A. Appendix

B. Install annolid and Create Conda Environment

B.1. Installing Conda

If you don't have Conda installed on your system, you can install it by following these steps:

Windows:

1. **Download Anaconda Installer:**

    - Go to the Anaconda website: https://www.anaconda.com/products/distribution.
    - Download the appropriate version of Anaconda for Windows (32-bit or 64-bit).

2. **Run the Installer:**

    - Once the installer is downloaded, double-click the executable file to launch the installer.

3. **Follow the Installation Wizard:**

    - Follow the prompts in the installation wizard.
    - Select the installation location and optionally add Anaconda to your PATH environment variable.

4. **Complete the Installation:**

    - Click 'Next' and then 'Install' to begin the installation process.
    - Once installed, you can access Conda via Anaconda Navigator or the Anaconda Prompt.

5. **Verification:**

    - Open Anaconda Prompt from the Start menu.
    - Type `conda --version` and press Enter. This command should display the Conda version installed.

Linux:

1. **Download Anaconda Installer:**

    - Go to the Anaconda website: https://www.anaconda.com/products/distribution.
    - Download the appropriate version of Anaconda for Linux.

2. **Open Terminal:**

    - Open a terminal window on your Linux distribution.

3. **Navigate to the Download Directory:**

    - Use the `cd` command to navigate to the directory where the Anaconda installer was downloaded.

4. **Run the Installer Script:**

    - Use the following command to run the Anaconda installer script:

        ```
        bash Anaconda3-<version>-Linux-x86_64.sh
        ```

        Replace `<version>` with the version number of Anaconda you downloaded.

5. **Follow the Installation Prompts:**

    - Follow the prompts to agree to the license terms, select the installation location, and confirm the installation.

6. **Activate Installation:**

   - After installation, source the `.bashrc` file to activate the changes:

     ```
     source ~/.bashrc
     ```

7. **Verification:**

   - Open a new terminal window.
   - Type `conda --version` and press Enter. This command should display the Conda version installed.

macOS:

1. **Download Anaconda Installer:**

   - Go to the Anaconda website: https://www.anaconda.com/products/distribution.
   - Download the appropriate version of Anaconda for macOS.

2. **Open Terminal:**

   - Launch Terminal from the Applications/Utilities folder or by searching in Spotlight.

3. **Navigate to the Download Directory:**

   - Use the `cd` command to navigate to the directory where the Anaconda installer was downloaded.

4. **Run the Installer Script:**

   - Use the following command to run the Anaconda installer script:

     ```
     bash Anaconda3-<version>-MacOSX-x86_64.sh
     ```

     Replace `<version>` with the version number of Anaconda you downloaded.

5. **Follow the Installation Prompts:**

   - Follow the prompts to agree to the license terms, select the installation location, and confirm the installation.

6. **Activate Installation:**

   - After installation, source the `.bash_profile` file to activate the changes:

     ```
     source ~/.bash_profile
     ```

7. **Verification:**

   - Open a new terminal window.
   - Type `conda --version` and press Enter. This command should display the Conda version installed.

C. Installation of Annolid on MacBook Air M2 Chip

1. Download the Conda installer for macOS from the official Conda website (https://docs.conda.io/en/latest/miniconda.html).

2. Open a terminal window.

3. Navigate to the directory where the Conda installer was downloaded.

4. Run the following command to execute the installer:

```
bash Miniconda3-latest-MacOSX-x86_64.sh
```

5. Follow the prompts to complete the installation. Make sure to agree to the license terms, and choose the installation location.

To install Annolid on your MacBook Air M2 chip, follow these steps:

C.1. Installing Annolid

Once Conda is installed, you can proceed with installing Annolid:

1. Open a terminal window.

2. Check the version of Conda installed by running:

```
conda -V
```

3. Create a new Conda environment for Annolid:

```
conda create -n annolid python=3.11
```

4. Activate the newly created environment:

```
conda activate annolid
```

5. Clone the Annolid repository and its submodules using Git:

```
git clone --recurse-submodules https://github.com/healthonrails/annolid.git
```

6. Change into the Annolid directory:

```
cd annolid
```

7. Install Annolid in editable mode using pip:

```
pip install -e .
```

8. Run Annolid:

```
annolid
```

9. To deactivate the Annolid environment and return to the base environment, run:

```
conda deactivate
```

C.2. Removing Annolid

If you wish to remove the Annolid environment from your system, you can do so using the following command:

```
conda env remove --name annolid
```

This command will remove the Annolid environment and all its associated packages.
To check the list of Conda environments on your system, you can run:

```
conda info --envs
```

D. Installing Conda on Windows 10

1. **Download Anaconda**: Visit the Anaconda download page and download the appropriate installer for Windows.

2. **Run the Installer**: Double-click the downloaded installer to launch the installation process.

3. **Follow the Installation Wizard**: Follow the prompts in the installation wizard, selecting appropriate options. It's recommended to add Anaconda to your system PATH.

4. **Complete Installation**: Once the installation is complete, close the installer.

E. Installing CUDA and PyTorch (if using GPU)

1. **Verify CUDA Version**: Open Command Prompt and run the following command to check the CUDA version:

```
nvidia-smi
```

Ensure that the CUDA version is compatible with the version of PyTorch you intend to install.

2. **Install PyTorch with CUDA support**: If your CUDA version is compatible, you can install PyTorch with CUDA support using Conda. Run the following command:

```
conda install pytorch==2.2.0 torchvision==0.17.0 \
 torchaudio==2.2.0 pytorch-cuda=12.1 -c pytorch -c nvidia
```

Replace the version numbers and CUDA version with your desired versions if necessary.

F. Installing Annolid

1. **Open Command Prompt**: Press Win + R to open the Run dialog, type cmd, and press Enter.

2. **Create a Conda Environment for Annolid**:

```
conda create -n annolid-env python=3.11
```

3. **Activate the Environment**:

```
conda activate annolid-env
```

4. **Clone the Annolid Repository**:

```
git clone --recurse-submodules https://github.com/healthonrails/annolid.git
```

5. **Navigate to the Annolid Directory**:

```
cd annolid
```

6. **Install Annolid Using pip**:

```
pip install -e .
```

7. **Launch Annolid**:

```
annolid
```

8. **Remove the Conda Environment (Optional)**:

```
conda env remove --name annolid-env
```

G. Tips for Installation

- **Environment Management**: Conda allows you to create separate environments for different projects, which helps in managing dependencies.

- **Python Version**: Annolid requires Python 3.11. Make sure to specify the correct Python version when creating the Conda environment.

- **Git Installation**: Before cloning the Annolid repository, make sure you have Git installed on your system.

- **Submodules**: Annolid relies on Git submodules. Use the `--recurse-submodules` flag while cloning the repository to ensure all necessary dependencies are downloaded.

By following these steps, you should be able to install Annolid on your Windows 10 system successfully. Make sure to activate the Conda environment whenever you want to work with Annolid by running `conda activate annolid-env` in the Command Prompt.

H. Installing Annolid on Ubuntu 20.04

H.1. Installing Conda on Ubuntu 20.04

1. **Download Miniconda**: Visit the Miniconda website and download the appropriate installer script for Linux.

2. **Run the Installer Script**: Open a terminal and navigate to the directory where the Miniconda installer script is downloaded. Run the following command to execute the script:

```
bash Miniconda3-latest-Linux-x86_64.sh
```

Follow the prompts in the installer to complete the installation. You may need to close and reopen the terminal after installation. Replace `myenv` with your desired environment name and specify the Python version if necessary.

H.2. Installing CUDA and PyTorch (if using GPU)

1. **Verify CUDA Version**: Open a terminal and run the following command to check the CUDA version:

```
nvidia-smi
```

Ensure that the CUDA version is compatible with the version of PyTorch you intend to install.

2. **Install PyTorch with CUDA support**: If your CUDA version is compatible, you can install PyTorch with CUDA support using Conda. Run the following command:

```
conda install pytorch==2.2.0 torchvision==0.17.0 \
 torchaudio==2.2.0 pytorch-cuda=12.1 -c pytorch -c nvidia
```

Replace the version numbers and CUDA version with your desired versions if necessary.

H.3. Installing Annolid

1. **Open a Terminal**: Press Ctrl + Alt + T to open a terminal window.

2. **Create a Conda Environment for Annolid**:

```
conda create -n annolid-env python=3.11
```

3. **Activate the Environment**:

```
conda activate annolid-env
```

4. **Clone the Annolid Repository**:

```
git clone --recurse-submodules https://github.com/healthonrails/annolid.git
```

5. **Navigate to the Annolid Directory**:

```
cd annolid
```

6. **Install Annolid Using pip**:

```
pip install -e .
```

7. **Launch Annolid**:

```
annolid
```

8. **Remove the Conda Environment (Optional)**:

```
conda env remove --name annolid-env
```

H.4. Tips for Installation

- **Environment Management**: Conda allows you to create separate environments for different projects, which helps in managing dependencies.

- **Python Version**: Annolid requires Python 3.11. Make sure to specify the correct Python version when creating the Conda environment.

- **Git Installation**: Ensure that Git is installed on your Ubuntu system. You can install it using the following command:

```
sudo apt update
sudo apt install git
```

- **Submodules**: Annolid relies on Git submodules. Use the `--recurse-submodules` flag while cloning the repository to ensure all necessary dependencies are downloaded.

By following these steps, you should be able to install Annolid on your Ubuntu 20.04 system successfully. Make sure to activate the Conda environment whenever you want to work with Annolid by running `conda activate annolid-env` in the terminal.

I. Using Annolid: A Step-by-Step Guide

This guide will walk you through using Annolid to track objects in your videos. Each step is designed to be easy to follow, ensuring you get the most out of the software.

I.1. Step 1: Open Your Video and Label Instances

Start by opening Annolid and loading the video you want to work with. You can do this by clicking on the video icon in the toolbar or selecting "Open Video" from the menu.
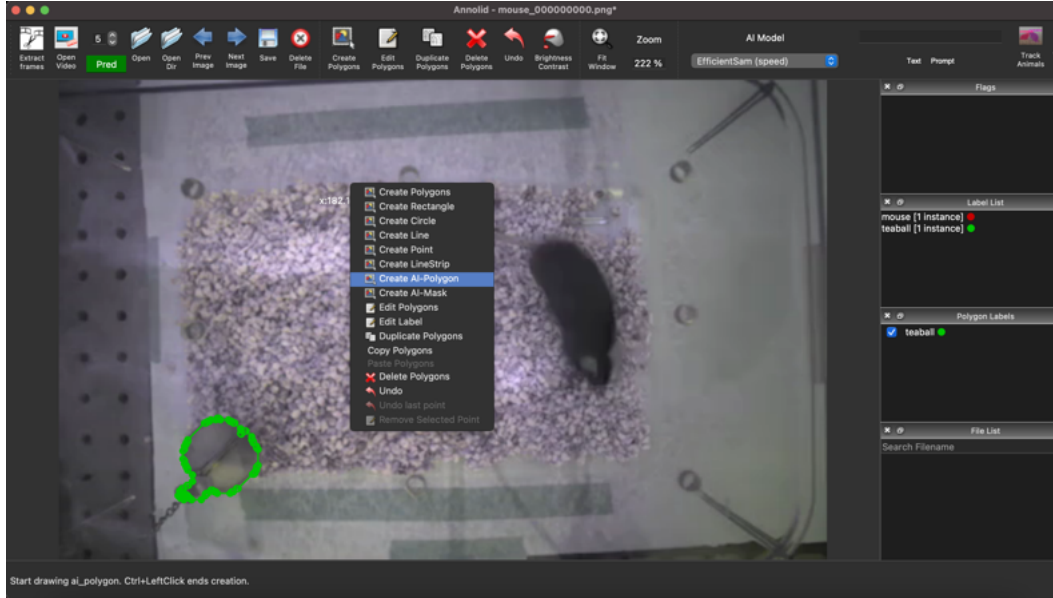

Figure S1. Opening a Video in Annolid

Once the video is loaded, right-click to bring up the menu and choose "AI-Polygon" Click on the object you want to track, and Annolid will generate a polygon around it. You can adjust the polygon as needed and assign a unique identifier to each instance. Clicking plus CMD or CTRL will bring up a pop-up dialog for you to enter the information for each instance. When you are done with labeling, use CMD or CTRL + S or click the save button in the toolbar to save the labeled instances to a JSON file.
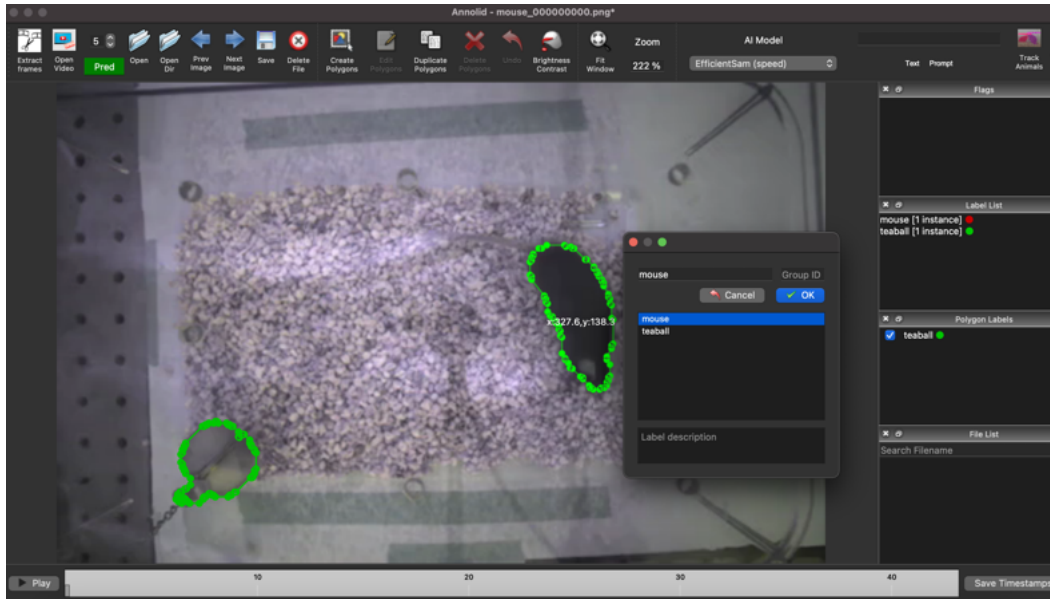
Figure S2. Labeling Instances in Annolid

I.2. Step 2: Predict and Track Based on the First Frame

After labeling the first frame, it's time to start tracking! Click on the "Pred" button to initiate the tracking process. Annolid will run its model inference in the background, and you can start checking the predictions by navigating through the frames.
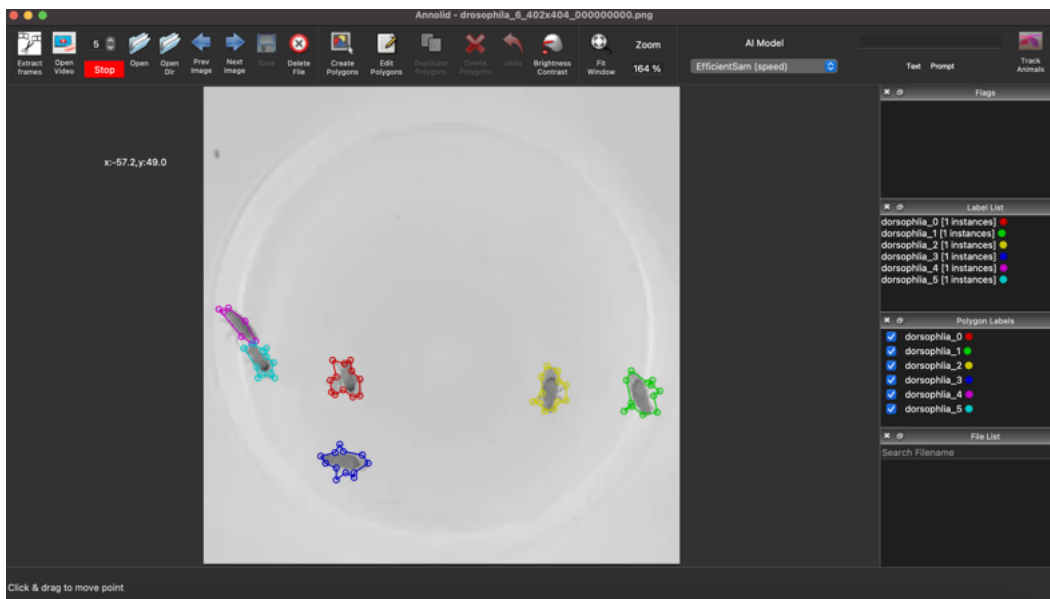

Figure S3. Starting Tracking in Annolid

I.3. Step 3: Stop and Verify the Predictions

If you notice any inaccuracies in the predictions, you can stop the process by clicking the red "Stop" button. Annolid allows you to delete predictions from the next frame onwards and make corrections as needed.
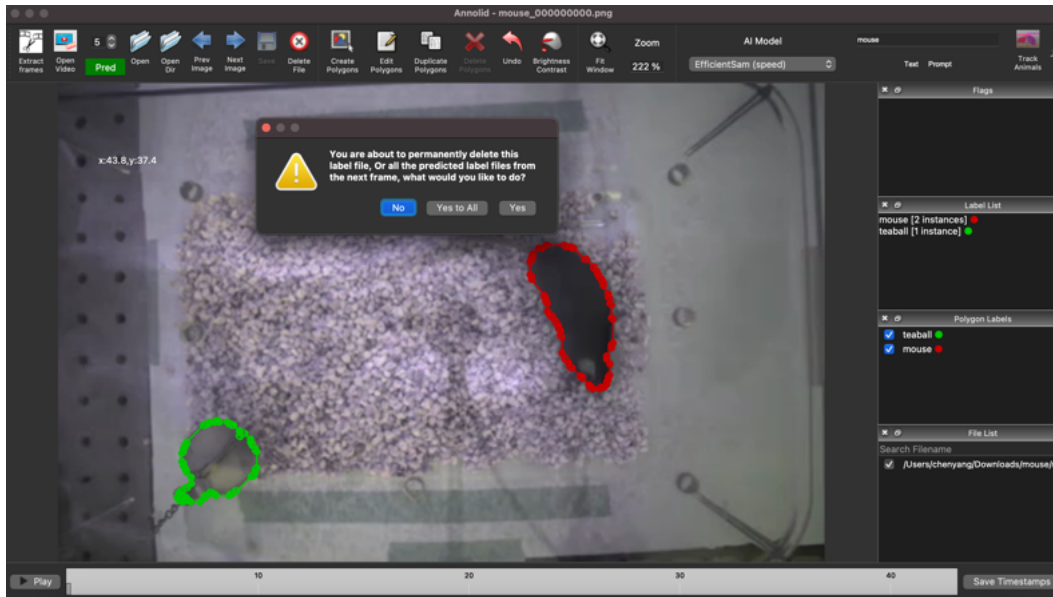
Figure S4. Stopping and Correcting Predictions in Annolid

I.4. Step 4: Finalize the Predictions

Once you're satisfied with the tracking, you can finalize the predictions. Annolid makes it easy to review and complete the tracking task, ensuring accuracy and reliability.
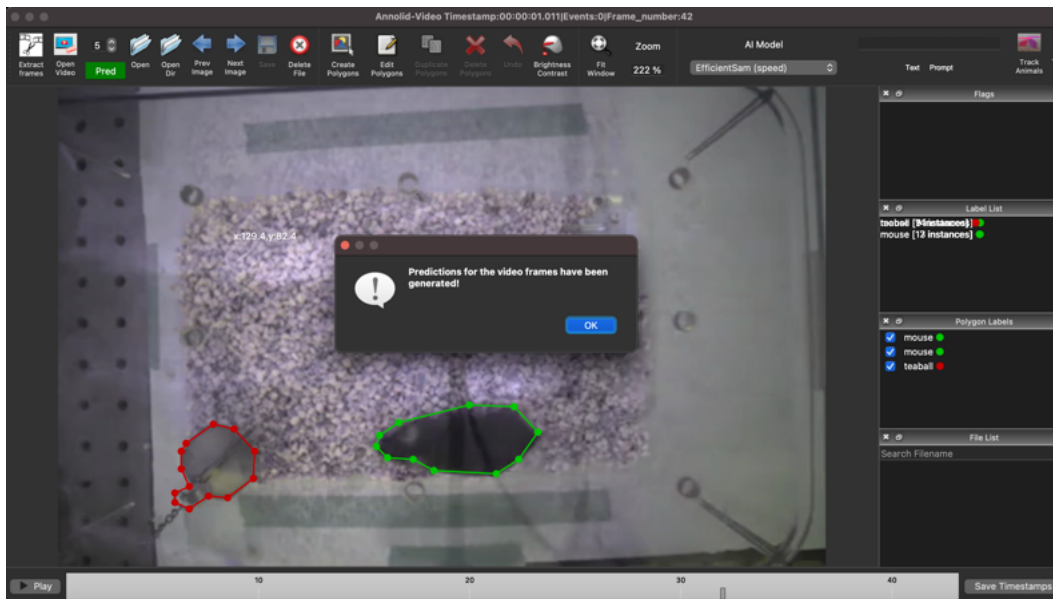

Figure S5. Completing the Tracking Task in Annolid

Congratulations! You've successfully used Annolid to track objects in your videos. Feel free to close the program or continue exploring its other features.