

## Creating bounding boxes for ImageNet data

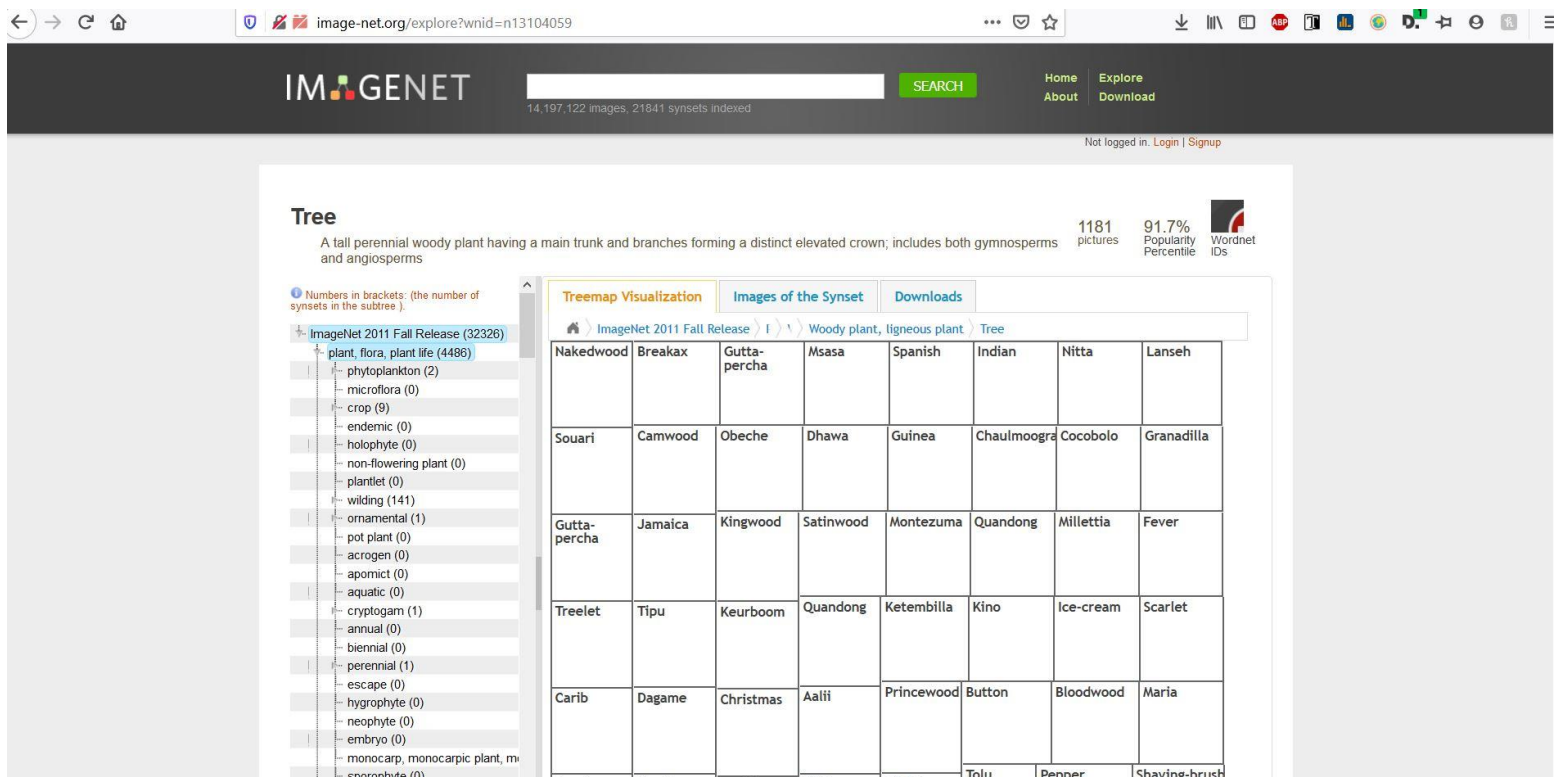
### Access

We have access to annotated ImageNet data available on [image-net.org](http://image-net.org). The credentials for that are:

Username: shubhomb

Access key: "a057c7178f6ba153a61e3e2ec546ea3b32a8d463"

Please do not share these with any external users.



The screenshot shows the ImageNet website interface. The top navigation bar includes the ImageNet logo, a search bar, and links for Home, Explore, About, and Download. The main content area is titled "Tree" and includes a description: "A tall perennial woody plant having a main trunk and branches forming a distinct elevated crown; includes both gymnosperms and angiosperms". It also shows statistics: 1181 pictures, 91.7% Popularity Percentile, and Wordnet IDs. The page features a "Treemap Visualization" section with a grid of images labeled with various tree names. The sidebar on the left shows a hierarchical tree structure of synsets.

ImageNet 2011 Fall Release (32326)							
plant, flora, plant life (4486)							
phytoplankton (2)							
microflora (0)							
crop (9)							
endemic (0)							
holophyte (0)							
non-flowering plant (0)							
plantlet (0)							
wilding (141)							
ornamental (1)							
pot plant (0)							
acrogen (0)							
apomict (0)							
aquatic (0)							
cryptogam (1)							
annual (0)							
biennial (0)							
perennial (1)							
escape (0)							
hygrophyte (0)							
neophyte (0)							
embryo (0)							
monocarp, monocarpic plant, m							
sporophyte (0)							

Treemap Visualization							
Nakedwood	Breakax	Gutta-percha	Msasa	Spanish	Indian	Nitta	Lanseh
Souari	Camwood	Obeche	Dhawa	Guinea	Chaulmoogra	Cocobolo	Granadilla
Gutta-percha	Jamaica	Kingwood	Satinwood	Montezuma	Quandong	Milletia	Fever
Treelet	Tipu	Keurboom	Quandong	Ketembilla	Kino	Ice-cream	Scarlet
Carib	Dagame	Christmas	Aalii	Princewood	Button	Bloodwood	Maria
					Tolu	Pepper	Shaving-brush

### Dataset Overview

The dataset consists of many images, most of which are not useful for Greenstand. However, you can explore at [image-net.org](http://image-net.org) to find images of useful things. Furthermore, to identify the hierarchical relationships between entities, (ex. "Golden Retriever", "dog" "animal"), each of these resolutions is given a unique wnid. Visit [image-net.org](http://image-net.org) for more information.

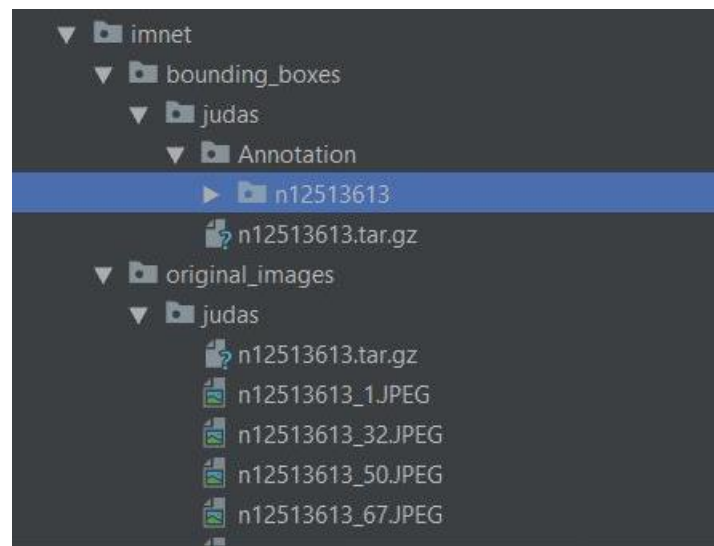
## Current Data Extraction

The `wnid` field is the only thing needed to for data extraction. We have found that searching for images using the search bar at the top of the page yields the resolution of entity that works with the ImageNet API:

- For example, the `wnid` for tree yields unopenable files, but when searching tree in the search bar and download “judas” trees, it works fine

In the Github repo, see the `imnet` directory.

In `download_images_and_boxes.py`, a dictionary called `synsets` contains key-value pairs of names and `wnids`, and downloads images and annotations from ImageNet’s API. Change the `datadir` and `bbdir` arguments to specify the directory where raw images and annotation XML files respectively need to be downloaded. This should automatically untar the downloaded files and create a directory structure like:



The highlighted directory contains the XML annotations for `n12513613`, the Judas tree

The same `datadir` and `bbdir` are used in `annotation_parser.py`. The XML files defined by ImageNet provide metadata about images, including bounding boxes in many (but not all) cases. However, one image can contain images of multiple `wnids`, so we must specify which `wnids` are relevant for our use case, which is done in `names_wanted`.

If the directory structure is kept intact, the function `find_associated_annotation` will find the XML file that matches a given JPEG file, which is done entirely by naming convention. The function `extract_bounding_box` given an annotation XML path and the `names_wanted` parses the XML to find all boxes pertaining to `wnids` specified in

names\_wanted. Then, the `draw_bounding_box_on_image` displays the bounding boxes outputted onto the image. Here are some examples from the Judas tree:

