Evolutionary AI platform for 5G network performance optimization

Product presentation

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5G is rapidly gathering momentum across the globe with **80** operators in **50** countries, and **1 million** cell towers in US alone.

To provide users with stable connections and to support new services, it's crucial to increase 5G coverage by efficient site planning and agile deployment of any new equipment.

Also, it's very important to perform efficient maintenance checks of the existing base stations.

Problems in 5G site maintenance

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Mostly human-based activities leading to high costs – Sky Engine AI platform is solving all of these problems!

5G site planning and inventorying is very challenging due to a lack of 3D site maps to keep track of the installed equipment and planning relies on a poor data – pictures taken using a mobile phone by a site engineer

Maintenance of cell towers requires frequent costly and time-consuming on-site inspections: missing nuts, incorrect mounting angles, tilt, vertical deviations of the tower, structural damage, loose wiring, corrosion, stretched cables

Variety of **equipment in difficult-to-reach locations:** cell towers, telco sites on buildings, large venues with a lot of antennae such as stadiums – **risk from height and electrical hazard**

FIRST PUBLIC DEMO

GPU TECHNOLOGY CONFERENCE

Silicon Valley, March 2019

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The very first **evolutionary AI platform** designed for **5G network performance optimization**

Sky Engine AI platform for Telco site maintenance

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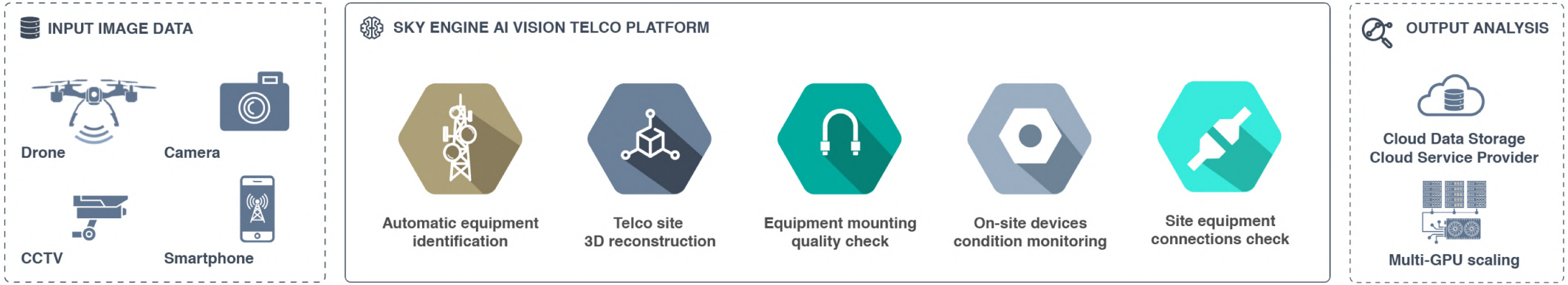
Sky Engine modules dedicated to optimizing cell tower & site operations



+ 5G network high up time enabler
+ Avoid any GDPR-related issues with Sky Engine AI platform
+ Sky Engine AI can pilot and navigate drones and robots to automatize full task chain
+ Improving site engineers safety and efficiency
+ Optimizing annual operational and safety inspections
+ Complying with bird protection legislation
+ Sky Engine AI enables real-time analytical reporting and a quick, safe response in an emergency

Module: Automatic identification

How to keep track of the installed on-site equipment?

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Telco equipment

AI-driven visual identification

Changing weather conditions
Sensors fusion support

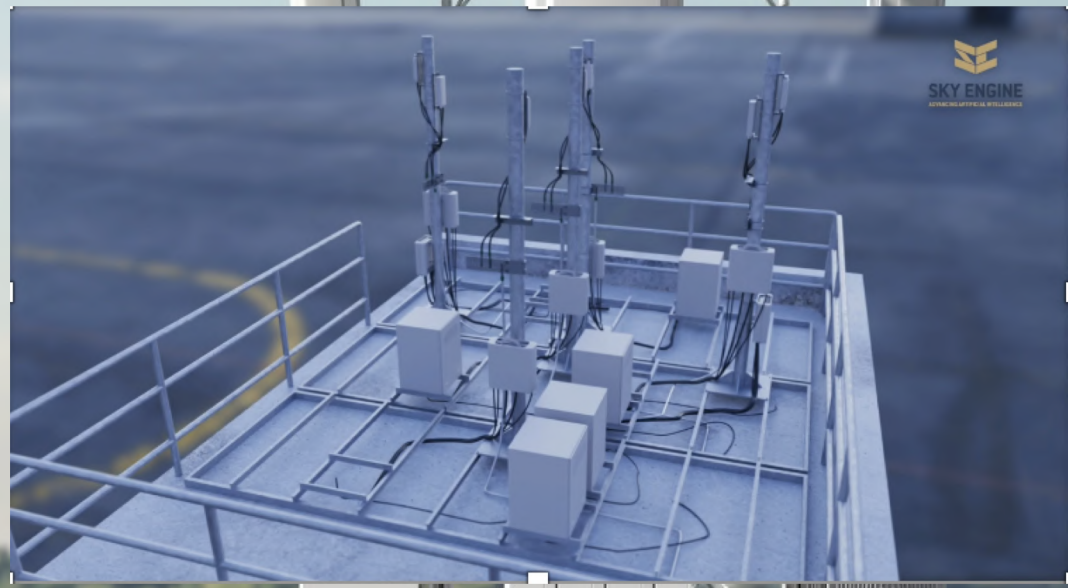
SKY ENGINE PLATFORM MODULE:

Sky Engine can use CAD models and equipment plans and adjust pretrained deep learning models to perform recognition tasks of equipment – antennas, radios, cables, but also screws, washers, cases etc. This modules can be used for analysis of images taken on site by technicians or recorded during drone based inspection.

Module: Automatic 3D reconstruction

How to enable time- and cost-efficient site planning?

Sky Engine AI 3D telco site reconstruction



5G infrastructure

AI-driven assets management

SKY ENGINE PLATFORM MODULE:

Deep learning algorithms for device recognition and 3D positioning. Based on incomplete datasets (images from drones or mobile, cheap cameras) Sky Engine recognizes devices and creates 3D visualisation of a site to enable efficient planning of site engineers work and site assets inventorying.

Module: Equipment mounting checking

How to quickly inspect mounting of on-site devices in multiple views?

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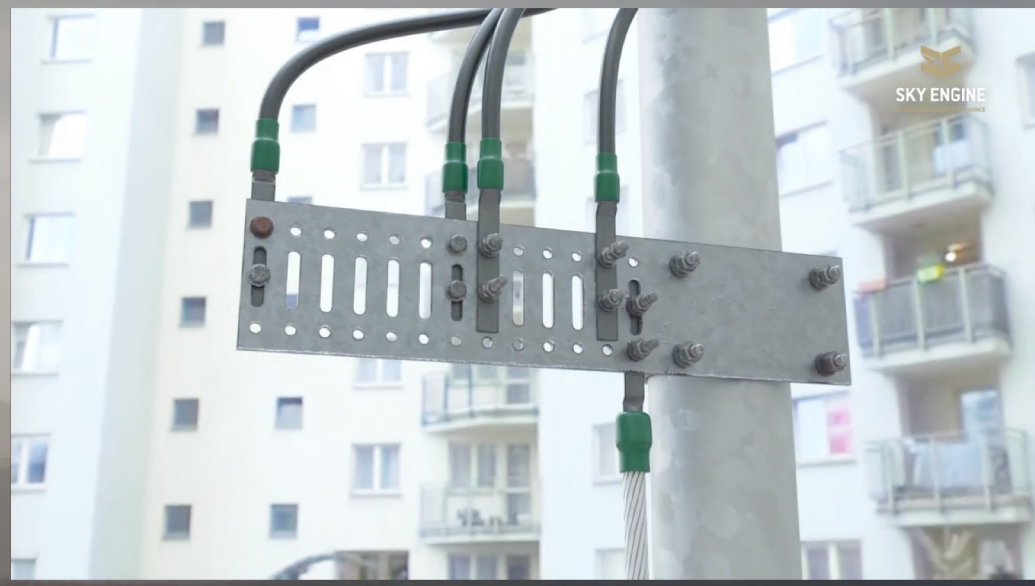
Telco equipment

AI-driven mounting quality check



SKY ENGINE PLATFORM MODULE:

Sky Engine module designed for detection and 3D localisation of any parts including nuts, washers, casing, cables, connectors, bolts, etc. Sky Engine validates the on-site equipment mounting according to the predefined rules and standards.

Module: Device condition monitoring

How to perform real-time visual wear and tear telco equipment monitoring?

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Telco equipment

AI-driven condition monitoring

SKY ENGINE PLATFORM MODULE:

Sky Engine AI platform analyses equipment surface condition of telecom devices and detects scratches, corrosion, structural damage, cable bends, etc.

Module: Device connections checking

How to quickly detect incorrectly connected telco equipment?

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Telco equipment

AI-driven connection check

SKY ENGINE PLATFORM MODULE:

Sky Engine detects connectors, traces cables and validates quality of all connections according to the predefined rules.

SKY ENGINE AI VISION TELCO platform

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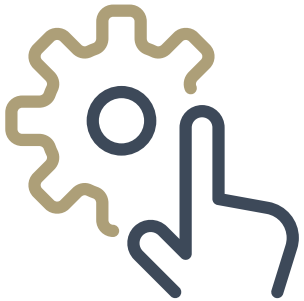
Value proposition

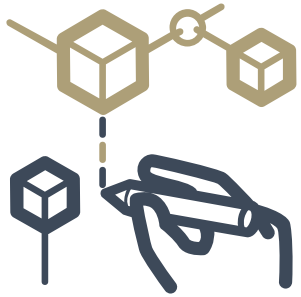


MAINTENANCE WORKS RELIABILITY BOOST

Sky Engine driven validation of human's work wrt applicable standards and guidance enables service cost decrease

HIGHEST UP TIME OF CELL TOWER

Sky Engine AI automatically performs accurate on-site hardware condition checks to decrease base station failure rate



SITE PLANNING EFFICIENT MANAGEMENT

Evolutionary Sky Engine AI enables rapid cell site works planning on a scale with improved accuracy

SAVE ON HUMAN RESOURCES

No GDPR issues and less human interaction is required through processing automatization – engineers do not required to perform analysis on site

NETWORK & COST OPTIMIZATION

Makes AI-driven Telco Business Transformation very efficient – Sky Engine fulfills 95% of data needs for site maintenance & planning

Evolutionary SKY ENGINE AI platform

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FIRST PUBLIC DEMO
GPU TECHNOLOGY CONFERENCE
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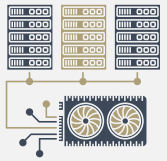
Underlying magic (and technology)

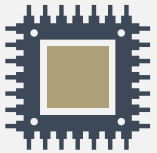


GPU ray-tracer
with sets of Physics-based rendering shaders

AI-based image and video processor for domain adaptation

Garden of deep neural network architectures for 3D/4D training

Multi-GPU and network level training tasks scheduler



GPU memory level **integration** with **PyTorch** and **TensorFlow**

Deep integration of well-known technologies for
Data Scientists and **Software Engineers**

Adobe SUBSTANCE PyTorch TensorFlow

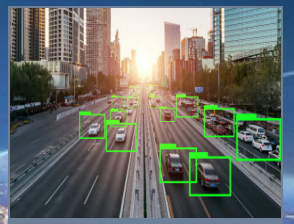
More Sky Engine applications

Smart cities by Sky Engine AI – scaling proposition

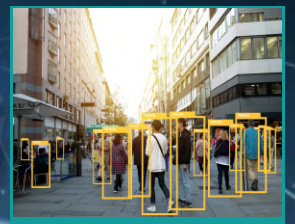
Sky Engine Smart City

Intelligent cities **of tomorrow**

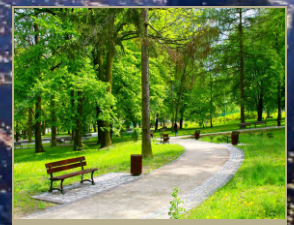
- Traffic analytics
- Crowd analytics
- Smart monitoring


VEHICLES 3D TRACKING

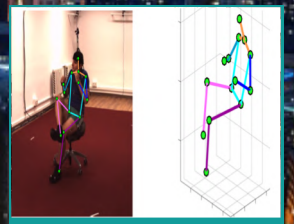

INTER AREA TRACKING


3D HUMAN DETECTION


THERMAL EXHAUST TESTING


GREEN AREA MONITORING


TELCO EQUIPMENT CHECK


3D POSE ESTIMATION


HEATMAPS & PREDICTION

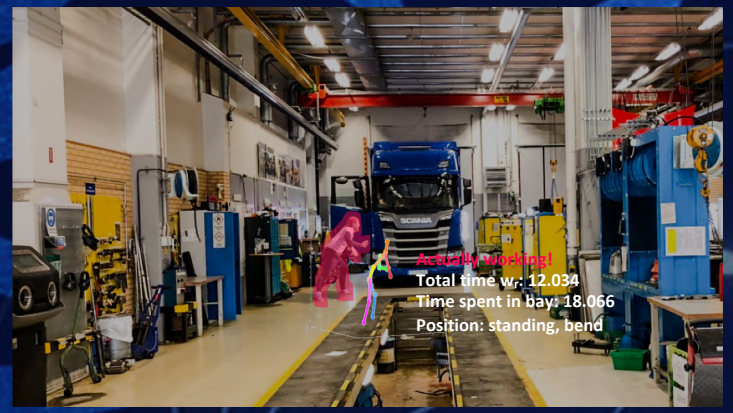

PUBLIC INFRASTRUCTURE

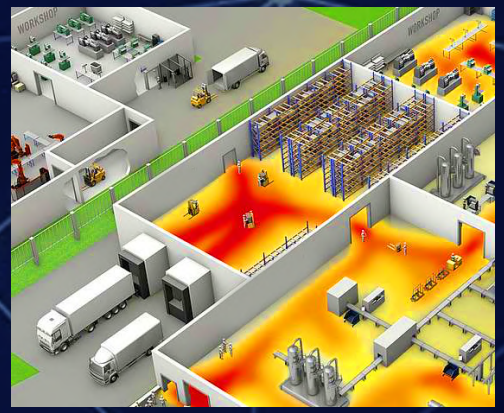
More Sky Engine applications

Selected use cases demonstration

AI analytics **in truck workshops**

- Service revenue optimization
- Vehicles working bay AI analytics
- Heatmaps and statistics
- Workers and tools tracking





Partners

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Sky Engine offices around the globe

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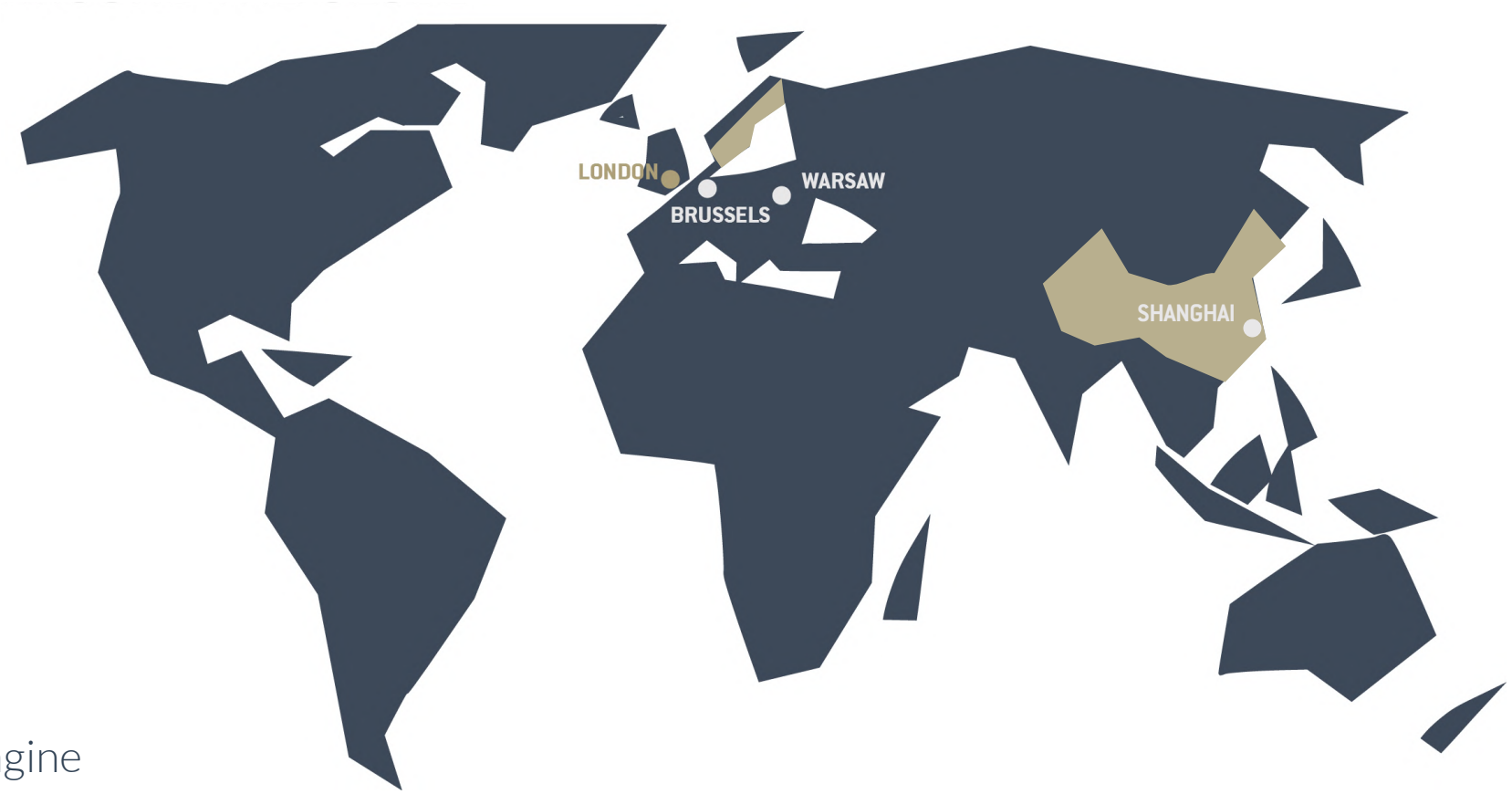
Meet us!



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Technical presentation video recording **"Raytracing for Deep Neural Networks Training"**, Nvidia GTC 2020 by Jakub Pietrzak, Chief Technology Officer can be found here:
https://developer.nvidia.com/gtc/2020/video/t22124

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GTC GPU TECHNOLOGY CONFERENCE

San Jose, Silicon Valley, US, 22-26 March 2020

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NVIDIA

SKY ENGINE to showcase the power of the first evolutionary AI platform at **NVIDIA GTC 2020**

Sky Engine is the very first self-learning AI toolset for computer vision applications

THANK YOU

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www.SkyEngine.AI