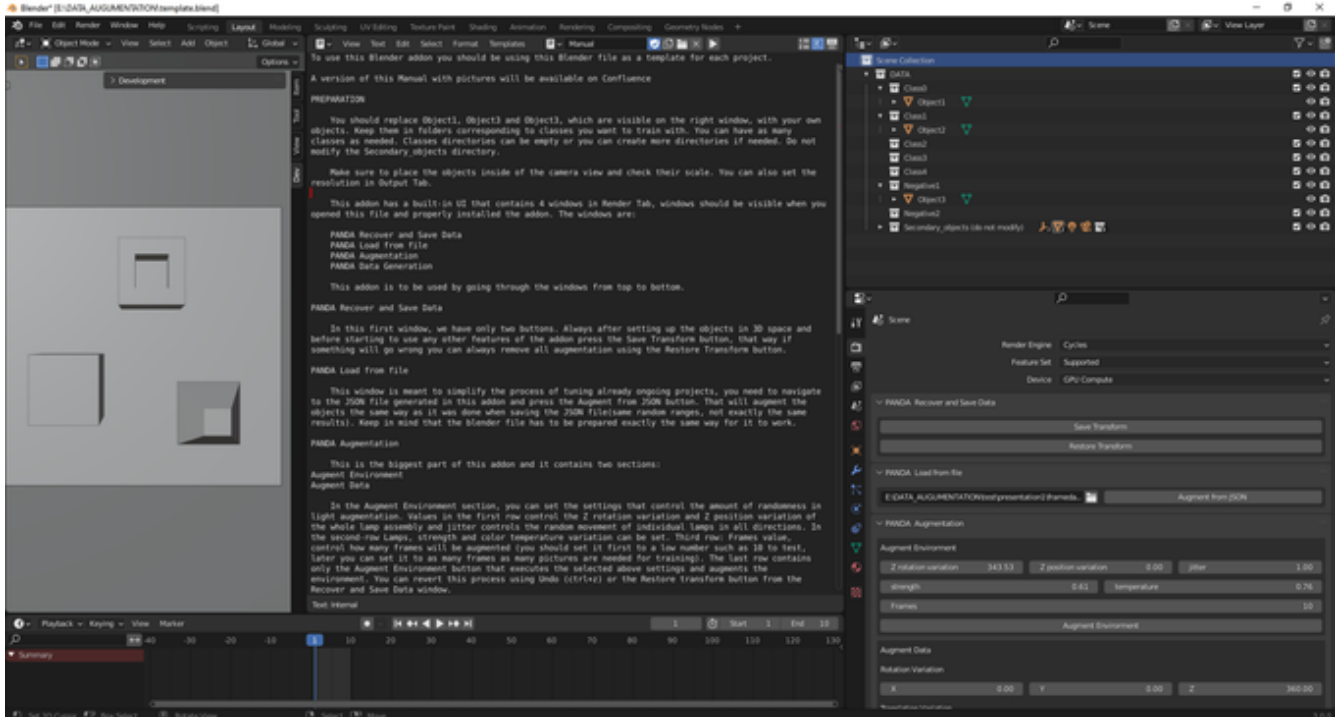


Data Augmentation Manual

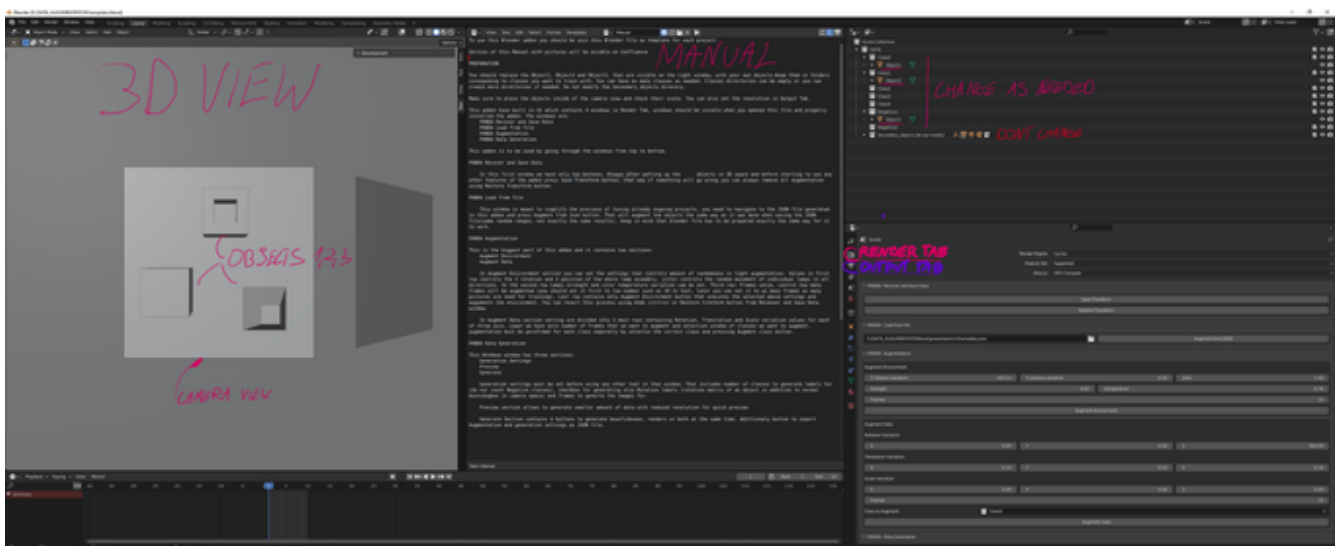
Installation

Reference the readme file

To use this Blender addon you should be using this template.blend from assets folder as a template for each project!



PREPARATION



For Mac/Linux it is recommended to launch blender from the terminal.

After launching Blender, you should replace Object1, Object3 and Object3, which are visible on the right window, with your own objects. Keep them in folders corresponding to classes you want to train with. You can have as many classes as needed. Classes directories can be empty or you can create more directories if needed. Do not modify the Secondary_objects directory.

Make sure to place the objects inside of the camera view and check their scale. You can also set the resolution and output directory in Output Tab.

This addon has a built-in UI that contains 4 windows in Render Tab, windows should be visible when you opened this file and properly installed the addon. The windows are:

PANDA Recover and Save Data

PANDA Load from file

PANDA Augmentation

PANDA Data Generation

This addon is to be used by going through the windows from top to bottom.

PANDA Recover and Save Data

Save Transform

Restore Transform

PANDA Load from file

E:\DATA_AUGMENTATION\test\presentation1\framedata.json

Augment from JSON

PANDA Augmentation

Augment Environment

Z rotation variation343.53Z position variation0.00jitter1.00

strength0.61temperature0.76

Frames10

Augment Environment

Augment Data

Rotation Variation

X0.00Y0.00Z360.00

Translation Variation

X0.10Y0.10Z0.10

Scale Variation

X0.00Y0.00Z0.00

Frames10

Class to Augment:

Class0

Augment class

PANDA Data Generation

Generation Settings

Classes2Rotation labelsFrames10

Preview

Frames5resolution scale1.00

Preview

Generate

Generate Renders and BBs

Generate Renders

Generate BBs

Export JSON

PANDA Recover and Save Data

In this first window, we have only two buttons. Always after setting up the objects in 3D space and before starting to use any other features of the addon press the `Save Transform` button, that way if something will go wrong you can always remove all augmentation using the `Restore Transform` button.

PANDA Load from file

This window is meant to simplify the process of tuning already ongoing projects, you need to navigate to the JSON file generated in this addon and press the `Augment from JSON` button. That will augment the objects the same way as it was done when saving the JSON file (same random ranges, not exactly the same results). Keep in mind that the blender file has to be prepared exactly the same way for it to work.

PANDA Augmentation

This is the biggest part of this addon and it contains two sections:

Augment Environment

Augment Data

In the Augment Environment section, you can set the settings that control the amount of randomness in light augmentation. Values in the first row control the Z rotation variation and Z position variation of the whole lamp assembly and jitter controls the random movement of individual lamps in all directions. In the second-row Lamps, strength and color temperature variation can be set. Third row: Frames value, control how many frames will be augmented (you should set it first to a low number such as 10 to test, later you can set it to as many frames as many pictures are needed for training). The last row contains only the Augment Environment button that executes the selected above settings and augments the environment. You can revert this process using Undo (ctrl+z) or the Restore transform button from the Recover and Save Data window.

In the Augment Data section settings are divided into 3 main rows containing Rotation Variation, Translation Variation and Scale Variation values for each of the three-axis. Lower we have also a number of frames that we want to augment and the selection window of classes we want to augment, augmentation must be performed for each class separately by selecting the correct class and pressing the Augment class button.

PANDA Data Generation

This Windows window has three sections:

Generation Settings

Preview

Generate

Generation settings must be set before using any other tool in that window. That includes the number of Classes to generate labels for (do not count Negative classes), the checkbox for generating also Rotation labels (rotation matrix of an object in addition to normal bounding box in camera space) and Frames to generate the images for.

The Preview section allows for generating a smaller amount of data with a reduced resolution for a quick preview

Generate Section contains buttons to: generate bounding boxes, renders or both at the same time. Additionally, button to export Augmentation and generation settings as JSON file.