Drone-Dataset Tools

The goal of this repository is to make using drone datasets as easy as possible. Therefore, we provide source code in Python for import and visualization. Thus, this source code not only allows to visualize trajectories and thus get an overview, but also serves as a template for your own projects.

Installation

1. Create a new Python environment or select a pre-existing one. This code is tested with Python 3.6, but is very probably compatible with newer releases of Python.
2. Install required packages by
   ```
   pip3 install -r requirements.txt
   ```
3. Copy the csv files of the dataset into the `data` subdirectory.

Importer

tracks_import.py

This module allows to import the tracks, tracks meta info and recording meta info for a single recording (`read_from_csv(tracks_file, tracks_meta_file, recordings_meta_file)`) or for all recordings (`read_all_recordings_from_csv(base_path)`).

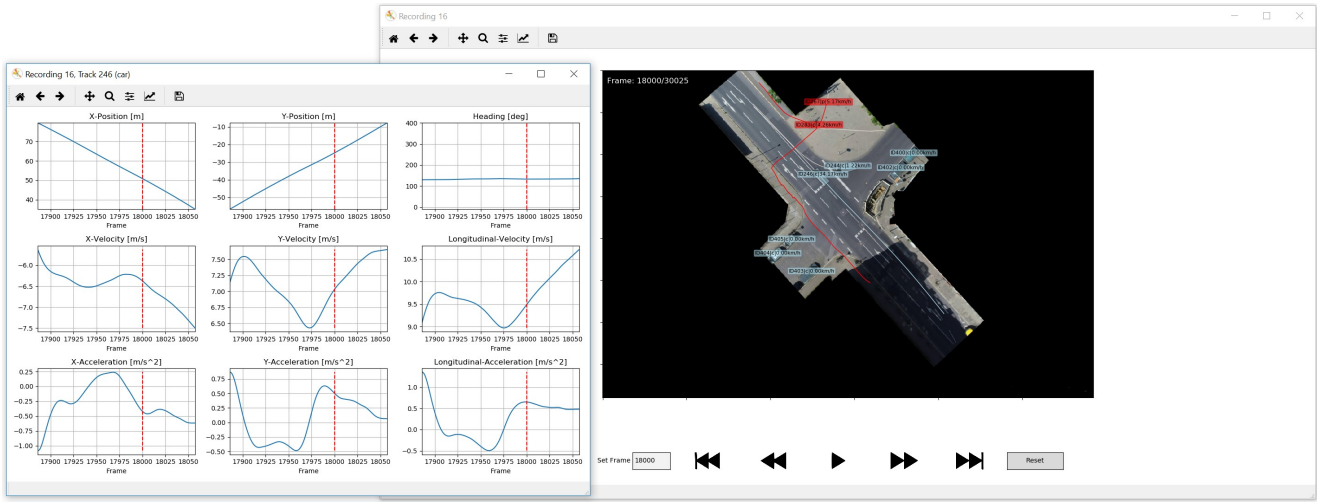
Visualizer

The visualizer imports the data and visualizes them on an image of the recording site. The user may visualize specific frames or just playback the recorded tracks. In addition, information like the track id or speeds may be displayed (see "Command-line Options"). By clicking on track, a separate window is created with plots of the clicked track's positions, headings, velocities and accelerations.

Each road user class has its own color: cars are light blue, vans are purple, buses are orange, trucks are orange, pedestrians are red, bicycles are yellow and motorcycles are yellow.

The following shortcuts are currently implemented:

Keyboard Shortcut	Description
space	Play/Stop the playback
right arrow	Jump to previous frame
left arrow	Jump to next frame



Command-line Options

The command-line options can be used when starting the `run_track_visualization.py` script. For example, run the following command from the `src` directory to start the visualization of recording 26.

```
python3 run_track_visualization.py --dataset germany_ramps --recording 26
```

All available options are listed in the following table:

Command-line Options	Default value	Description
`--help`	-	Show this help message.
`--dataset_dir`	`"../data/"`	Path to directory that contains the dataset csv files.
`--dataset`	`germany_ramps`	Name of the dataset. Needed to apply dataset specific visualization adjustments.
`--recording`	`26`	Name of the recording given by a number with a leading zero.
`--playback_speed`	`4`	During playback, only consider every nth frame.
`--show_bounding_box`	`False`	Plot the rotated bounding boxes of all vehicles. Please note, that for vulnerable road users, no bounding box is given.
`--show_orientation`	`False`	Indicate the orientation of all vehicles by triangles.
`--show_trajectory`	`False`	Show the trajectory up to the current frame for every track.
`--show_future_trajectory`	`False`	Show the remaining trajectory for every track.
`--annotate_track_id`	`False`	Annotate every track by its id.

Command-line Options	Default value	Description
`--annotate_class`	`False`	Annotate every track by its class label.
`--annotate_speed`	`False`	Annotate every track by its current speed.
`--annotate_orientation`	`False`	Annotate every track by its current orientation.
`--annotate_age`	`False`	Annotate every track by its current age.
`--show_maximized`	`False`	Show the track Visualizer maximized. Might affect performance.

Please note that drawing additional features may decrease the playback animation update rate.

Citation

If you use one of our datasets or these scripts in your work, please cite our datasets as follows:

inD Paper

```
@INPROCEEDINGS{inDdataset,
               title={The inD Dataset: A Drone Dataset of Naturalistic Road User Tra
               author={Bock, Julian and Krajewski, Robert and Moers, Tobias and Run
               booktitle={2020 IEEE Intelligent Vehicles Symposium (IV)},
               pages={1929-1934},
               year={2019},
               doi={10.1109/IV47402.2020.9304839}}
```

rounD Paper

```
@INPROCEEDINGS{rounDdataset,
               title={The rounD Dataset: A Drone Dataset of Road User Trajectories a
               author={Krajewski, Robert and Moers, Tobias and Bock, Julian and Vat
               booktitle={2020 IEEE 23rd International Conference on Intelligent Tra
               year={2020},
               doi={10.1109/ITSC45102.2020.9294728}}
```