Global wheet detection using SDK

In [1]:
```python
from azure.cognitiveservices.vision.customvision.training import CustomVisionTrainingClient
from azure.cognitiveservices.vision.customvision.prediction import CustomVisionPredictionClient
from azure.cognitiveservices.vision.customvision.training.models import ImageFileCreateBatch, ImageFileCreateEnt
from msrest.authentication import ApiKeyCredentials
import time
```

In [5]:
```python
# Replace with valid values

ENDPOINT = "https://sfsfsvzdf.cognitiveservices.azure.com/"
training_key = "539ca647c77546f184e92222ae02503e"
prediction_key = "4c8b58c38d55427ab3492b7db4da8481"
prediction_resource_id = "/subscriptions/f468ceaa-a610-4b88-9742-2b3e8f4ef76c/resourceGroups/Day2/providers/Micr
```

In [6]:
```python
credentials = ApiKeyCredentials(in_headers={"Training-key": training_key})
trainer = CustomVisionTrainingClient(ENDPOINT, credentials)
prediction_credentials = ApiKeyCredentials(in_headers={"Prediction-key": prediction_key})
predictor = CustomVisionPredictionClient(ENDPOINT, prediction_credentials)
```

In [7]:
```python
# Detect model
publish_iteration_name = "detectModel"

# Find the object detection domain
obj_detection_domain = next(domain for domain in trainer.get_domains() if domain.type == "ObjectDetection" and c

# Create a new project
print ("Creating project...")
project = trainer.create_project("My Detection Project", domain_id=obj_detection_domain.id)
```

```
Creating project...
```

In [8]:
```python
# Make two tags in the new project
wheathead_tag = trainer.create_tag(project.id, "wheathead")
no_wheathead_tag = trainer.create_tag(project.id, "no_wheathead")
```

In [27]:
```python
import cv2
import matplotlib.pyplot as plt
image=cv2.imread(r"C:\Users\Jaswanth Reddy\Desktop\Image dataset\api_weed\weed_yes\wheated_1.jpg")
print(image.shape)
```

```
(1024, 1024, 3)
```

In [30]:
```python
def plot_box(image,box):
    nor_box=[]
    h,w=image.shape[0],image.shape[1]
    nor_box.append(box[0]/w)
    nor_box.append(box[1]/h)
    nor_box.append((box[2]-box[0])/w)
    nor_box.append((box[3]-box[1])/h)
    return nor_box
```

In [51]:
```python
import cv2
import matplotlib.pyplot as plt
image=cv2.imread(r"C:\Users\Jaswanth Reddy\Desktop\Image dataset\api_weed\weed_yes\wheated_20.jpg")
print(plot_box(image,[184.74,357.15,369.79,515.17]))
```

```
[0.18041015625, 0.348779296875, 0.180712890625, 0.15431640624999998]
```

In [54]:
```python
wheathead_image_regions ={
    'wheated_1':[0.325625, 0.0848828125, 0.05864257812500001, 0.13272460937500002],
    'wheated_2':[0.236123046875, 0.5416796875, 0.10184570312499999, 0.13580078125000006],
    'wheated_3':[0.1851953125, 0.67439453125, 0.185185546875, 0.18672851562499992],
    'wheated_4':[0.351865234375, 0.6759375, 0.14505859375000002, 0.20987304687500008],
    'wheated_5':[0.18349609375, 0.110498046875, 0.200771484375, 0.600927734375],
    'wheated_6':[0.431181640625, 0.23673828125, 0.189814453125, 0.31172851562500004],
    'wheated_7':[0.354951171875, 0.541005859375, 0.15740234374999995, -0.03328125000000004],
    'wheated_8':[0.154326171875, 0.04939453125, 0.08951171875, 0.222216796875],
    'wheated_9':[0.419765625, 0.17130859375, 0.10801757812500007, 0.322529296875],
    'wheated_10':[0.234580078125, 0.0787109375, 0.2407421875, 0.1219140625],
    'wheated_11':[0.137353515625, 0.137353515625, 0.14660156249999998, 0.12654296875],
    'wheated_12':[0.853408203125, 0.399697265625, 0.11264648437500002, 0.33157226562500003],
    'wheated_13':[0.18365234375, 0.762353515625, 0.16975585937499998, 0.189814453125],
    'wheated_14':[0.1913671875, 0.4228515625, 0.165126953125, 0.07715820312499999],
    'wheated_15':[0.18828125, 0.597236328125, 0.14351562499999998, 0.061728515624999925],
    'wheated_16':[0.395068359375, 0.69908203125, 0.07716796874999998, 0.14197265625],
    'wheated_17':[0.42130859375, 0.294765625, 0.16357421874999994, 0.06635742187500004],
    'wheated_18':[0.135810546875, 0.358037109375, 0.067900390625, 0.10883789062499999],
    'wheated_19':[0.66205078125, 0.1605078125, 0.1512304687499999, 0.070986328125],
    'wheated_20':[0.18041015625, 0.348779296875, 0.180712890625, 0.15431640624999998]

}

no_wheathead_image_regions = {
    "no_wheathead_1": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_2": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_3": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_4": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_5": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_6": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_7": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_8": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_9": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_10": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_11": [ 0.0, 0.0, 0.0, 0.0 ],
    "no_wheathead_12": [ 0.0, 0.0, 0.0, 0.0],
    "no_wheathead_13": [ 0.0, 0.0, 0.0, 0.0],
    "no_wheathead_14": [ 0.0, 0.0, 0.0, 0.0],
    "no_wheathead_15": [ 0.0, 0.0, 0.0, 0.0],
    "no_wheathead_16": [ 0.0, 0.0, 0.0, 0.0],
    "no_wheathead_17": [ 0.0, 0.0, 0.0, 0.0],
```

```
        "no_wheathead_18": [0.0, 0.0, 0.0, 0.0],
        "no_wheathead_19": [ 0.0, 0.0, 0.0, 0.0],
        "no_wheathead_20": [ 0.0, 0.0, 0.0, 0.0],
        "no_wheathead_21": [ 0.0, 0.0, 0.0, 0.0],
        "no_wheathead_22": [ 0.0, 0.0, 0.0, 0.0]
    }
```

In [55]:
```python
# Update this with the path to where you downloaded the images.
base_image_location = "C:/Users/Jaswanth Reddy/Desktop/Image dataset/api_weed/"

# Go through the data table above and create the images
print ("Adding images...")
tagged_images_with_regions = []

for file_name in wheathead_image_regions.keys():
    x,y,w,h = wheathead_image_regions[file_name]
    regions = [ Region(tag_id=wheathead_tag.id, left=x,top=y,width=w,height=h) ]

    with open(base_image_location + "Weed_yes/" + file_name+".jpg", mode="rb") as image_contents:
        tagged_images_with_regions.append(ImageFileCreateEntry(name=file_name, contents=image_contents.read(), r

for file_name in no_wheathead_image_regions.keys():
    x,y,w,h = no_wheathead_image_regions[file_name]
    regions = [ Region(tag_id=no_wheathead_tag.id, left=x,top=y,width=w,height=h) ]

    with open(base_image_location + "weed_no/" + file_name + ".jpg", mode="rb") as image_contents:
        tagged_images_with_regions.append(ImageFileCreateEntry(name=file_name, contents=image_contents.read(), r

upload_result = trainer.create_images_from_files(project.id, ImageFileCreateBatch(images=tagged_images_with_regi
if not upload_result.is_batch_successful:
    print("Image batch upload failed.")
    for image in upload_result.images:
        print("Image status: ", image.status)
    exit(-1)
```

```
Adding images...
Image batch upload failed.
Image status:  OKDuplicate
Image status:  OKDuplicate
Image status:  OKDuplicate
Image status:  OKDuplicate
Image status:  OKDuplicate
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Image status:  OKDuplicate
```

```
Image status:  OKDuplicate
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Image status:  OKDuplicate
Image status:  OKDuplicate
```

In [56]:
```python
print ("Training...")
iteration = trainer.train_project(project.id)
while (iteration.status != "Completed"):
    iteration = trainer.get_iteration(project.id, iteration.id)
    print ("Training status: " + iteration.status)
    time.sleep(1)
```

Training...

```
---------------------------------------------------------------------------
CustomVisionErrorException                Traceback (most recent call last)
<ipython-input-56-b37a002df2c9> in <module>
      1 print ("Training...")
----> 2 iteration = trainer.train_project(project.id)
      3 while (iteration.status != "Completed"):
      4     iteration = trainer.get_iteration(project.id, iteration.id)
      5     print ("Training status: " + iteration.status)

D:\Python\lib\site-packages\azure\cognitiveservices\vision\customvision\training\operations\_custom_vision_tra
ining_client_operations.py in train_project(self, project_id, training_type, reserved_budget_in_hours, force_t
rain, notification_email_address, selected_tags, custom_base_model_info, custom_headers, raw, **operation_conf
ig)
   3272
   3273         if response.status_code not in [200]:
-> 3274             raise models.CustomVisionErrorException(self._deserialize, response)
   3275
   3276         deserialized = None

CustomVisionErrorException: Nothing changed since last training
```

In [16]:
```python
# The iteration is now trained. Publish it to the project endpoint
trainer.publish_iteration(project.id, iteration.id, publish_iteration_name, prediction_resource_id)
print ("Done!")
```

Done!

In [17]:
```python
# Predicting an image

with open(base_image_location + "/weed_no/no_wheathead_10.jpg", mode="rb") as test_data:
    results = predictor.detect_image(project.id, publish_iteration_name, test_data)

# Display the results.
for prediction in results.predictions:
    print("\t" + prediction.tag_name + ": {0:.2f}% bbox.left = {1:.2f}, bbox.top = {2:.2f}, bbox.width = {3:.2f}
```

```
	wheathead: 1.70% bbox.left = 0.71, bbox.top = 0.49, bbox.width = 0.05, bbox.height = 0.05
	no_wheathead: 1.29% bbox.left = 0.79, bbox.top = 0.53, bbox.width = 0.04, bbox.height = 0.06
	wheathead: 1.20% bbox.left = 0.79, bbox.top = 0.53, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 1.19% bbox.left = 0.42, bbox.top = 0.54, bbox.width = 0.04, bbox.height = 0.04
	no_wheathead: 1.07% bbox.left = 0.71, bbox.top = 0.49, bbox.width = 0.05, bbox.height = 0.05
	no_wheathead: 0.98% bbox.left = 0.42, bbox.top = 0.66, bbox.width = 0.04, bbox.height = 0.05
	no_wheathead: 0.87% bbox.left = 0.50, bbox.top = 0.62, bbox.width = 0.04, bbox.height = 0.06
	wheathead: 0.81% bbox.left = 0.59, bbox.top = 0.91, bbox.width = 0.04, bbox.height = 0.05
	no_wheathead: 0.79% bbox.left = 0.79, bbox.top = 0.62, bbox.width = 0.05, bbox.height = 0.05
	wheathead: 0.77% bbox.left = 0.83, bbox.top = 0.95, bbox.width = 0.06, bbox.height = 0.05
	no_wheathead: 0.73% bbox.left = 0.58, bbox.top = 0.41, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.71% bbox.left = 0.00, bbox.top = 0.62, bbox.width = 0.24, bbox.height = 0.38
	no_wheathead: 0.71% bbox.left = 0.83, bbox.top = 0.62, bbox.width = 0.05, bbox.height = 0.04
	no_wheathead: 0.70% bbox.left = 0.50, bbox.top = 0.58, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.69% bbox.left = 0.62, bbox.top = 0.68, bbox.width = 0.15, bbox.height = 0.18
	no_wheathead: 0.67% bbox.left = 0.13, bbox.top = 0.74, bbox.width = 0.28, bbox.height = 0.26
	no_wheathead: 0.67% bbox.left = 0.70, bbox.top = 0.63, bbox.width = 0.14, bbox.height = 0.19
	no_wheathead: 0.67% bbox.left = 0.46, bbox.top = 0.28, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.65% bbox.left = 0.45, bbox.top = 0.56, bbox.width = 0.13, bbox.height = 0.17
	wheathead: 0.63% bbox.left = 0.75, bbox.top = 0.79, bbox.width = 0.05, bbox.height = 0.04
	no_wheathead: 0.59% bbox.left = 0.42, bbox.top = 0.58, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.59% bbox.left = 0.62, bbox.top = 0.41, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.58% bbox.left = 0.59, bbox.top = 0.37, bbox.width = 0.28, bbox.height = 0.47
	no_wheathead: 0.56% bbox.left = 0.20, bbox.top = 0.88, bbox.width = 0.14, bbox.height = 0.12
	no_wheathead: 0.55% bbox.left = 0.63, bbox.top = 0.46, bbox.width = 0.04, bbox.height = 0.05
	no_wheathead: 0.55% bbox.left = 0.46, bbox.top = 0.62, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.53% bbox.left = 0.63, bbox.top = 0.49, bbox.width = 0.04, bbox.height = 0.05
	no_wheathead: 0.53% bbox.left = 0.79, bbox.top = 0.20, bbox.width = 0.04, bbox.height = 0.06
	no_wheathead: 0.53% bbox.left = 0.70, bbox.top = 0.57, bbox.width = 0.30, bbox.height = 0.43
	no_wheathead: 0.52% bbox.left = 0.16, bbox.top = 0.83, bbox.width = 0.38, bbox.height = 0.17
	no_wheathead: 0.52% bbox.left = 0.75, bbox.top = 0.50, bbox.width = 0.04, bbox.height = 0.05
	no_wheathead: 0.52% bbox.left = 0.13, bbox.top = 0.71, bbox.width = 0.04, bbox.height = 0.05
```

```
        wheathead: 0.52% bbox.left = 0.58, bbox.top = 0.84, bbox.width = 0.04, bbox.height = 0.04
        no_wheathead: 0.51% bbox.left = 0.16, bbox.top = 0.79, bbox.width = 0.04, bbox.height = 0.05
        no_wheathead: 0.50% bbox.left = 0.29, bbox.top = 0.84, bbox.width = 0.13, bbox.height = 0.16
```

In [18]:
```python
# Predicting an image

with open(base_image_location + "/weed_yes/10.jpg", mode="rb") as test_data:
    results = predictor.detect_image(project.id, publish_iteration_name, test_data)

# Display the results.
for prediction in results.predictions:
    print("\t" + prediction.tag_name + ": {0:.2f}% bbox.left = {1:.2f}, bbox.top = {2:.2f}, bbox.width = {3:.2f}
```

```
        wheathead: 10.51% bbox.left = 0.96, bbox.top = 0.04, bbox.width = 0.04, bbox.height = 0.05
        wheathead: 6.26% bbox.left = 0.71, bbox.top = 0.40, bbox.width = 0.04, bbox.height = 0.07
        wheathead: 4.53% bbox.left = 0.75, bbox.top = 0.00, bbox.width = 0.05, bbox.height = 0.06
        wheathead: 4.22% bbox.left = 0.97, bbox.top = 0.16, bbox.width = 0.03, bbox.height = 0.05
        wheathead: 4.03% bbox.left = 0.16, bbox.top = 0.03, bbox.width = 0.06, bbox.height = 0.05
        wheathead: 3.77% bbox.left = 0.00, bbox.top = 0.62, bbox.width = 0.04, bbox.height = 0.06
        wheathead: 3.63% bbox.left = 0.96, bbox.top = 0.13, bbox.width = 0.03, bbox.height = 0.05
        wheathead: 3.38% bbox.left = 0.97, bbox.top = 0.20, bbox.width = 0.03, bbox.height = 0.04
        wheathead: 3.27% bbox.left = 0.96, bbox.top = 0.00, bbox.width = 0.04, bbox.height = 0.04
        wheathead: 3.18% bbox.left = 0.00, bbox.top = 0.74, bbox.width = 0.04, bbox.height = 0.06
        wheathead: 3.06% bbox.left = 0.07, bbox.top = 0.00, bbox.width = 0.16, bbox.height = 0.10
        wheathead: 2.81% bbox.left = 0.79, bbox.top = 0.53, bbox.width = 0.04, bbox.height = 0.07
        wheathead: 2.75% bbox.left = 0.13, bbox.top = 0.00, bbox.width = 0.04, bbox.height = 0.03
        wheathead: 2.69% bbox.left = 0.92, bbox.top = 0.00, bbox.width = 0.05, bbox.height = 0.04
        wheathead: 2.58% bbox.left = 0.33, bbox.top = 0.04, bbox.width = 0.05, bbox.height = 0.05
        wheathead: 2.49% bbox.left = 0.00, bbox.top = 0.12, bbox.width = 0.04, bbox.height = 0.04
        wheathead: 2.43% bbox.left = 0.20, bbox.top = 0.04, bbox.width = 0.05, bbox.height = 0.05
        wheathead: 2.32% bbox.left = 0.45, bbox.top = 0.00, bbox.width = 0.14, bbox.height = 0.14
        wheathead: 2.21% bbox.left = 0.00, bbox.top = 0.00, bbox.width = 0.05, bbox.height = 0.05
        wheathead: 2.21% bbox.left = 0.92, bbox.top = 0.04, bbox.width = 0.04, bbox.height = 0.04
```

In [ ]: