



**TRIBHUVAN UNIVERSITY  
INSTITUTE OF ENGINEERING  
PASHCHIMANCHAL CAMPUS**

**A PROJECT REPORT  
ON  
HOME AUTOMATION USING SPEECH RECOGNITION**

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**TRIBHUWAN UNIVERSITY**  
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The undersigned certify that they have read, and recommended to the Institute of Engineering for acceptance, a project report entitled "HOME AUTOMATION USING SPEECH RECOGNITION", submitted by Binayak Shrestha, Prakanda Bhandari, Pratham Adhikari, and Sandesh Bashyal in partial fulfilment of the requirements for the Bachelor degree in “**Electronics, Communication and Information Engineering**” has been accepted as a bonafide record of work independently carried out by team in the department.

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## **ABSTRACT**

This section consists of summary of the context

**Keywords:** Deep Learning, Image colorization, EfficientNetB0, CNN, Convolution neural architecture

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## **LIST OF ABBREVIATIONS**

AI	Artificial Intelligence
CNN	Convolution Neural Network

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Background**

This is the background.

### **1.2 Problem Definition**

Mention and explain about the problem statement.

### **1.3 Objectives**

The objectives of this project are:

- To .. . . . . .
- To . . . .

### **1.4 Features**

The features of our project are as follows:

- Feature 1
- Feature 2

### **1.5 Feasibility**

#### **1.5.1 Technical Feasibility**

Technical

### 1.5.2 Operational Feasibility

Operational

## 1.6 System Requirements

The system requirements of our project are:

### 1.6.1 Software Requirements

The software requirements for our project are as follows:

- (a) Android: 5.1+
- (b) Libraries of Python: Bumpy, Pyplot, Skimage, Scipy, open CV, Numpy, Matplotlib, Beautiful Soup
- (c) Libraries of Deep Learning : Tensorflow and Keras colorize

### 1.6.2 Hardware Requirements

The hardware requirements for our project are as follows:

- (a) To run the application:  
PC with specs
- (b) To train the model:

**Table 1.1:** System Specification Table for Google Colab

S.N.	Particulars	System Specification
1	Total RAM	12.69 GB
3	Used RAM	4.85 GB
4	Total disk space	78.19 GB
5	Used disk space	42.77 GB
6	GPU Used	Python 3 Google Compute Engine

### 1.6.3 Functional Requirements

- (a) Requirement1

#### 1.6.4 Non-functional Requirements

##### (a) Requirement1

Lorem ipsum...

## **CHAPTER 2**

### **LITERATURE REVIEW**

Colorization of gray-scale images has become a prominent application of Convolutional Neural Network. With many research works and projects evolving around this domain, various implementations of the CNN architectures have been proposed for the purpose. Typically, optimization methods that optimize each pixel based on user inputs or reference images are used for colorization [? ].

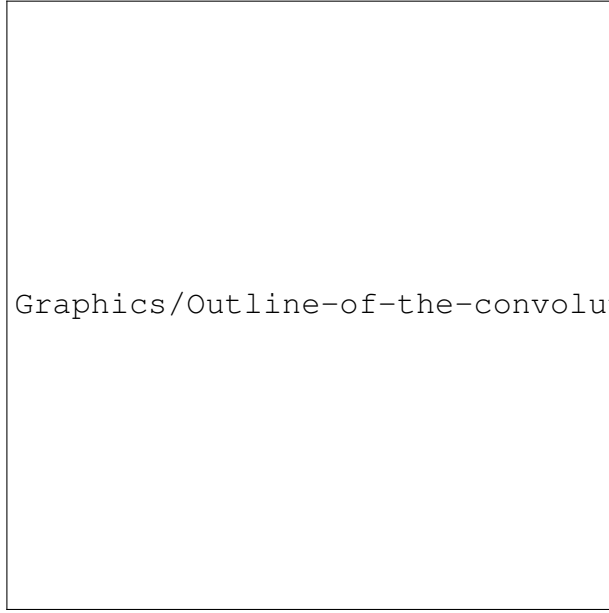
## CHAPTER 3

### RELATED THEORY

#### 3.1 Section1

##### 3.1.1 Subsection

###### a. Sub subsection



Graphics/Outline-of-the-convolutional-layer\_W640.jpg

**Figure 3.1:** Basic Outline of a Convolutional Layer

Where,

$$C(X, \theta) = \frac{1}{2HW} \sum_{k \in a, b} \sum_{i=1}^H \sum_{j=1}^W (X_{k_{i,j}} - \tilde{X}_{k_{i,j}})^2 \quad (3.1)$$

where  $\theta$  represents all model parameters,  $X_{k_{i,j}}$  and denote the  $ij$ :th pixel value of the  $k$ :th component of the target and reconstructed image, respectively. This can easily be extended to be a batch  $\beta$  by averaging the cost among all images in the batch, i.e.  $1/|\beta| \sum_{X \in \beta} C(X, \theta)$ .

## **CHAPTER 4**

### **METHODOLOGY**

#### **4.1 SYSTEM BLOCK DIAGRAM**

The block diagram of our system is as follows:

#### **4.2 DATASET**

##### **4.2.1 Preparation of Dataset**

Example



**CHAPTER 5**  
**EXPECTED OUTPUT**

## **CHAPTER 6**

### **EPILOGUE**

#### **6.1 CONCLUSION**

#### **6.2 LIMITATIONS**

#### **6.3 FUTURE ENHANCEMENT**

## **APPENDIX A**

### **APPENDIX**

Project Timeline