# Documentation for Modified SqueezeNet Training Script

## Overview

This document provides detailed documentation for the Modified SqueezeNet training script. The script implements a machine learning pipeline using TensorFlow and Keras for multi-class classification.

## Installation

Ensure you have Python 3.7+ installed. Install the required dependencies using the following command:

pip install tensorflow scikit-learn matplotlib pandas tqdm scipy

## Configuration

The script is highly configurable. You can specify various parameters via the command line. Refer to the README.md for a detailed list of parameters.

## Data Augmentation

The script supports various data augmentation techniques to improve model generalization. These include Gaussian blur, median filtering, and displacement.

## Model Training Process

The training process includes:  
- Data loading and preprocessing  
- Training with class weights  
- Model checkpointing and early stopping  
- Saving the best and final models

## Output Details

Outputs include training logs, classification reports, confusion matrices, and saved models. Additionally, augmented samples are saved in subdirectories.

## Dataset Preparation

Ensure your dataset is structured as follows:  
dataset\_dir/  
 class\_1/  
 image1.jpg  
 image2.jpg  
 class\_2/  
 image1.jpg  
 image2.jpg

## Future Directions

Potential improvements include adding more augmentation techniques, supporting additional image formats, and optimizing for distributed training.