

Quadruped Animal Annotation for 3D Model Generation

Henry Bobeck, Nick Walker, Emily Sommers

Indiana University UROC Fall 2020 Research Project

Annotating a dataset of quadruped animal images for use in 3D model generation with machine learning

Purpose

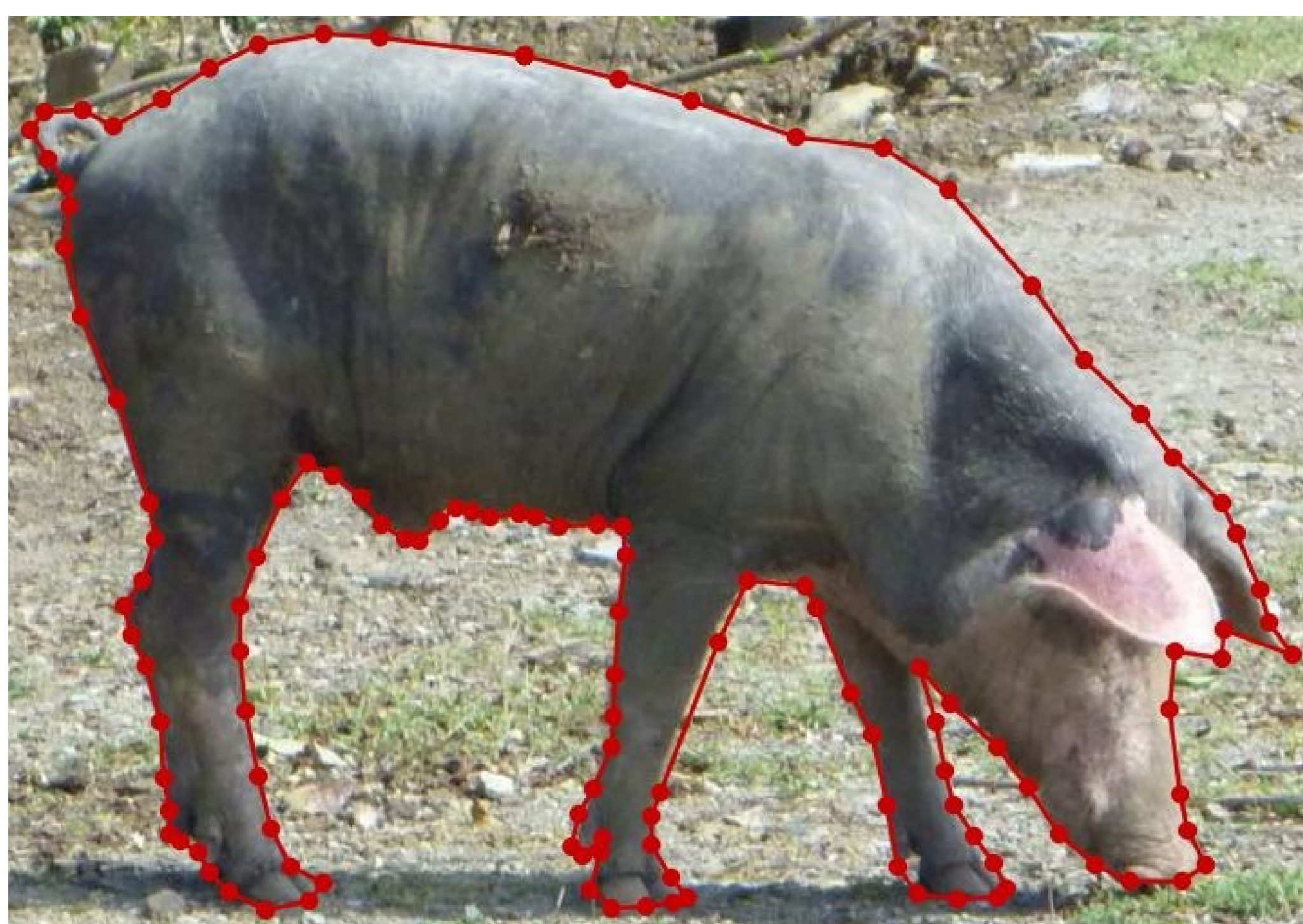
The end goal of the overarching project is to develop a machine learning solution to generate 3D models from still images of quadruped animals.

By assisting in labeling a training dataset of 150+ images per animal, we are providing the input for the model to learn how to segment each animal.

Challenges

Each segmentation mask has to be manually annotated, which can prove challenging because some of the images have parts of the animal obstructed by plants, etc.

For example, some animals may blend in to the background, which can prove difficult for even just a human to label correctly.



Methodology

All labeling work is done through a small program called labelme.

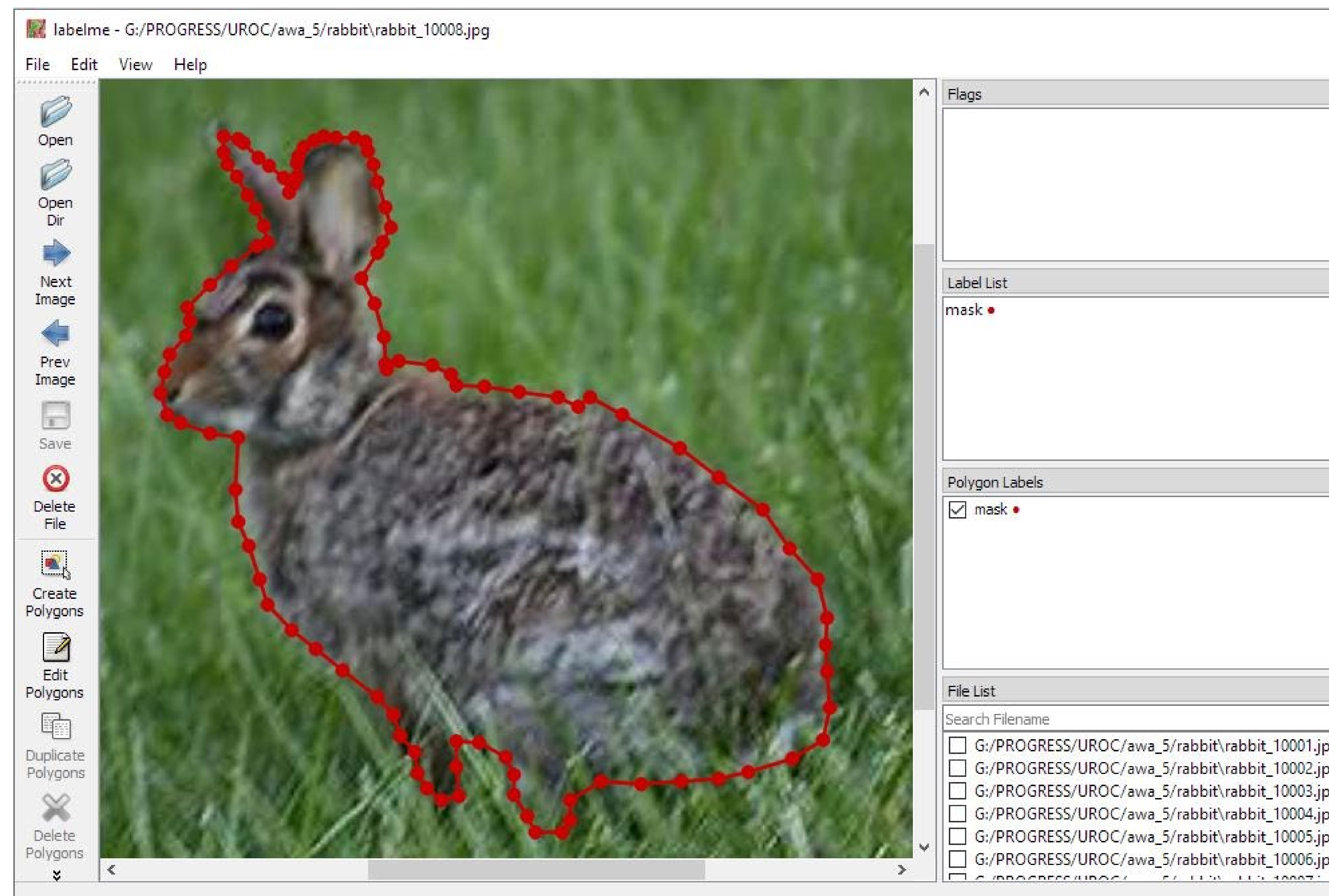
Labelme is an open-source Python-based tool which streamlines the process of manual image labeling, creating .json files for each individual mask on the image.

By eventually interpreting these .json files for training purposes, we are providing the knowledge the learning algorithm needs to create an effective machine learning model.

(1) Select an image where there is only one animal in the image and at least 80% of the animal is visible

(2) Annotate the image by creating a polygon around the silhouette of the animal, being as accurate as possible and creating multiple masks if necessary

(3) Save the annotations as .json files for each image



Progress so far

- Of our team of three, each person was able to annotate roughly 300 images to be used in the training set

Conclusion

By following this image labeling process and recognizing the unforeseen challenges each individual image may provide, we have gained a greater understanding for both the requirements of training a machine learning model and how the model must mirror our own labeling techniques. While we have not been able to implement any solutions from an engineering perspective, the process has given us a greater understanding of the learning process.

