



**FINAL YEAR PROJECT REPORT**

**IMAGE CLASSIFICATION OF CLOTHING  
ARTICLES**

**In fulfillment of the requirement  
For degree of  
BS (COMPUTER SCIENCES)**

**By**

**HUZAIFA SHAHID  
AHSAN GHAFAR  
NOMAN AHMED**

**48451 BSCS  
48411 BSCS  
48453 BSCS**

**SUPERVISED**

**BY**

**DR. RAHEEL SIDDIQUI**

**BAHRIA UNIVERSITY (KARACHI CAMPUS)**

**FALL-2020**

## DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

Signature :           Huzaifa          

Name : HUZAIFA SHAHID

Signature :           Ahsan          

Name : AHSAN GHAFFAR

Signature :           Noman          

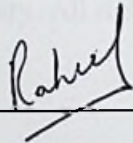
Name : NOMAN AHMED

**APPROVAL FOR SUBMISSION**

We certify that this project report entitled “**IMAGE CLASSIFICATION OF CLOTHING ARTICLES**” was prepared by **AHSAN GHAFAR, HUZAIFA SHAHID, NOMAN AHMED** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Computer Science at Bahria University.

Approved by,

Signature :



Supervisor :

Dr Raheel Siddiqui

Date

:

12-14-2020



## ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project mid evaluation. We would like to express my gratitude to my research supervisor, Dr. Raheel Siddiqi for his invaluable advice, guidance and his/her enormous patience throughout the development of the research.

In addition, we would also like to express my gratitude to our loving parent and friends who had helped and given me encouragement.

## IMAGE CLASSIFICATION OF CLOTHING ARTICLES

### ABSTRACT

A picture is worth a thousand words. Albeit a cliché, for the fashion industry, an image of a clothing article allows one to perceive its category (e.g., dress, coat, shirt, sneakers, etc). Image classification is a classical Computer Vision problem.

By what method may we approach composing a calculation that can characterize pictures of apparel articles into particular classifications like shirts, jeans, dress, and shoes? PC Vision scientists have concocted an information driven way to deal with address this. Rather than attempting to determine what all of the picture classifications of premium look like straightforwardly in code, they give the PC numerous instances of each picture class and afterward create learning calculations that take a gander at these models and find out about the visual appearance of each class. In other words, they first accumulate a training dataset of labeled images, then feed it to the computer in order for it to get familiar with the data.

Despite the fact that the current customary picture grouping strategies have been generally applied in functional issues, there are a few issues in the application cycle, for example, inadmissible impacts, low order accuracy results, and feeble versatile capacity. The deep learning model has an amazing learning capacity, which coordinates the component extraction and order measure into an entire to finish the picture grouping test, which can adequately improve the picture characterization precision. To apply this image classification algorithm, we use Convolutional Neural Networks (CNNs) which is the most popular neural network model being used for image classification problem. The large thought behind CNNs is that a nearby comprehension of a picture is adequate. The reasonable advantage is that having less boundaries enormously improves the time it takes to learn just as decreases the measure of information needed to prepare the model. Rather than a completely associated network of loads from every pixel, a CNN has barely enough loads to take a gander at a little fix of the picture. It's like reading a book by using a magnifying glass. The magnificence of the CNN is that the quantity of boundaries is autonomous of the size of the first picture. You can run a similar CNN on any picture of any goal, and the quantity of boundaries won't change in the convolution layer.

## TABLE OF CONTENTS

	<b>DECLARATION</b>	2
	<b>APPROVAL FOR SUBMISSION</b>	3
	<b>ACKNOWLEDGEMENTS</b>	5
	<b>ABSTRACT</b>	6
	<b>TABLE OF CONTENTS</b>	7
	<b>LIST OF FIGURES</b>	10
	<b>LIST OF APPENDICES</b>	12
<b>CHAPTER</b>		
<b>1</b>	<b>INTRODUCTION</b>	<b>13</b>
1.1	Background	13
1.2	Problem Statement	13
1.3	Aims and Objectives	14
1.4	Scope of Project	14
1.5	Benefits Of Project	14
<b>2</b>	<b>LITERATURE REVIEW</b>	<b>15</b>
2.1	Introduction	15
2.2	Previous Work	15
2.2.1	Categorize Clothing Articles	15
2.3	Summary	<u>18</u>
<b>3</b>	<b>DESIGN AND METHODOLOGY</b>	<b>19</b>
3.1	Introduction	19
3.2	Useful Libraries	19
3.3	Data Set	19
3.4	Explore Dataset	20
3.4.1	Image Dimensions	21
3.4.2	Image Shape	21



		8
	3.4.3	Total categories/Labels 22
	3.4.4	Total training and testing records 22
	3.4.5	Graphical representation of Data 22
	3.5	Programming Language 23
<b>4.</b>	<b>IMPLEMENTATION</b>	<b>24</b>
	4.1	Load Dataset 24
	4.2	Data Preparation 24
	4.3	Define Model 25
	4.3.1	Keras Tuner 25
	4.3.2	Select Best Model 27
	4.3.3	Train Model 28
	4.3.4	Save Model 28
	4.3.5	Evaluate model 28
	4.3.6	Test Model 30
	4.3.7	Implementation of data augmentation 31
	4.3.7.1	Test Model Again 33
	4.3.8	FLASK Framework for GUI 33
<b>5.</b>	<b>RESULTS AND CONCLUSIONS</b>	<b>35</b>
	5.1	Discussion on model accuracy 35
	5.1.1	Accuracy with First Attempt 35
	5.1.2	Accuracy with some experiments 35
	5.1.3	Accuracy after using keras tuner Library 36
	5.1.4	Accuracy after using data augmentation 36
	5.2	Discussion On GUI for our model 37
	5.2.1	Android Application 37
	5.2.2	FLASK framework for python 37
<b>6.</b>	<b>CONCLUSION AND RECOMMENDATION</b>	<b>38</b>
	6.1	Conclusion 38
	6.2	Recommendation 38
<b>7.</b>	<b>REFERENCES</b>	<b>39</b>