Deep Learning and Autonomous Driving

Published: 09 Oct 2015 Category: deep_learning

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Courses

(Toronto) CSC2541: Visual Perception for Autonomous Driving, Winter 2016

- homepage: http://www.cs.toronto.edu/~urtasun/courses/CSC2541/CSC2541_Winter16.html

(MIT) 6.S094: Deep Learning for Self-Driving Cars

- homepage: http://selfdrivingcars.mit.edu/
- github: https://github.com/lexfridman/deepcars
- youtube: https://www.youtube.com/playlist?list=PLrAXtmErZgOeiKm4sgNOknGvNjby9efdf
- mirror: https://pan.baidu.com/s/1boLRFaB

How to Land An Autonomous Vehicle Job: Coursework

- blog: https://medium.com/self-driving-cars/how-to-land-an-autonomous-vehicle-job-coursework-e7acc2bfe740#.7vfjx3i1j

Papers

An Empirical Evaluation of Deep Learning on Highway Driving

- arxiv: http://arxiv.org/abs/1504.01716
- github: https://github.com/brodyh/caffe

DeepDriving

DeepDriving: Learning Affordance for Direct Perception in Autonomous Driving

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LINKS

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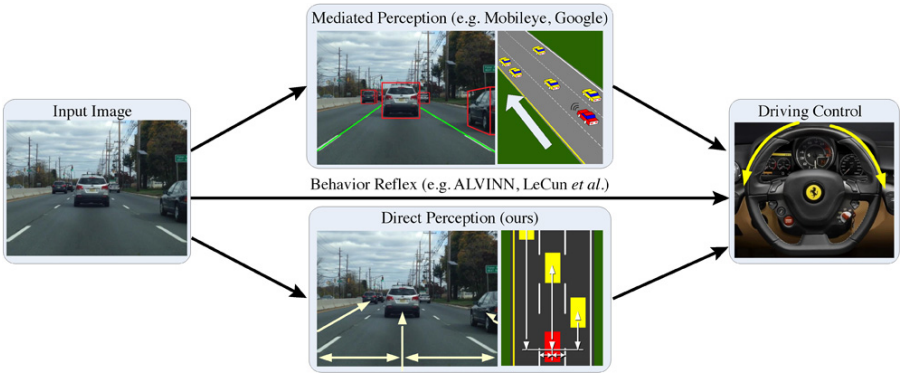
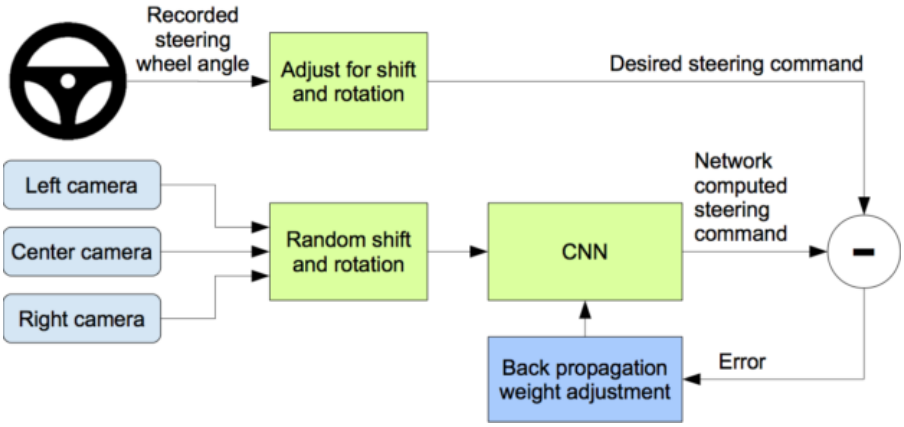


- project page: http://deepdriving.cs.princeton.edu/
- paper: http://deepdriving.cs.princeton.edu/paper.pdf
- code: http://deepdriving.cs.princeton.edu/DeepDriving.zip

End to End Learning for Self-Driving Cars

- intro: NVIDIA DevBox and Torch 7, 30 FPS
- arxiv: http://arxiv.org/abs/1604.07316
- blog: https://devblogs.nvidia.com/parallelforall/deep-learning-self-driving-cars/
- demo: https://www.youtube.com/watch?v=NJU9ULQUwng&feature=youtu.be
- github: https://github.com/SullyChen/Nvidia-Autopilot-TensorFlow

End-to-End Deep Learning for Self-Driving Cars



- blog: https://devblogs.nvidia.com/parallelforall/deep-learning-self-driving-cars/

Can we unify monocular detectors for autonomous driving by using the pixel-wise semantic segmentation of CNNs?

- arxiv: http://arxiv.org/abs/1607.00971

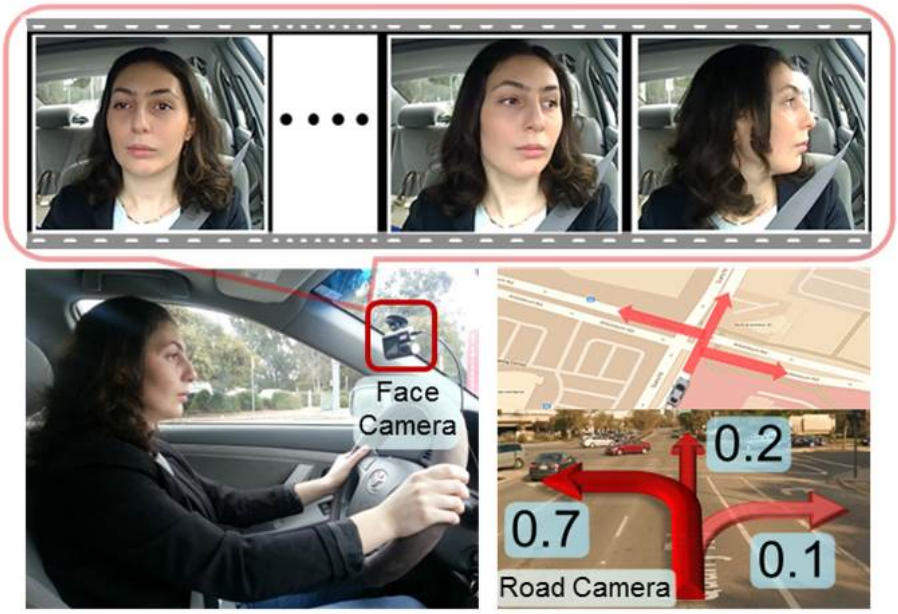
BRAIN4CARS: Cabin Sensing for Safe and Personalized Driving

Brain4Cars: Sensory-Fusion Recurrent Neural Models for Driver Activity Anticipation

Brain4Cars: Car That Knows Before You Do via Sensory-Fusion Deep Learning Architecture

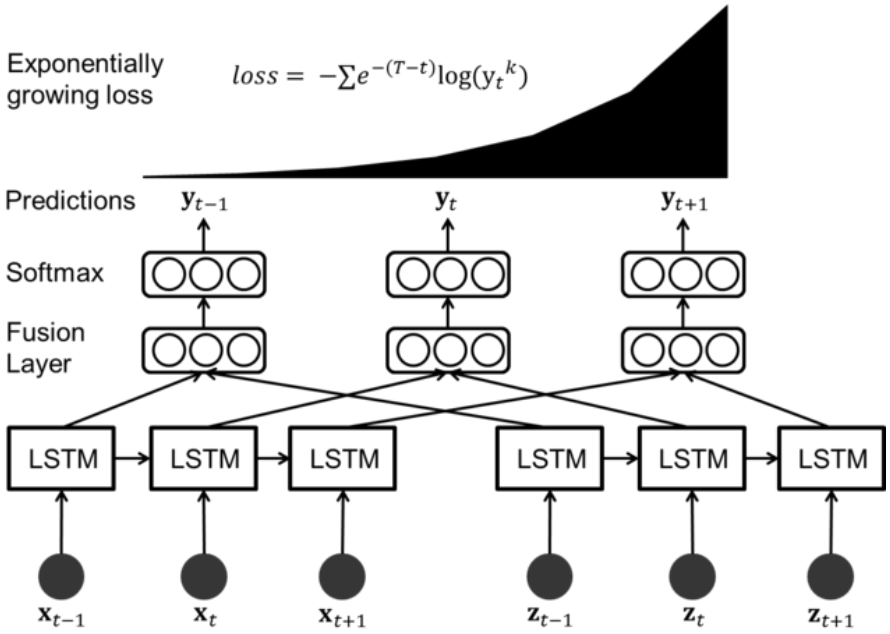
- arxiv: http://arxiv.org/abs/1601.00740

Car that Knows Before You Do: Anticipating Maneuvers via Learning Temporal Driving Models



- arxiv: http://arxiv.org/abs/1504.02789
- github: https://github.com/asheshjain399/ICCV2015_Brain4Cars

Recurrent Neural Networks for Driver Activity Anticipation via Sensory-Fusion Architecture

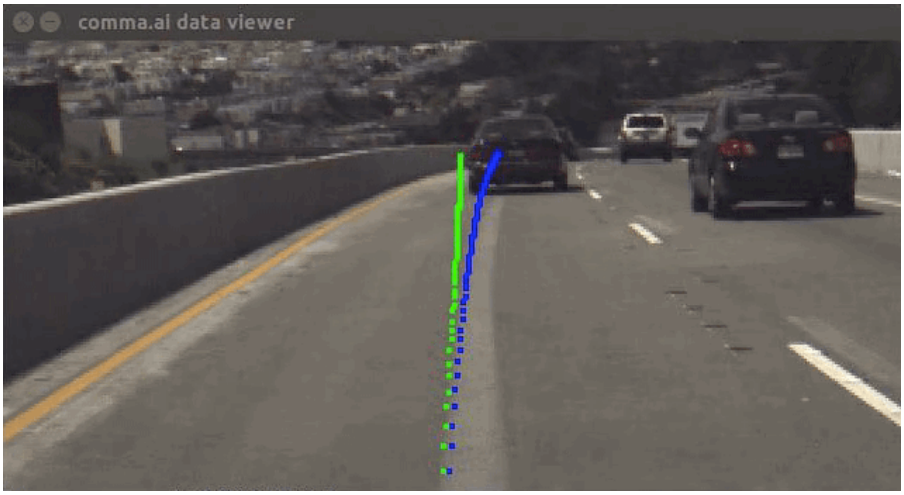


- project page: http://www.brain4cars.com/
- arxiv: http://arxiv.org/abs/1509.05016
- github: https://github.com/asheshjain399/RNNexp

Long-term Planning by Short-term Prediction

- arxiv: http://arxiv.org/abs/1602.01580

Learning a Driving Simulator



- introo: by hacker Geohot
- project page: http://research.comma.ai/
- arxiv: http://arxiv.org/abs/1608.01230
- paper: https://github.com/commaai/research/blob/master/paper/commalds.pdf
- github: https://github.com/commaai/research

Comma.ai open-sources the data it used for its first successful driverless trips

- blog: https://techcrunch.com/2016/08/03/comma-ai-open-sources-the-data-it-used-for-its-first-successful-driverless-trips/

Autonomous driving challenge: To Infer the property of a dynamic object based on its motion pattern using recurrent neural network

- arxiv: http://arxiv.org/abs/1609.00361

Safe, Multi-Agent, Reinforcement Learning for Autonomous Driving

- arxiv: https://arxiv.org/abs/1610.03295

Learning from Maps: Visual Common Sense for Autonomous Driving

- arxiv: https://arxiv.org/abs/1611.08583

SAD-GAN: Synthetic Autonomous Driving using Generative Adversarial Networks

- intro: Accepted at the Deep Learning for Action and Interaction Workshop, 30th Conference on Neural Information Processing Systems (NIPS 2016)
- arxiv: https://arxiv.org/abs/1611.08788

MultiNet: Real-time Joint Semantic Reasoning for Autonomous Driving

- intro: first place on Kitti Road Segmentation. joint classification, detection and semantic segmentation via a unified architecture, less than 100 ms to perform all tasks
- arxiv: https://arxiv.org/abs/1612.07695
- github: https://github.com/MarvinTeichmann/MultiNet

Interpretable Learning for Self-Driving Cars by Visualizing Causal Attention

- intro: UC Berkeley
- arxiv: https://arxiv.org/abs/1703.10631

Projects

↑

Caffe-Autopilot: Car autopilot software that uses C++, BVLC Caffe, OpenCV, and SFML

- github: https://github.com/SullyChen/Caffe-Autopilot

Self Driving Car Demo

- intro; A project that trains a virtual car to how to move an object around a screen (drive itself) without running into obstacles using a type of reinforcement learning called Q-Learning
- github: https://github.com/llSourcell/Self-Driving-Car-Demo/

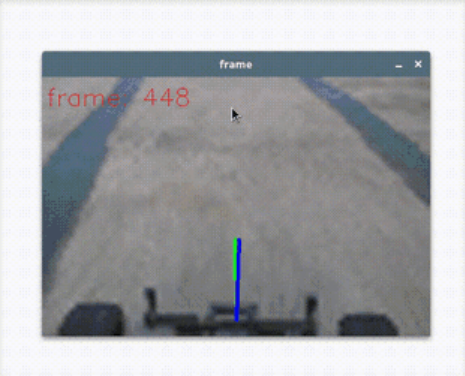
Autoware: Open-source software for urban autonomous driving

- github: https://github.com/CPFL/Autoware

Open Sourcing 223GB of Driving Data

- homepage: https://udacity.com/self-driving-car
- blog: https://medium.com/udacity/open-sourcing-223gb-of-mountain-view-driving-data-f6b5593fbfa5#.q8nk5bfpp
- github: https://github.com/udacity/self-driving-car

Machine Learning for RC Cars



- github: https://github.com/kendricktan/suiron

Self Driving (Toy) Ferrari

- github: https://github.com/RyanZotti/Self-Driving-Car

Lane Finding Project for Self-Driving Car ND

- github: https://github.com/udacity/CarND-LaneLines-P1

Instructions on how to get your development environment ready for Udacity Self Driving Car (SDC) Challenges

- github: https://github.com/gtarobotics/self-driving-car

DeepDrive: self-driving car AI

- intro: Caffe Model / Dataset / Tips and Tricks
- homepage: http://deepdrive.io/

DeepDrive setup: Run a self-driving car simulator from the comfort of your own PC

- github: https://github.com/crizCraig/deepdrive

DeepTesla: End-to-End Learning from Human and Autopilot Driving

http://selfdrivingcars.mit.edu/deeptesla/

Blogs

↑

Self-driving cars: How far away are we REALLY from autonomous cars?(7 Aug 2015)

http://www.alphr.com/cars/1001329/self-driving-cars-how-far-away-are-we-really-from-autonomous-cars

Practice makes perfect: Driverless cars will learn from their mistakes(9 Oct 2015)

http://www.alphr.com/cars/1001713/practice-makes-perfect-driverless-cars-will-learn-from-their-mistakes

Eyes on the Road: How Autonomous Cars Understand What They're Seeing

- blog: http://blogs.nvidia.com/blog/2016/01/05/eyes-on-the-road-how-autonomous-cars-understand-what-theyre-seeing/

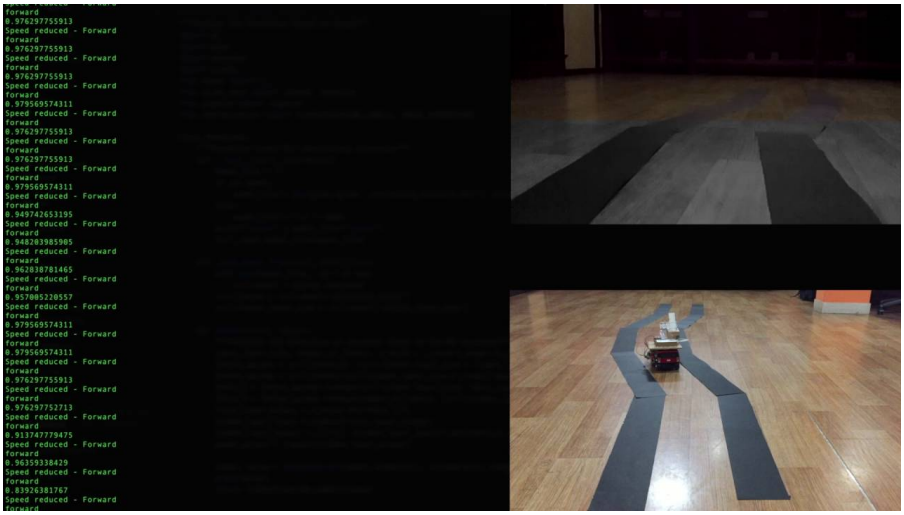
Human-in-the-loop deep learning will help drive autonomous cars

http://venturebeat.com/2016/06/25/human-in-the-loop-deep-learning-will-help-drive-autonomous-cars/

Using reinforcement learning in Python to teach a virtual car to avoid obstacles

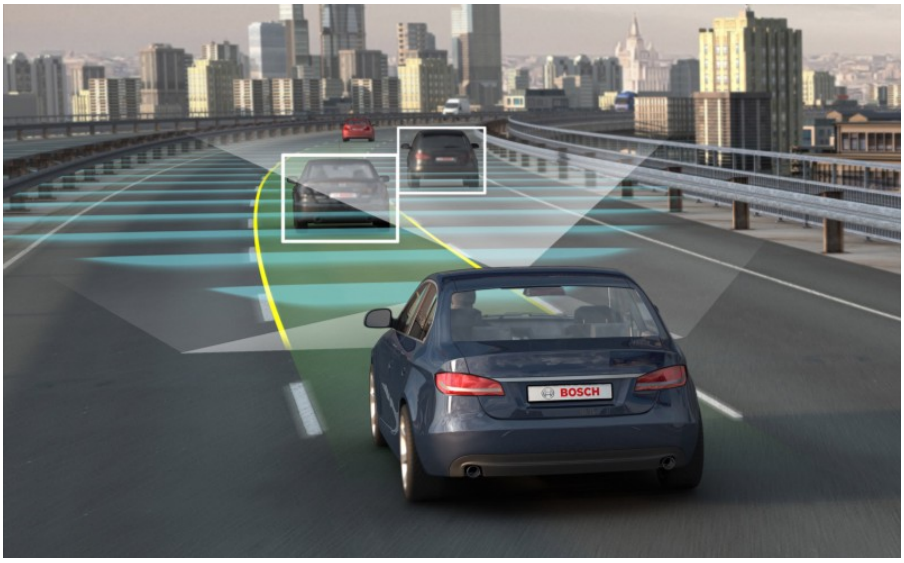
- part 1: https://medium.com/@harvitronix/using-reinforcement-learning-in-python-to-teach-a-virtual-car-to-avoid-obstacles-6e782cc7d4c6#.rneyuerga
- part 2: https://medium.com/@harvitronix/reinforcement-learning-in-python-to-teach-a-virtual-car-to-avoid-obstacles-part-2-93e614fcd238#.1pt1lli4c
- part 3: https://medium.com/@harvitronix/reinforcement-learning-in-python-to-teach-an-rc-car-to-avoid-obstacles-part-3-a1d063ac962f#.jwzm2v1r4
- github: https://github.com/harvitronix/reinforcement-learning-car

Autonomous RC car using Raspberry Pi and Neural Networks



- blog: http://www.multunus.com/blog/2016/07/autonomous-rc-car-using-raspberry-pi-and-neural-networks/
- github: https://github.com/multunus/autonomous-rc-car

The Road Ahead: Autonomous Vehicles Startup Ecosystem



https://medium.com/the-mission/the-road-ahead-autonomous-vehicles-startup-ecosystem-3c91d546673d#.gft1xyh9l

Deep Driving - A revolutionary AI technique is about to transform the self-driving car

https://www.technologyreview.com/s/602600/deep-driving/

**Visualizations for regressing wheel steering angles in self driving cars with Keras **

- blog: http://jacobcv.blogspot.jp/2016/10/visualizations-for-regressing-wheel.html
- github: https://github.com/jacobgil/keras-steering-angle-visualizations

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Deep Learning Applications »