



Rolls Royce –   
Safety Glass Detection

Local Setup Guide

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# Purpose

This document provides step by step guide to setup Safety Glass Detection demo on standalone windows machine. This setup will work in offline mode without any dependency on external services or tools and internet connectivity.

# Prerequisites

Please ensure following pre-requisites before starting with demo Setup.

1. Windows machine (Min 4GB RAM)
2. Python (Supported versions: 3.6 or later)  
   Download links:
3. <https://www.python.org/downloads/>
4. <https://www.python.org/downloads/release/python-361/>
5. Setup Python Virtual Environment:  
   Reference link:
6. <http://timmyreilly.azurewebsites.net/python-pip-virtualenv-installation-on-windows/>
7. NGINX Webserver:  
   Download link:
8. <http://nginx.org/en/download.html>
9. Setup Code:   
   Module code and trained classification model is shared at following location:   
   <https://s3-eu-west-1.amazonaws.com/rolls-royce-demo-setup/Setup.zip>

# Python Environment Setup

The demo setup requires few python modules to be installed. Following steps will guide you to install all required dependencies on the machine.

## Create a New Virtual Environment

It is recommended to create a fresh virtual environment for this demo setup, so that other updates in the python do not affect required dependencies.

Virtual Environment can be installed in various ways. One of the way is mentioned in below link: <http://timmyreilly.azurewebsites.net/python-pip-virtualenv-installation-on-windows/>

1. Once virtual environment is setup, create a new virtual environment for demo setup.  
   *$ mkvirtualenv safety-glass-demo-env*
2. Switch to newly created environment.  
   *$ workon safety-glass-demo-env*
3. Ensure that all below setup is done in this virtual environment.

## Install Python Dependencies

Required Python dependencies can be installed using “pip install” command.

All dependent modules are listed in requirement.txt file. To install all dependencies, go to folder containing requirement.txt and run following command.

requirements.txt can be found at location: ../Setup/PythonAPIServer/requirements.txt  
*$ pip install -r requirements.txt*

Ensure that the command is executed without any errors.

## Install DLib Python Module

Dlib module may not install using “pip install” command on certain systems. In such case we need to install them using external wheel files or build them locally on the system.

**Installing DLIB with Wheel File:**

*$ pip install* [*https://pypi.python.org/packages/da/06/bd3e241c4eb0a662914b3b4875fc52dd176a9db0d4a2c915ac2ad8800e9e/dlib-19.7.0-cp36-cp36m-win\_amd64.whl#md5=b7330a5b2d46420343fbed5df69e6a3f*](https://pypi.python.org/packages/da/06/bd3e241c4eb0a662914b3b4875fc52dd176a9db0d4a2c915ac2ad8800e9e/dlib-19.7.0-cp36-cp36m-win_amd64.whl#md5=b7330a5b2d46420343fbed5df69e6a3f)

Note: If this step does not work on client machine, we might need to build DLIB module using CMAKE. This is a longer process and will required installation of Visual Studio.  
Reference: <https://www.learnopencv.com/install-dlib-on-windows/>

**Build DLIB Module:**

Build Dlib Module

To build Dlib follow the below instructions.

1. Install cmake: *$pip install cmake*
2. Install Visual Studio 2017: Under Individual Components select and install “Visual C++ tools for CMake”
3. Install dlib: $pip install dlib

Reference: <https://www.learnopencv.com/install-dlib-on-windows/>.

# MXNET Model Server Setup

MXNET Model Server (MMS) is used as classification Server to detect if person in image is wearing safety glass or not. We have already trained a model for classification. This model is to be used with MXNET model server for serving requests.

1. All related files are copied in the folder ‘MXNET’.
2. Move the sub-folder “model-store” to a suitable location. This folder contains trained model for classification.
3. Open file “config.properties” and update above location in property: “model\_store”.
4. From Command prompt, run following command to start MXNET Model Server:  
   *$ mxnet-model-server – start*  
   Ensure that config.properties is at the same location where command is ran.
5. With default settings, server will be running on port 8180.

For details about working with MXNET Server refer:

<https://github.com/awslabs/mxnet-model-server/blob/master/docs/server.md>

# API Server Setup

API Server acts as an Interface server between UI and MMS. Follow below instructions to setup API Server on   
local environment.

1. All related files are copied in folder ‘PythonAPIServer’.
2. Copy the folder at suitable location.
3. Open “application.config” file and update property “script\_dir” to point to location of API Server.
4. Rest configurations can be kept as is for default settings.
5. Ensure that webcam is connected to machine.
6. To run the API Server, run following command:  
   *$ python safetyglass\_gateway.py*

API Server would start on port 8000 by default.

# NGINX Server Setup

NGINX Server is used to host UI module, which is used to run the demo. Ensure that NGINX server is up and running on a port (typically port 80 by default). Once NGINX is up, follow below steps to configure UI module.

1. All related files are copied in folder ‘UI.
2. Copy all contents under UI folder to “html” folder of NGINX.
3. Open file: *../html/app/js/env.js*

Set property *window.\_\_env.apiUrl* to point to API Server

If all modules are setup on same machine and no change is made in API Server port, keep the configuration as is:

*window.\_\_env.apiUrl = 'http://127.0.0.1:8000';*

1. Start NGINX Server

Go to NGINX installation folder and type command:

*$ start nginx*

To Stop NGINX Server use command:

*$ nginx -s stop*

1. Open browser and invoke URL: <http://localhost/>

Safety Glass detection demo will be started on browser.

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