Supervised Dataset

GTAV employs an in-game AI for driving which has been used here to generate a supervised dataset. 600k images were collected comprising 42 hours of real driving time. Half of that involves putting the car into bad states we want to learn our way out of (i.e. veering outside the center of the lane). This leaves ~21 hours of driving data in HDF5 format with 1000 images and data points per file.

Metadata (non-pixel data) in the "targets" hdf5 dataset:

1. Spin (yaw velocity)
2. Direction (1 for left spin, -1 for right spin)
3. Speed (velocity in the forward direction of the car, negative velocity represents going in reverse)
4. Speed change (change in the above value)
5. Steering (steering angle from 1 to -1, right to left, zero is straight ahead)
6. Throttle (gas pedal position from 0 to 1)

Some outputs are redundant (direction and speed change are merely derived from spin and speed respectively). This was done to see which outputs would be most useful in controlling the car. It also turned out to help with steering as consensus of two outputs helped to stabilize control of the car. i.e. The car is only turned when the direction output and steering output agreed in sign.

Throttle is controlled by matching the net's throttle output during acceleration and braking when speed of the car is below the net's desired speed.

Images were transformed from RGB to BGR for Caffe and can be read with this code.

While my model was trained on all the data, these file numbers are free of running off cliffs, outlier throttle values, and other undesirables.
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