# DECLARATION

I **Mayank Kumar Singh(38110312)**hereby declare that the Project report entitled "**GUI BASED PYTHON CODE GENERATOR FOR CNN**" donebyusundertheguidanceof**Mr.Kamalesh M.E.is** submitted in partial fulfilment of the requirements for the award of**Bachelor of Engineering degree**in the**Department of Computer Science and Engineering.**

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**DATE:**

**PLACE:**                              **SIGNATURE OF THECANDIDATE**

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# ABSTRACT

The data mining is a process that is basically used to mine the data and give the result that are hiddentothe internal database. The data mining is done in very formal that are basically used in medical field, engineering field and quite also in technical field. The data mining basically uses the machine learning algorithm which are predictable in nature. The heart disease prediction is basically a process which took some of the information from the user and then mine the data to predict the answer i.e, it has heart disease or not.Following are some datamining technique that are used for the prediction. These are Random Forest Decision Tree & Nave Bayes etc. from the algorithm procedure it is formed the Random Forest has the best accuracy and precision with 81% when composed too the algorithm for heart disease prediction.

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# CHAPTER-I

# INTRODUCTION

## 1.1 Overview

Python code Generator (PYCOGEN) serves the purpose of Low code Generator tool for CNN Architecture using Graphical User Interface(GUI).This tool provides the platform that aids in the better interaction of the User with an interactive GUI that visualize complex Convolutional Neural Network (CNN) Architecture and that makes it possible to generate CNN model code in Python, which can further be implemented in Users machine learning and deep learning projects

## 1.2 Objectives

The objective of this software is:

❖ To design and develop an in-browser Code Generator low code tool for generating python code.

Which is:-

- Interactive
- Easy to use
- Modular

❖ To develop a GUI based tool to visualize and generate CNN model code in python language.

## 1.3 Product Perspective

CNN is a broad field and it requires heavy parameter optimization and experimentation before arriving at a particular result. That being said, if you want to take a more automated approach to CNN architecture design, look up "neural architecture search" and "neuro-evolution". These approaches tend to be pretty heavyweight (i.e., you're going to need a cluster) but the idea is to automate the design process to find an "optimal" network. Neural architecture search strategies tend to use machine learning approaches (e.g. , recurrent neural networks to generate the structure, or reinforcement learning) while neuro-evolution strategies rely on evolutionary algorithms.

Our Tool allows for the development of Architectures straight on the Web Browser without writing any Code which can be experimented with and used for our Deep Learning Project.

## 1.4 Product Functions

This Product plays a major role in generating the python Code of a CNN architecture model as required by the user. The product helps developers visualize CNN model architecture structures as well as the processes of internal feature abstractions, and final inference generation code. This Product is interactive for changing and making alterations according to the user requirement.

For working on a machine & deep learning projects where user (most likely programmers and developers)are challenged to face the use of Convolutional neural network model in their product to make their product competitive and more appealing, in this conduct our product gives an advantage to the user by making a tedious task hassle free and more customized according to needs and requirement.

The key functions of the product is to generate the CNN Architecture base model by giving user an interactive user interface to deal with their approach for the deep learning or machine learning projects and researches the key noted feature are as follows:

- Have a Build Section where the Layers can be added and Removed. In addition, we have a Node Count where we can increase the Nodes. We can also set up Activation Functions and Weight Initializers along withit.

- Have a Learn Section where the Optimizer Function can be set along with the Loss Function. We also have a Learning Rate Specifier and a Learning Rate DecayParameter.

- Have a Train Section where we can specify the number of Epochs till which we can train the Model and the Batch Size.
- Once we specify all these features, we will get a generated code which can be used in our Neural Network Architecture for Data Modeling. We can also visualize the Neural Network automatically on the Browser UI itself for the better purpose.

## 1.5 User Classes and Characteristics

- Typical Users, such as students/scholars, who want to use this tool for analyzing and generating architecture model code for convolution neural networks(CNN).

- Advanced/Professional Users, such as data scientists and data engineers or researchers, who want to use this software for more demanding coding and analysis implementations.
- Programmers who are interested in working on the project by further developing it or fix existing bugs.

## 1.6 Operating Environment

The working Environment for the Code Generator requires the least configuration of all as it is a web based In-Browser system. Users need to have a python working environment to implement the generated code or e.g. Jupyter Notebook, Google colaboratory and other IDE's. While bandwidth and hardware upgrades may most likely be required, the current architecture can largely be maintained.

The website is expected to be hosted on a build server that is in-house and resides on hardware that will be maintained by the Host. This can be executed in the form of a virtual machine to allow growth for website traffic. Having the web server run on a virtual machine will allow for extremely easy migration of the web server in the event that the owner wishes to outsource web hosting to an external company. A build server is also expected to reside on the virtual machine for the purposes of storing and retrieving system data.

Due to the web-based nature and of the system, it will be largely compatible with any device that is capable of internet access and has a web browser JavaScript enabled with JSX support except Internet Explorer. The website will be coded with industry standard practices to keep compatibility issues to a minimum.

The most popular web browsers except Internet Explorer in the world are recommended as they privilege special care and ensure optimum compatibility. As such, all latest browsers are recommended for use.

For developers, programmers, testers and host the operating requirement needs to have a running system with Node.js enabled if deployed on local machine and on a build server it is to be deployed on internet and domain of selection which suits the requirement and reach of the targeted audiences.

## 1.7 Existing Technology

**1) - Pix-to-code:** Generating Code from a Graphical User Interface Screenshot

Transforming a graphical user interface screenshot created by a designer into computer code is a typical task conducted by a developer in order to build customized software, websites, and mobile

applications. In this paper, we show that deep learning methods can be leveraged to train a model end-to-end to automatically generate code from a single input image with over 77% of accuracy for three different platforms (i.e. iOS, Android and web-based technologies).

**2)** -**Cog**

Cogis a simple code generation tool written in Python. We use it or its results every day in the production of Kubi.

Kubiis a collaboration system  embodied in a handful of different products .We have a schema that describes the representation of customers' collaboration data: discussion topics, documents, calendar events, and so on. This data has to be handled in many ways: stored in a number of different data stores, shipped over the wire in an XML representation, manipulated in memory using traditional C++ objects , presented for debugging, and reasoned about to assess data validity, to name a few.

**3)** -**Automatic GUI Creation:**

**4)** Generating Java source code from formal descriptions

**5)** https://www.percederberg.net/text/master/page04.html

**6)** -**Blockly** is a client-side libraryfor the programming language JavaScriptfor creating block-based visual programminglanguages(VPLs) andeditors. A project of Google,it is freeand open-source softwarereleased under the Apache License 2.0.[2]It typically runs in a web browser, and visually resembles the language Scratch.It is also being implemented for the mobile operatingsystemsAndroidand iOS, though not all of its browser-based features will be available on those platforms.

Blockly uses visual blocks that link together to make writing code easier, and can generate code in JavaScript, Lua,Dart,Python,or PHP.It can also be customized to generate code in any textual programminglanguage

# CHAPTER-II

# REQUIREMENT ANALYSIS

## 2.1 Functional Requirements

The Functional Requirement for PyCoGen elements are as follows:-

Note:-Please refer to the element Dictionary table for all the elements that are to be displayed on the screens

| Sr.No | Name | Description | Control Type | Default Value | Validation |
|---|---|---|---|---|---|
| 1 | Add Layer | To add the layer of ConvNet | Radio | 1 | when this option is selected a ) - if no layer exist add the layer b)-add the layer to the previous layer of the ConvNet |
| 2 | Remove Layer | To Remove the Layer of ConvNet | Radio | 0 | When the option is selected the layer are to be removed from the ConvNet until there is 0 layers |
| 3 | Node Count | To enter the node count on each layer | Slider | 5 | To set the number of nodes in each layers fo the Convnet |
| 4 | Activation Function | To activate the nodes and layers of the ConvoNet | Dropdown | relu | when this option is selected the user can select from the available options and all parameter instantiates from a configuration library |
| 5 | Weight Initializers | To initialize the Weights of each neuron | Dropdown | glorot uniform | when this option is selected the user can select from the available options and all parameter instantiates from a configuration library |
| 6 | Optimizers | To optimize and to deal with optimization problems by minimizing the function.. | Dropdown | SGD | when this option is selected the user can select from the available options and all parameter instantiates from a configuration library |
| 7 | Learning Rate | The amount that the weights are updated during training is referred to as the step size or the "learning rate." | Dropdown | Mean Squared Error | when this option is selected the user can select from the available options and all parameter instantiates from a configuration library |
| 8 | Learning Rate of the Network | The Learning rate of the entire Convnet model | Slider | 0.001 | To set the Learning rate of Cnvnet Model varying from 0-1 |
| 9 | Learning Rate Decay | It can be defined as the way in which the learn rate changes over time and disal so known as learning rate schedule | Checkbox | N/A | To introduce learning rate decay in a ConvNet by 0.01 |
| 10 | Epochs | Epoch is when an entire dataset is passed forward and backward through the neural network only once | Slider | 100 | To set the no of epochs for training the ConvNet varying from 0-500 epochs according to the user requirements |
| 11 | Batch Size | The batch size impacts how quickly a model learns and the stability of the learning process. | Slider | 32 | To set the no of batchsize for enhancing the stability of the models learning process by |
| 12 | Generated Code | To show the Generated code of ConvNet on a Display Console | N/A | Basic Syntax | To show the Genrated code on a panel fro the desired ConvNet |
| 13 | Model Architecture | To show the ConvNet Model preview of the desired Input | N/A | N/A | To provide a visual and pictoral representation of the desired ConvNet for which the Code is generated |

**Table 1**

- ❖ **Add Layer and Remove Layer**:- The Add/Remove layer features in the build sections requires the user interaction to provide an input to the system for the no of layer with each layers node count defined as desired the user

  Node count:- the default values of the node count is defined as 5, but it can be altered by the user through a slider according to the desired values

  The layer and node count sections input are served to the visualizers and algorithms where the layers and node is being previewed

- ❖ **Activation Functions**:-The user and the client are required to select the activation function from the available options for activation of the nodes in a layer ,although the default values