

Simulation and Validation for ADAS & AV

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Cognata at a Glance

Founded

2016

Employees

50+
and hiring

Team



Raised

>\$23M

Investors



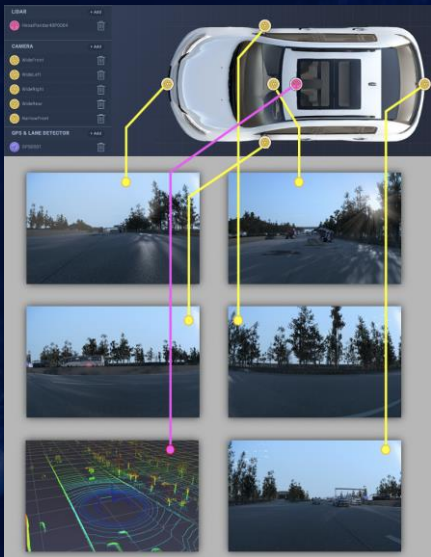
Partners



Simulation

Software-in-the-Loop Simulation for ADAS and AV - Cloud and OnPrem

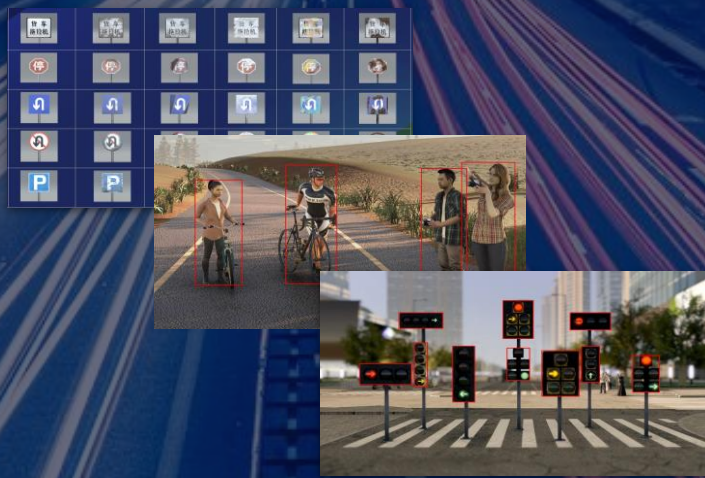
実環境を完全再現したデジタルツイン環境
豊富でカスタマイズ可能なセンサーモデル
EgoCar/MovingObjectの容易な設定による走行仮想世界の作成



Datasets

Automotive-grade training and validation data

リアルな教師データと完璧にアノテーションされた真値 (Ground Truth) のご提供

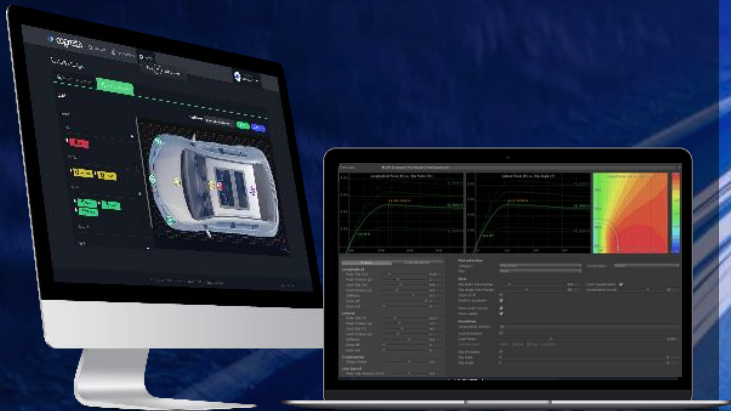


業界スタンダードとの連携

- ・ Matlab/Simulink®、ROS対応 SDKのご提供
- ・ OpenDrive/OpenScenario、SUMO インテグレーション
- ・ EURO NCAPシナリオ対応
- ・ 他ツールとの容易な連携やCI(Continuous Integration)対応

Local Station

Closed Loop Simulation
エンジニアデバッグ環境の
ご提供



Cloud & Services

Open Loop Simulation
Billions Milesの試験走行を
提供する仮想環境



HiL Bench

Target Hardware in the loop
tests



4つのテクノロジーレイヤー

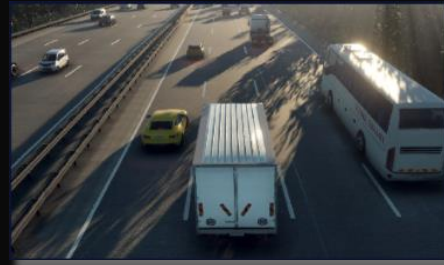
Static

3D World



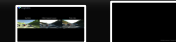
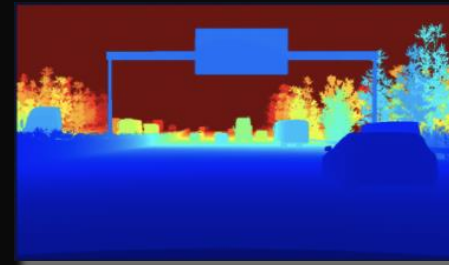
Dynamic

AI Traffic Models



Sensing

Emulation



Cloud

And analytics



カメラのカスタマイズ(Distortion and Resolution)や 高精度カメラ効果再現をサポート



Ideal

30 Degrees



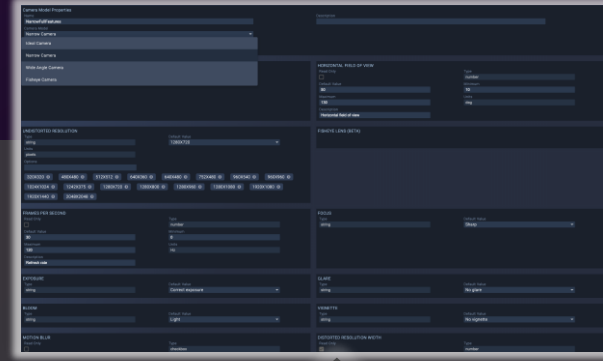
Narrow angle

50 Degrees



Wide angle

110 Degrees



Web UI Configuration

Defining a dedicated camera model and uploading it to the system from client end



Python Script



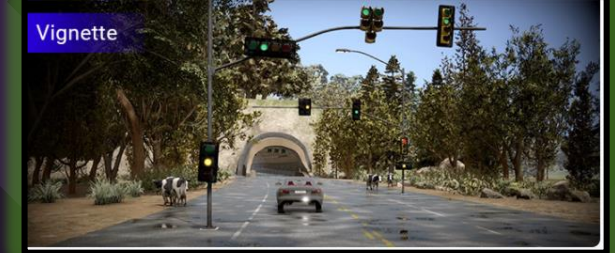
Fisheye Camera



Overexposure and Bloom



Glare



Vignette

カスタマイズ可能なLiDARモデル

```
import numpy as np
import pandas as pd
import json

LIDAR = [-2.86, -2.00, -1.20, -0.40, 0.40, 1.20, 2.00, 2.80]

VLP16 = [-15.0, -13.0, -11.0, -9.0, -7.0, -5.0, -3.0, -1.0,
         1.0, 3.0, 5.0, 7.0, 9.0, 11.0, 13.0, 15.0]

VLP16lines = [-10.00, -8.67, -7.33, -6.00, -4.67, -3.33, -2.00, -0.67,
             0.67, 2.00, 3.33, 4.67, 6.00, 7.33, 8.67, 10.00]

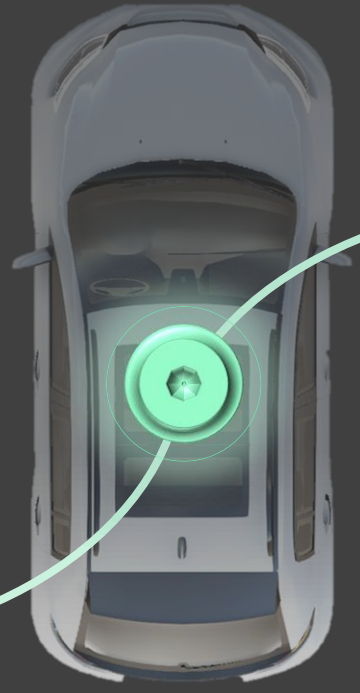
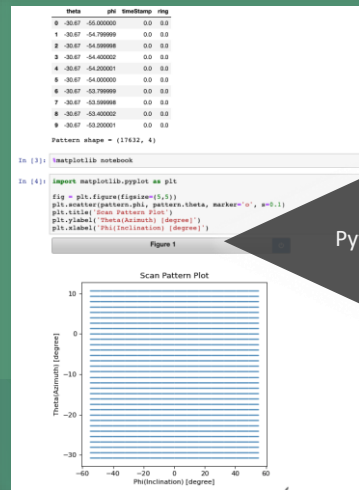
VLP32C = [-25.00, -15.64, -11.31, -8.84, -7.25, -6.15, -5.33, -4.67,
          -4.00, -3.67, -3.33, -3.00, -2.67, -2.33, -2.00, -1.67,
          -1.33, -1.00, -0.67, -0.33, 0.00, 0.33, 0.67, 1.00,
          1.33, 1.67, 2.00, 2.33, 2.67, 3.00, 3.33, 3.67, 4.00, 4.33, 4.67,
          5.00, 5.33, 5.67, 6.00, 6.33, 6.67, 7.00, 7.33, 7.67, 8.00, 8.33, 8.67,
          9.00, 9.33, 9.67, 10.00, 10.33, 10.67]

RMC32E = [-30.67, -29.33, -28.00, -26.67, -25.33, -24.00, -22.67, -21.33,
          -20.00, -18.67, -17.33, -16.00, -14.67, -13.33, -12.00, -10.67,
          -9.33, -8.00, -6.67, -5.33, -4.00, -2.67, -1.33, 0.00,
          1.33, 2.67, 4.00, 5.33, 6.67, 8.00, 9.33, 10.67]

RMC64E = [-24.33, -23.83, -23.33, -22.83, -22.33, -21.83, -21.33, -20.83,
          -20.33, -19.83, -19.33, -18.83, -18.33, -17.83, -17.33, -16.83,
          -16.33, -15.83, -15.33, -14.83, -14.33, -13.83, -13.33, -12.83,
          -12.33, -11.83, -11.33, -10.83, -10.33, -9.83, -9.33, -8.83,
          -8.33, -8.00, -7.67, -7.33, -7.00, -6.67, -6.33, -6.00,
          -5.67, -5.33, -5.00, -4.67, -4.33, -4.00, -3.67, -3.33,
          -3.00, -2.67, -2.33, -2.00, -1.67, -1.33, -1.00, -0.67,
          -0.33, 0.00, 0.33, 0.67, 1.00, 1.33, 1.67, 2.00]

ElevationList = {'VelodyneLiDARbackVLP32C': VLP32C,
                 'VelodyneVLP32C': VLP32C,
                 'VelodyneVLP16': VLP16,
                 'VelodyneVLP16': VLP16,
                 'VelodyneVLP16lines': VLP16lines,
                 'VelodyneRMC32E': RMC32E,
                 'VelodyneRMC64E': RMC64E,
                 'IsacLIDAR': LIDAR}

class ScanPattern:
    """
    ScanPattern Class
    Container for list of tuples representing a scan pattern, saved as a dataframe
    """
    def __init__(self, points):
        self.pattern = pd.DataFrame(points)
```



Web UI Configuration

CREATE NEW SCANNING PATTERN

Scanning Pattern name*

Description*

Upload Scanning Pattern file content

- Range: Maximum Range, Range Accuracy
- Capture Rate, Rotation Rate, Mask Resolution
- Noise: Max PHI Noise, Max THETA Noise
- Radius
- Super Sampling Rays
- Threshold

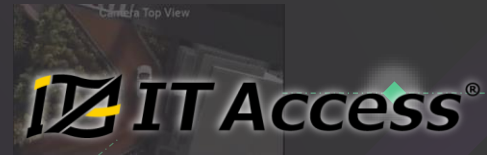
Simulation Automation

Name	Created	Status	Resolution	Active
New scenario Highway	11/15/20 3:55 PM	ON		ON
New scenario Highway	11/15/20 3:55 PM	ON		ON
New scenario Highway	11/15/20 3:55 PM	ON		ON
New scenario Highway	11/15/20 3:55 PM	ON		ON
45km Highway - Map Planning Vehicles_24_vehicles_16_page_10_vehicle_00_vehicle	11/15/20 3:44 PM	ON		ON
Highway Jam - Planning Vehicles_24_vehicles_16_page_10_vehicle_00_vehicle	11/15/20 3:44 PM	ON		ON
Pittsburgh - Planning Vehicles_24_vehicles_16_page_10_vehicle_00_vehicle	11/15/20 3:44 PM	ON		ON
March - Planning Vehicles_24_vehicles_16_page_10_vehicle_00_vehicle	11/15/20 3:44 PM	ON		ON
Test Track - Planning Vehicles_24_vehicles_16_page_10_vehicle_00_vehicle	11/15/20 3:44 PM	ON		ON
New scenario Urban Hwy (Daytime)	11/15/20 3:15 PM	ON		ON
New scenario Urban Highway	11/15/20 3:10 PM	ON		ON
New scenario Urban Highway	11/15/20 3:05 PM	ON		ON
110114	11/15/20 3:08 PM	ON		ON
New scenario Synthetic	11/15/20 11:40 AM	ON		ON
New scenario Synthetic	11/15/20 11:38 AM	ON		ON
Collision - Center 1 image	11/15/20 11:38 AM	ON		ON
Collision - Center 1 image	11/15/20 11:38 AM	ON		ON
March Traffic Camera	11/15/20 3:18 PM	ON		ON
March	11/15/20 3:02 PM	ON		ON
March	11/15/20 3:02 PM	ON		ON

Scripting Control over Python

```
#####
# Scene variables
#####
maps_arr = ['Highway', '45km Highway', 'Munich', 'Shanghai', 'Test Track', 'Shanghai', 'Pittsburgh']
# maps_arr = ['Highway']
weather_conditions_arr = ['clear', 'cloudy', 'rain', 'heavy_rain', 'fog', 'overcast']
time_of_day_arr = ['morning', 'noon', 'afternoon', 'evening', 'sunrise', 'sunset', 'before_dawn']
preset_name = "Single_Cam"
sim_timeout = 10
n_runs = 5
seed = "1234"
variables = None

#####
# Scene settings
#####
random_seed = True
run_simulation = True
annotate = True
add_vehicles = True
add_pedestrians = True
add_parking_vehicles = True
add_jaywalkers = True
add_static_objects_on_road_edges = True
add_static_objects_on_road = True
scenario_tags = ['Random_Scenario']
simulation_tags = ['Test_Plan_17062020_0906AM']
client_version = ""
```



Aggressive Lane change

Close Cut-in

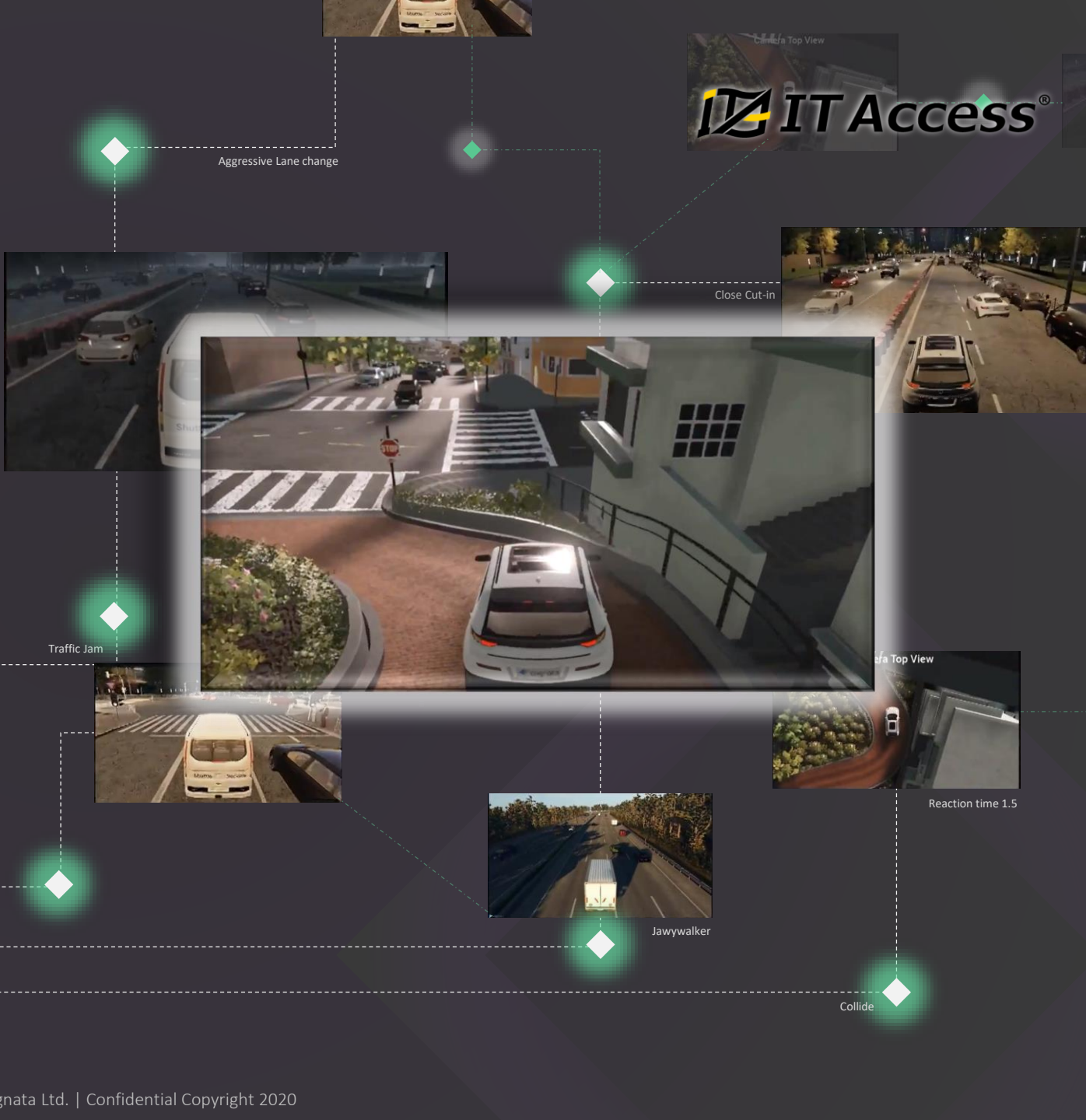
Traffic Jam

Camera Top View

Reaction time 1.5

Jaywalker

Collide



実環境を再現したデジタルツイン環境のご提供と 3Dシミュレーション環境の追加が可能

IT Access®



Shanghai



San Francisco



Parking Lot



Munich

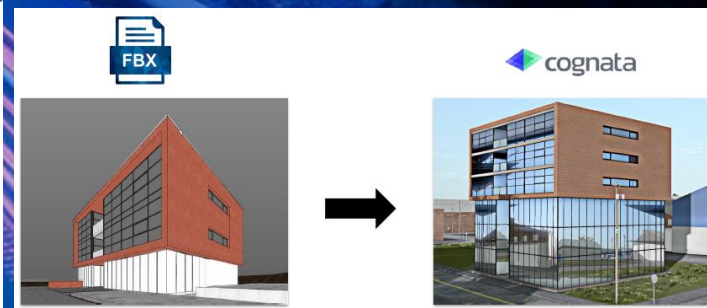


Highway



Paris

※Japan city is coming soon!



完全な真値 (Ground Truth) で提供

バウンディングボックス



インスタンスセグメンテーション



マテリアルセグメンテーション



あらゆる地形条件、気象条件、時刻を再現



地形条件・気象条件・時刻

No Wear <input checked="" type="checkbox"/>	clear <input checked="" type="checkbox"/>	morning <input checked="" type="checkbox"/>
Slight Wear	cloudy	noon
Moderate Wear	rain	afternoon
Heavy Wear	heavy rain	evening
Faded	fog	sunrise
Disappeared	overcast	sunset
		before dawn



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Thank you!