

NEW

AutoTracker Guide

The new version of AutoTracker runs all the same calculations as the previous version while introducing refinements that streamline use, improve processing speed, and minimize errors.

Importing

The new AutoTracker code is now a part of the hilllab Python module. To import the AutoTracker, run the code below.

```
from hilllab.autotracker import *
```

Loading Files

File paths are chosen using the function below. It opens a dialog to select a directory containing videos and another dialog to choose where to save the VRPN files. It also prints a summary so you can verify your selections.

```
video_path, save_path = autotrack_select_paths()
```

The **video_path** and **save_path** arguments returned from this function can then be passed directly into the main AutoTracker function.

Parameter Testing

If you want to test specific parameters before running the AutoTracker on a large batch of videos, use the function below. It performs a short test run to verify that all particles are being correctly detected and linked.

```
autotrack_videos_parameter_test()
```

ARGUMENTS

This function accepts all the same arguments as the standard **autotrack_videos** function, plus an additional **n_frames** (int) argument that specifies how many frames of the video to track.

Autotracking

The AutoTracker runs using the function below, which accepts various arguments to adjust the tracking process.

```
autotrack_videos()
```

ARGUMENTS

- **video_path** (string): the path to the folder containing the videos.
- **save_path** (string): the path to the folder where outputs should be saved.
- **bead_size_pixels** (int, optional): the estimated diameter of the particles in pixels. Default is 21.
- **trajectory_fraction** (float, optional): the minimum fraction of frames in which a particle must appear to be included in the track. A value of 1.0 requires appearance in every frame, while 0.5 requires appearance in half of the frames. Default is 1.0.
- **max_travel_pixels** (int, optional): the maximum distance (in pixels) a particle can move between consecutive frames to be considered the same particle. Defaults to 5.
- **memory** (int, optional): the maximum number of frames during which a particle can vanish, then reappear nearby, and be considered the same particle. Defaults to 0.
- **invert** (bool, optional): when set to true, the AutoTracker searches for dark particles on a light background instead of light particles on a dark one. Defaults to false.
- **performance_mode** ("safe", "slow", or "fast", optional): determines how many CPU processes the AutoTracker can use. A value of "safe" uses most available cores while leaving some for background tasks, "slow" uses half of the cores, and "fast" uses all cores. Default is "safe."

Once running, the AutoTracker saves VRPN files to the selected location. If it encounters certain errors while processing a video, it will skip that video and create a report in the video's folder describing the issue.