is computed by adding the input to the output of the layers, allowing the network to learn the residual mapping.

## Technology

In the hardware aspects, it should be a computer with a NVIDIA 2070 GPU or higher because of the huge number of the images which should be dealt with and the computer should also be able to handle the computing requirements of training deep neural networks. In the software aspects, the data set like ImageNet and the CIFAR-10 should be used in the deep learning step. The deep learning framework will also be used such as TensorFlow and PyTorch. And the recommendation system within ResNet framework combining deep learning techniques with collaborative filtering, or hybrid methods. User interface which is also called front-end is also important, so the technologies like HTML, CSS, and JavaScript would be used . And for the back-end, I decide use python to develop the back-end.

## Version management plan

I decide to use the FeiShu to manage the version.

# Project Management

## Activities

|  |  |  |
| --- | --- | --- |
|  | Activities | Detail |
| 1 | Learning about the existing product of fashion recommendation system. | 1. Find some relevant software and list the specific feature of them 2. Review the resources and understand the model |
| 2 | 1. Develop the ResNet model for the fashion recommendation system | 1. Train the model 2. Implement the model 3. Find the data set and use it with the model |
| 3 | Optimize the system and enhancing the accuracy | 1. Train the model with the data set 2. Test and fix bugs(experiment) 3. Check the algorithm and computing accuracy |
| 4. | Inviting the users to operate the system | 1. Invite user to use the system 2. Ask for the suggestion 3. Improve the system |

## Schedule

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| --- | --- | --- |
|  | Activities | Deadline |
| 1 | Learning about the existing product of fashion recommendation system. | 2023.10 - 2023.11 |
| 2 | 1. Develop the ResNet model for the fashion recommendation system | 2023.11 - 2023.12 |
| 3 | Optimize the system and enhancing the accuracy | 2023.12 - 2024.2 |
| 4. | Inviting the users to operate the system | 2024.2 - 2024.4 |

## Data management plan

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|  |  |  |
| 1 | Data management | Git Hub |
| 2 | Code management | FeiShu |
| 3 | Literature management | Baidu drive |
| 4. | Report management | FeiShu |

## Project Deliverables

|  |  |  |
| --- | --- | --- |
|  | Resources | Deliverable |
| 1 | Project proposal | 1. It should be clear and completed. 2. It should show the detail content of the project |
| 2 | Progress report | 1. It should be clear and logical 2. It should show the detail content of the progress 3. The experiment result should be true and useful |
| 3 | Final report | 1. It should be clear 2. It should show the overall of the project |
| 4. | Project code | 1. It should be valid and implement all the function of the system 2. It should be coded independently 3. It should be efficient |

# References

Regarding citations and references, students must adhere to the University guidelines or IEEE referencing style.

**Students doing software development-based projects can cite related websites, web applications, developer documentation, etc. They can cite related articles to their projects, but it is not required. Students doing research-oriented projects should focus on citing research articles. They can also cite appropriate websites whenever necessary.**

## Formatting Requirements

Your written assignments must be presented in the following format:

* It must be word-processed in 11-point Arial font
* It must be black text on a white or ivory background
* All pages must be numbered
* Margins must be as follows: Top: 1 inch, Bottom: 1 inch (2.5 cm), Left: 1.25 inches, Right:
* 1.25 inches (3.2 cm)
* Use a line spacing of 1.5
* Numbers and captions to figures and tables should be at the bottom of the figure or table. If the figure or table is mounted sideways into the report, then its bottom is on the right-hand side of the report. **All tables and figures must be labeled**.
* Normally, the report should not contain more than 80 tables/figures.

## Written Presentation

* The project proposal must have a concise written presentation and referencing style.
* It should also have a clear & logical presentation.

**NB:**

1. **All the text in red colour are basic guidelines and must be DELETED after using this guide.**
2. **Finally, update the “Table of Contents” appropriately to display the correct section titles and corresponding page numbers.**