

# Harmful vs. Harmless Image Classification using Convolutional Neural Network (CNN)

## Introduction

This documentation describes a Convolutional Neural Network (CNN) model for classifying images as harmful or harmless. The model has been trained on a dataset containing 1300 images of harmful objects (e.g., knives) and harmless objects (e.g., pillows, fruits). The goal of this model is to accurately predict whether a given image is harmful or harmless.

## Our approach

We used a pretrained object detection algorithm to detect the objects in the given picture, and then parse the objects to our very own custom trained CNN model that determines the harmfulness of the object, and returns the data to the program to make labeled bounding boxes.

## What we've done so far

We have successfully trained our custom CNN with the provided dataset with an accuracy of 98% and a validation accuracy of 84%. Our loss factor is around 5%. We are able to pass pictures and get feedback if it is harmful or harmless. We tweaked the dataset and removed erroneous data that impacts the accuracy.

## What we have learnt so far

We have learnt the intricacies of a convolutional neural network model, the basics of convolution, maxpooling function, the ReLU activation function, and the basics of Keras functions to create a CNN. We learnt how to parse and work with images using the OpenCV module in Python. We learnt how to plot accuracy and loss data using Plot.