Blueberry Image Annotation Protocols

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0. Project Background

The overall goal of this project is to develop an image dataset of blueberry fruit to support downstream efforts for blueberry detection and counting. Currently no public blueberry datasets are available yet. To build the dataset requires manually annotating blueberry fruit in images with **bounding boxes**. *Accurate labels and circular boxes, and no missed or wrongly labeled objects are at the heart of image annotation*. Great attention and patience should be exercised during the annotation process, especially for dense, complex scene images.

1. Annotation Software

You are required to use VGG Image Annotator (the latest version 2.0.12) to perform the annotation. Practice the software to be comfortable with annotation operations.

Basically, you need to:

1) create a **region attribute Blueberry** for your **project** (name the project descriptively, e.g., with the name of the image folder shared to you).
2) within the attribute, define your **ID** (**checkbox** type), that is, **object labels or tags**, each of which is for one unique class. Steps 1-2 are to be done only once when you start your project.

3) draw and fine adjust bounding boxes. To ensure bounding box accuracy, you need to **zoom in images** (click the zoom in icon three times or more to better see details) to draw a minimal size rectangle that fits the best the fruit (with minimal background areas included).
4) assign the correspond label to the bounding box (as shown on the right).

Here below are example acceptable and unacceptable annotations:
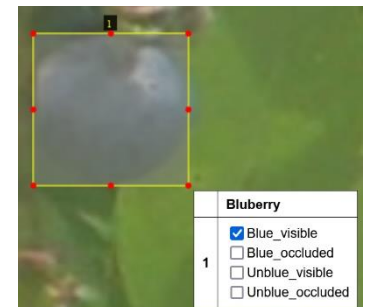
2. Naming Convention

For the blueberry images, you have four defined IDs (labels or tags), as shown above, i.e., "**Blue_visible**" (blue fruit without being occluded by leaves or branches), "**Blue_occluded**" (blue fruit occluded by leaves or branches), "**Unblue_visible**" (fruit not blue and not occluded by leaves or branches), and "**Unblue_occluded**" (fruit not blue and it is occluded by leaves or branches). Strictly and consistently use these IDs for all images.

3. Saving, Export, and Verification

- Keep saving your project from time to time to avoid losing your work in case of computer failure.

- Export your annotation results into a **json file** (with a descriptive filename) (this will be a single file for each project containing annotation results for each image within the project) (we will parse the results to extract annotations for individual images).

- Double check annotation before moving to next image or exporting your project results to make sure: 1) no fruit is missed, 2) no ID is wrongly assigned, and 3) bounding box size is visually acceptable.
- If you identify any errors (e.g., inaccurate, or wrong bounding boxes, missed objects), go back to your annotation image or project and fix these errors.

4. Verification in third-party Software

All uploaded images will be subjected to further quality check and verification in software (e.g., Matlab) to visualize the annotation results before acceptance into the dataset for modeling. Dedicated personnel will be responsible for this, who will assess your annotation quality.