Racing Robocars

...

Chris Anderson, DIYRobocars

cdixon blog

The next big thing will start out looking like a toy

DIYROBOCARS

FAST | CHEAP | OUT OF CONTROL

DONKEY CAR

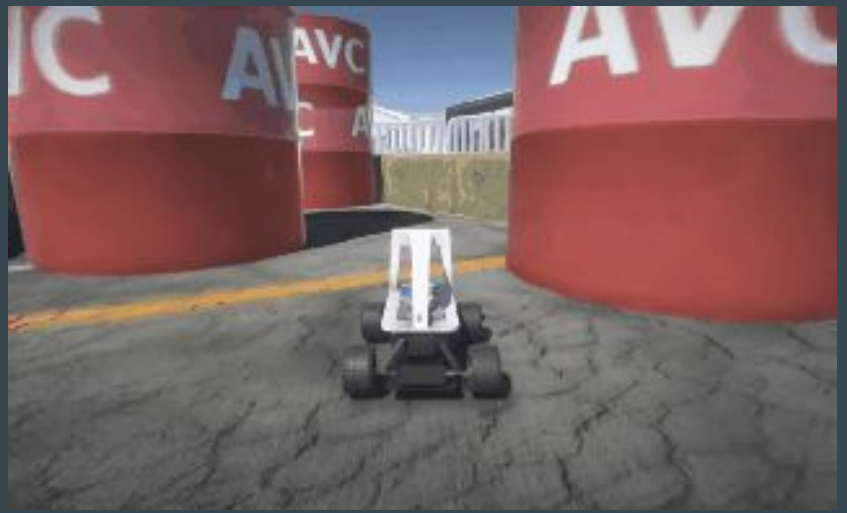

AWS ROBOCAR RALLY


13:12:53.71
9.3 mph

	DIY Robocar	Google/Waymo
Camera	1-2	5
Compute	RaspberryPi 3	Multiple Nvidia TX2
Radar	1	5
Lidar	2D, 4,000 points/sec	3D, 3,000,000 points/sec
GPS	yes	yes
Wheel encoders	yes	yes
IMU	yes	yes
Software	OpenCV + Tensor Flow	OpenCV + Tensor Flow + ?
Simulator	Unity-based	Unity-based
Cost	$200 - $500	$250,000?

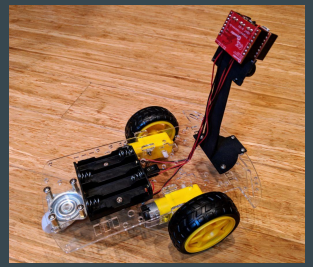

Stop


STOP
AVC

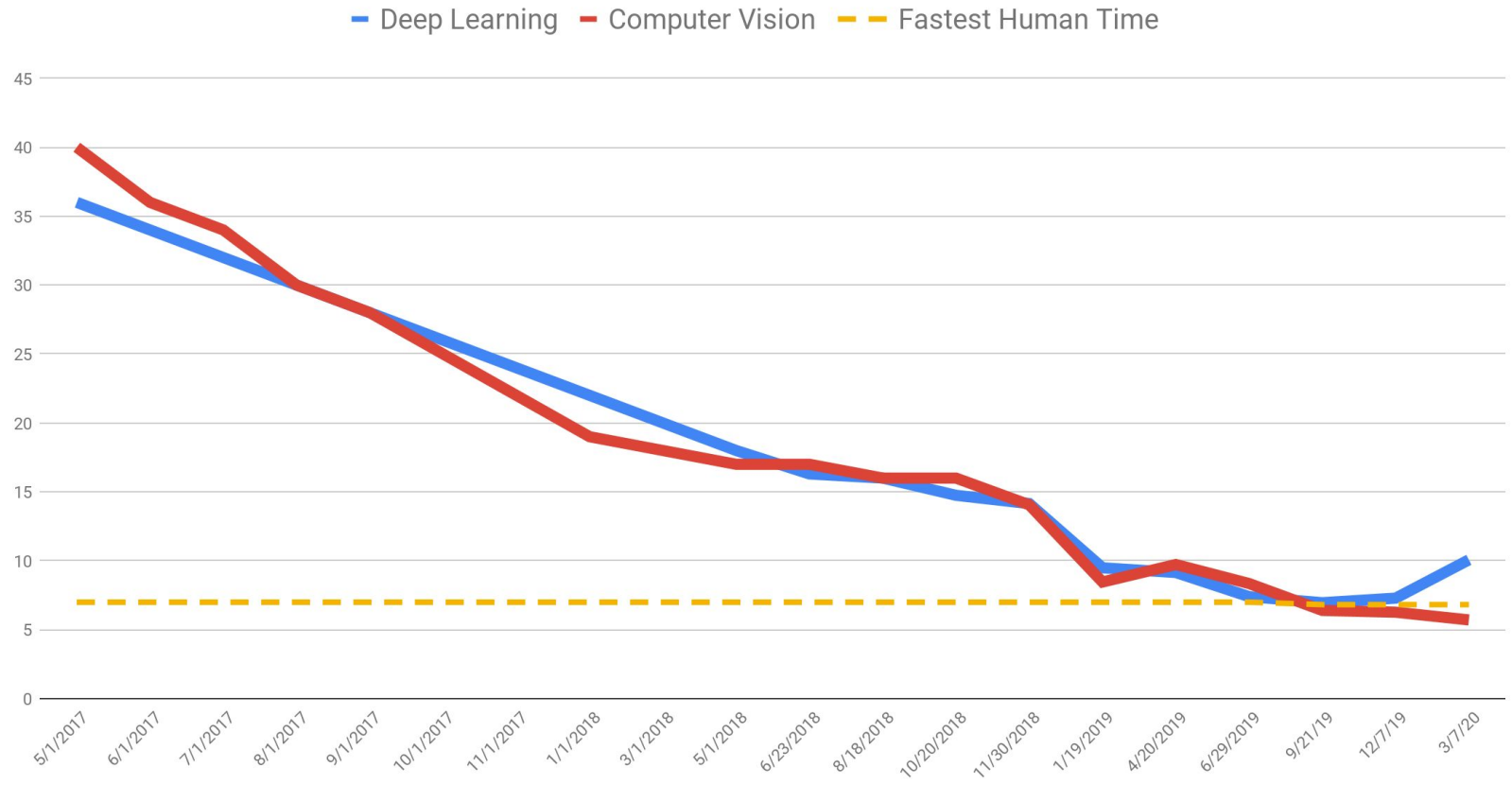

AVC

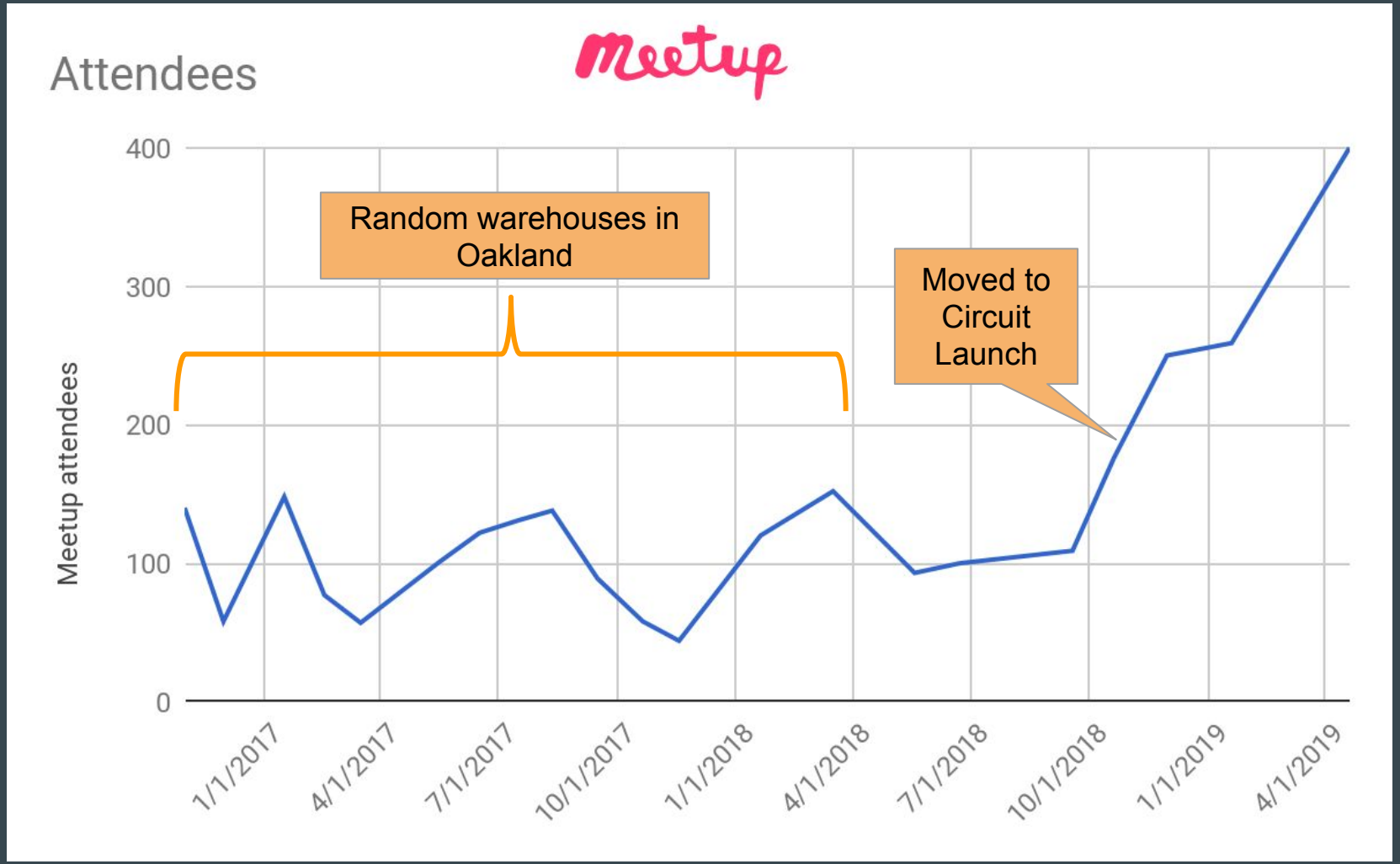
Types of DIY Robocars

	Computer Vision		Deep Learning	
Type	OpenMV	Custom	Behavioral Cloning	Reinforcement Learning
Standard platform	Minimum Viable Racer	ConeSlam	DonkeyCar	Amazon DeepRacer, Nivida Jetbot
Hardware	OpenMV	Nvidia Jetson Nano	RaspberryPi	Intel x86, Jetson Nano
Cost	$90	$200	$250	$300-400



DIY Robocars Race Results




Attendees
Meetup
Meetup attendees
400
300
200
100
0
Random warehouses in Oakland
Moved to Circuit Launch
1/1/2017
4/1/2017
7/1/2017
10/1/2017
1/1/2018
4/1/2018
7/1/2018
10/1/2018
1/1/2019
4/1/2019

Breakthrough Technologies

Hardware	Example	Enables...
Sub-$200 visual odometry, SLAM	Intel RealSense T265, T435	Localization, navigation
Sub- $100 Lidar	RPLidar A1	Obstacle avoidance
Sub-$100 CUDA core CPU	Jetson Nano	Better Deep Learning
Sub-$50 Linux SBCs	Raspberry Pi 3+	Linux for all!
Sub-$50 Integrated CV Camera	OpenMV, Jevois, Pixy 2	Super-simple Computer Vision
Software		
Deep Learning AI	TensorFlow/Keras	Machine learning
Photorealistic Simulation	Unity	Much faster development
Modern robotics frameworks	Nvidia Isaac	Much faster development, sensor fusion


naisy 0.81
00,30
FPS: 58,6
Log Count
ParkingLotNerds
DONKEY CAR
Race
Stop
Exit

FOR MORE INFORMATION

DIYRobocars.com

Donkeycar.com

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