Visualise pointlabels for the SEAVIEW dataset

Below you find how to plot the pointlabels of the SEAVIEW dataset over the images to get a better understanding of how these images are labeled. In practise marine biologists will spend hours annotating these randomly generated point labels by hand. They have to fill in the species and functional group of each point.

```
import pandas as pd
from google.colab import drive
import os
from PIL import Image
import matplotlib.pyplot as plt
import numpy as np
```

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```
#Change ROOT_DIR to the location where you have short cutted the dataset to
ROOT_DIR = "/content/drive/MyDrive/Data Challenge 3 - JBG060 AY2526/01_data/benthic_datasets/point_labels/SEAVIEW"
IMAGES_DIR = f"{ROOT_DIR}/ATL"
POINTS_DIR = f"{ROOT_DIR}/tabular-data/annotations_ATL.csv"
```

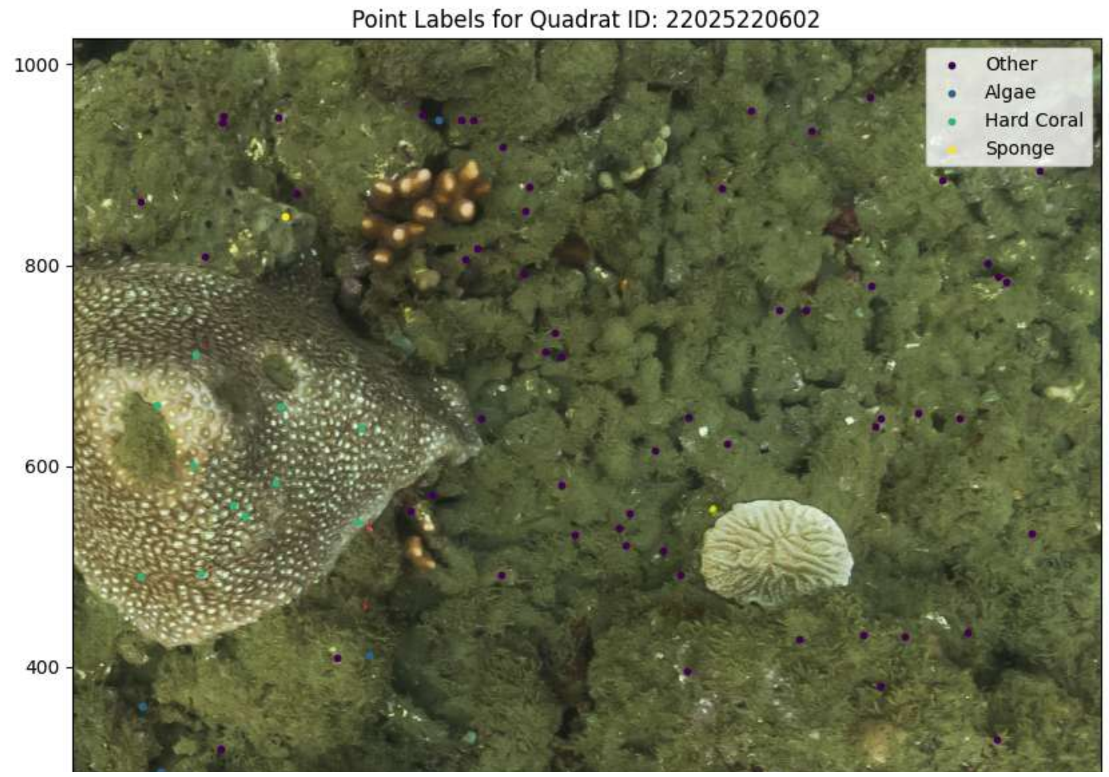
```
points_df = pd.read_csv(POINTS_DIR)
points_df
```

	quadratid	y	x	label_name	label	func_group	method	data_set
0	17001738002	180	183	Fish	FISH	Other	random	test
1	17001738002	199	162	CCA	CCA	Algae	random	test
2	17001738002	197	160	CCA	CCA	Algae	random	test
3	17001738002	88	561	Turf	Turf	Algae	random	test
4	17001738002	195	714	Ocomplex	OCOM	Hard Coral	random	test
...	...	...	...	...	...	...	...	...
92895	21011130002	619	738	Pseudodiploria bleached	PSEU-BL	Hard Coral	target	train
92896	21011130002	535	751	Pseudodiploria bleached	PSEU-BL	Hard Coral	target	train
92897	21011130002	458	555	Pseudodiploria bleached	PSEU-BL	Hard Coral	target	train
92898	21011130002	409	539	Pseudodiploria bleached	PSEU-BL	Hard Coral	target	train
92899	21011130002	446	697	Pseudodiploria bleached	PSEU-BL	Hard Coral	target	train

92900 rows × 8 columns

```
def load_points_data(points_file_path):
    points_df = pd.read_csv(points_file_path)
    points_df['quadratid'] = points_df['quadratid'].astype(str)
    return points_df

def find_images_with_points(images_directory, points_df):
    image_quadrat_ids = [os.path.splitext(f)[0] for f in os.listdir(images_directory) if f.endswith('.jpg')]
    points_quadrat_ids = points_df['quadratid'].unique().tolist()
    quadrat_ids_with_points = list(set(image_quadrat_ids) & set(points_quadrat_ids))
    return quadrat_ids_with_points

def filter_points_for_image(quadrat_id, points_df):
    image_points_df = points_df[points_df['quadratid'] == quadrat_id].copy()
    return image_points_df

def create_color_map(image_points_df):
    unique_func_groups = image_points_df['func_group'].unique()
    colors = plt.cm.get_cmap('viridis', len(unique_func_groups))
    color_map = {group: colors(i) for i, group in enumerate(unique_func_groups)}
    return color_map

def visualize_image_with_points(image_path, image_points_df, color_map):
    try:
        img = Image.open(image_path)
        fig, ax = plt.figure(figsize=(10, 10)), plt.gca()
        ax.imshow(img)

        for func_group in image_points_df['func_group'].unique():
            group_points = image_points_df[image_points_df['func_group'] == func_group]
            ax.scatter(group_points['x'], group_points['y'], color=color_map[func_group], label=func_group, s=10)

        ax.set_title(f'Point Labels for Quadrat ID: {os.path.splitext(os.path.basename(image_path))[0]}')
        ax.invert_yaxis()
        ax.legend()
        plt.show()
    except FileNotFoundError:
        print(f"Error: Image file not found at {image_path}")
    except Exception as e:
        print(f"An error occurred while visualizing the image: {e}")



# Load data
all_points_df = load_points_data(POINTS_DIR)

# Find images with points
quadrat_ids_with_associated_points = find_images_with_points(IMAGES_DIR, all_points_df)

# Select an image with points (using the first one from the list)
selected_quadrat_id_for_visualization = quadrat_ids_with_associated_points[9]

# Construct the full path to the selected image file
selected_image_filepath = os.path.join(IMAGES_DIR, f"{selected_quadrat_id_for_visualization}.jpg")

# Filter point labels for the selected image
points_for_selected_image_df = filter_points_for_image(selected_quadrat_id_for_visualization, all_points_df)

# Create a color mapping
functional_group_color_map = create_color_map(points_for_selected_image_df)

# Visualize image with colored points
visualize_image_with_points(selected_image_filepath, points_for_selected_image_df, functional_group_color_map)
```

```
/tmp/ipython-input-3976200795.py:18: MatplotlibDeprecationWarning: The get_cmap function was deprecated in Matplotlib 3.7 and will be re
  colors = plt.cm.get_cmap('viridis', len(unique_func_groups))
```


Point Labels for Quadrat ID: 22025220602
Other
Algae
Hard Coral
Sponge