

Practices on Visual Computing II - Student Project

NVIDIA Omniverse

Sept 21, 2022

Project

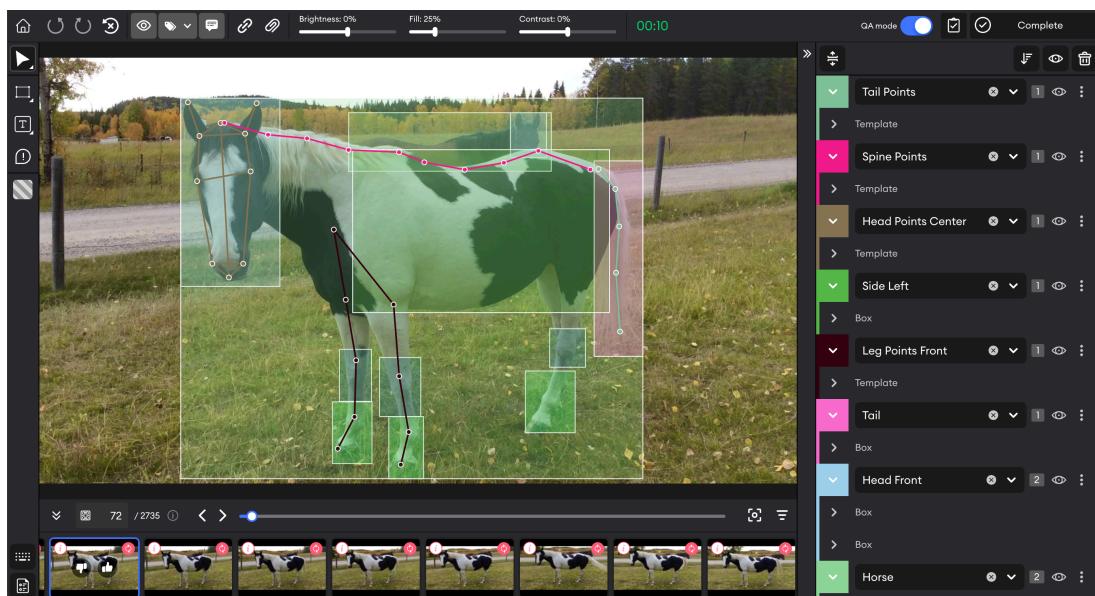
Background

OneCup AI specializes in Computer Vision Face ID for livestock. Our technology can recognize who an animal is, uniquely and individually, by appearance. It is a revolutionary idea that can transform the livestock industry in Canada.



Our AI is BETSY, or Bovine Expert Tracking and Surveillance. She is an AI pipeline that identifies and tracks livestock. In doing so, the records activity, health, nutrition, growth and phenotypes.

An essential part of the process is building up large training datasets. OneCup annotates thousands of images to power BETSY's training.

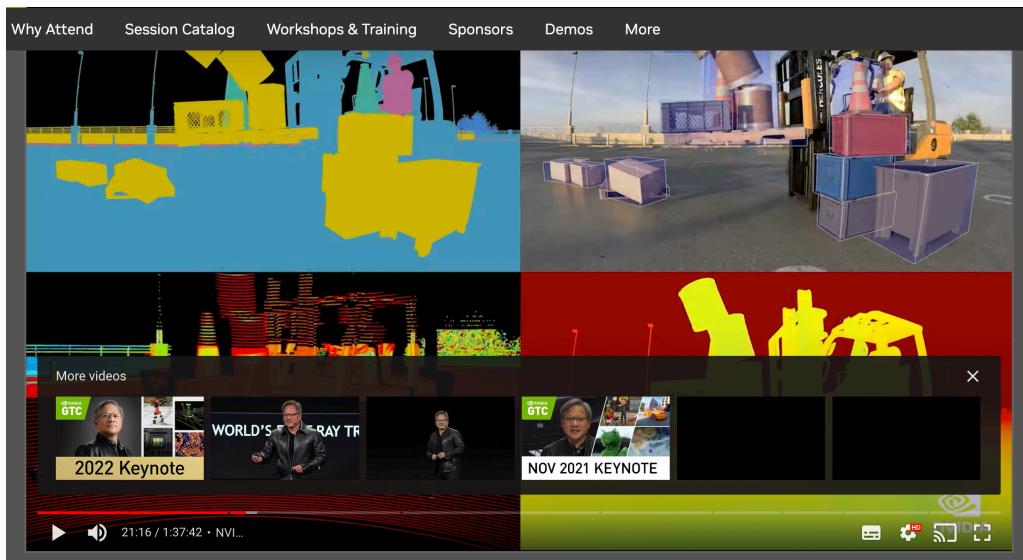


NVIDIA OMNIVerse

In NVIDIA's GTC Keynote this week, the CEO focused heavily on the power of the Omniverse to generate synthetic data for model training. Effectively, NVIDIA can create a digital twin of nearly any environment.

<https://www.nvidia.com/gtc/keynote/>

<https://www.nvidia.com/en-us/omniverse/>



NVIDIA Omniverse

Objectives

OneCup wants to apply the same technology to livestock, wildlife and pets.

The goal is to create a simulated animal environment using Omniverse and extract training data from it. As this is an open-ended project, it will be up to SFU students to determine what and how best to extract data from the simulation into a format usable for training, such as COCO.

In the image above, you can see bounding boxes generated in 3D, masks, depth maps and more.

Tasks

1. Register and install Omniverse locally under an Individual License.

1. <https://www.nvidia.com/en-us/omniverse/download/>

-
2. Learn everything you can about Omniverse in 2 weeks.
 3. Build a scene in Omniverse with animal models provided by OneCup or by NVIDIA
 - A. If possible, use the built-in animations
 - B. It should be a Digital Twin of an outdoor scene
 4. Extract some useful training information for training from the scene. It can be bounding boxes, depth maps, etc into a JSON or COCO format.
 5. Bonus #1: If you can animate a camera around a scene while generating data, all the better.
 6. Bonus #2: See if you can change the texture on an animal procedurally, that is, is there a way to do it in OMNIVerse?

Data

OneCup can provide animal models to place in the environment, based on the standard FBX format.

Resources

You will need to use your own computers for this project, please make sure you have a relatively modern GPU.

Contact

OneCup's primary project contact is :

Geoffrey Shmigelsky, CTO at OneCup AI
geoff@onecup.ai

© 2022 OneCup AI

