Carbon Neutral

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Concept

-We can make a dataset to detect cars and trees in a picture within a specific area (our current example is NYC)

-We plan to then use a formula we have created that uses how much average C02 is created for trees vs C02 is created for cars

Concept

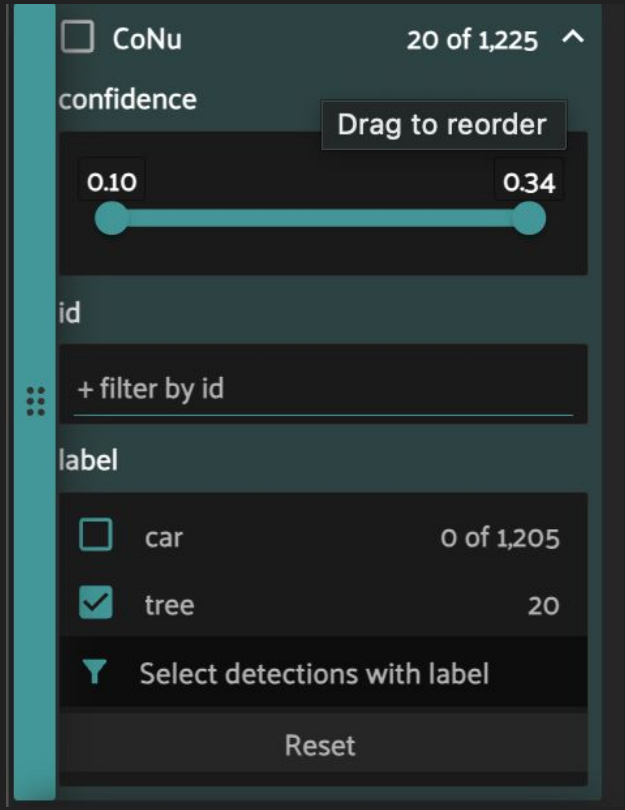
-Most datasets are too broad so we want our system to correctly calculate how many trees or cars in each photo of the area

-Calculate the dataset of cars needed to convert to electric or trees planted in order to get effectively to carbon neutral within an area in a given time

-We wanted to focus on an environmental issue that we deal with everyday in our daily lives - global warming - due to carbon emissions

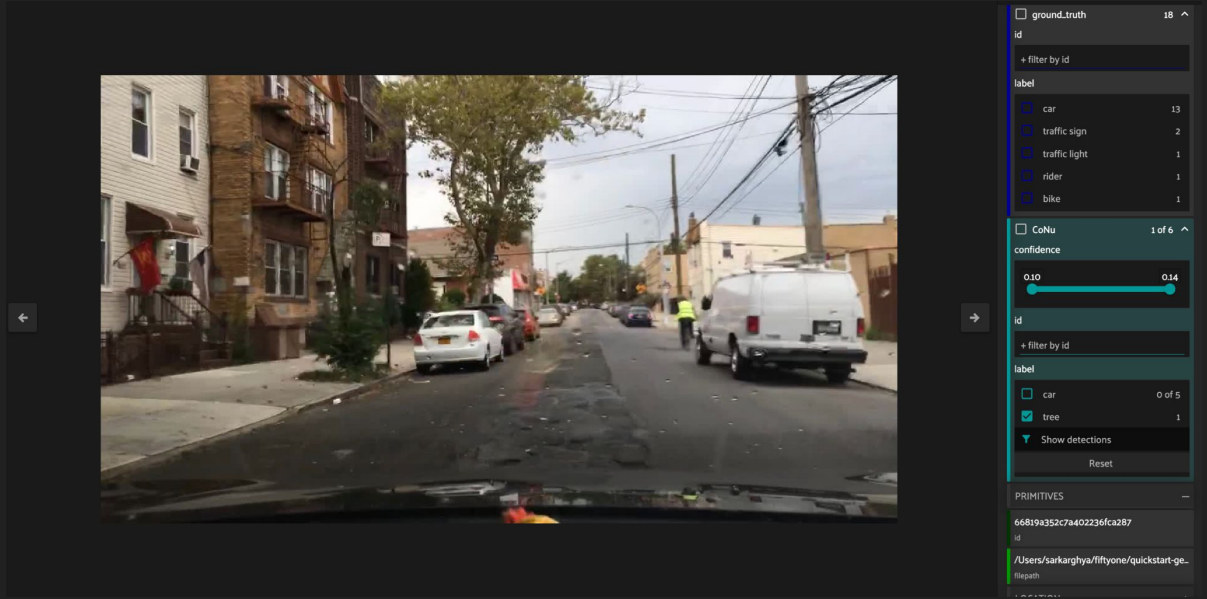
Current Problems

-Only 20 photos total for tree so it is inaccurate meanwhile there are 1200 photos of cars



Current Problems

-Trees currently detecting only 1 per photo



Current Problems

-The emissions of carbon dioxide is different based off types of trees

Current Code for Geo Data Set

```
MANHATTAN = [
    [
        [-73.949701, 40.834487],
        [-73.896611, 40.815076],
        [-73.998083, 40.696534],
        [-74.031751, 40.715273],
        [-73.949701, 40.834487],
    ]
]

dataset = foz.load_zoo_dataset("quickstart-geo")

view = dataset.geo_within(MANHATTAN)
```

Current Code

```
import fiftyone as fo
import fiftyone.zoo as foz
dataset =  foz.load_zoo_dataset("quickstart-geo")

model = foz.load_zoo_model(
    "zero-shot-detection-transformer-torch",
    name_or_path="google/owlvit-base-patch32",  # HF model name or path
    classes=["tree", "car"]
)

dataset.apply_model(model, label_field="carbonObj", confidence_thresh=0.05)
```

Previous Code (with YOLO)

```
import fiftyone as fo
import fiftyone.zoo as foz
from ultralytics import YOLO

dataset = foz.load_zoo_dataset("quickstart")
session = fo.launch_app(dataset, auto=False)
model = YOLO("yolov8s.pt")
dataset.apply_model(model, label_field="boxes")
```

Challenges We Overcame

-YOLO only detected cars - so we used a hugging face package called OWL-VIT and we pip3 installed transformers for Hugging Face

-Jupyter uses constant updates for fiftyone so we effectively used that within VS Code

Possible Solutions to Edge Cases

-Add more tree classification within the datasets within the model that makes it more specific to each tree to then properly collect the carbon dioxide emitted per tree

-Make cars more specific to each type of car to properly collect carbon dioxide emission information (for instance trucks emit different pollution than a Sedan)

-Create a proper formula based off of the carbon dioxide emissions to reach carbon neutral to then tell the user how many trees of which classifications need to be planted or cars to be replaced with electric cars

-Have better detection of cars per frame per second with a better package

We Can’t Wait to Continue to Work On “Carbon Neutral”