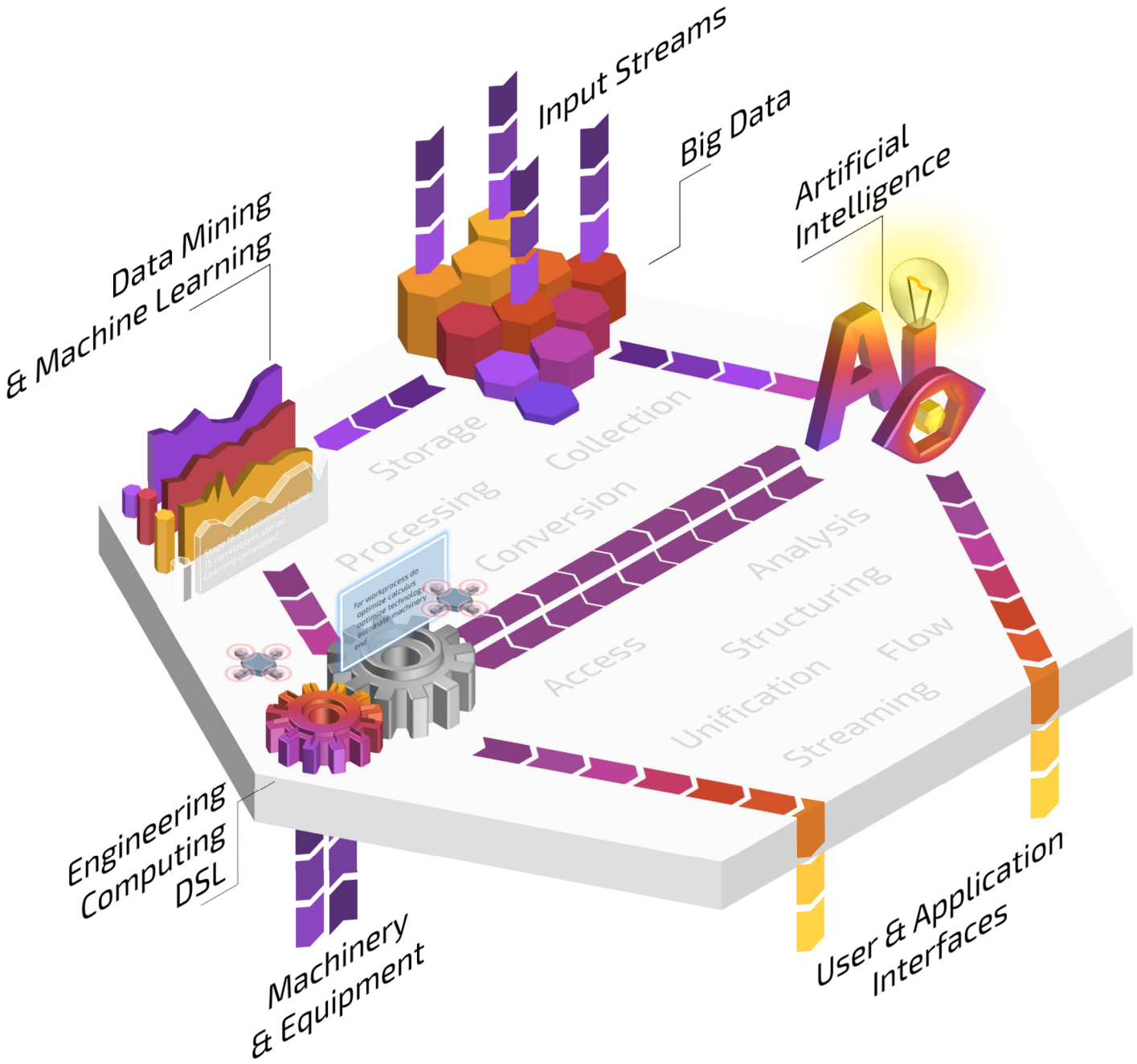
# Orlando AUTOMATE

by ORLANDO LABS

DATA SCIENCE PLATFORM FOR AUTOMATION AND OPTIMIZATION OF PRODUCTION AND ENGINEERING PROCESSES

# 1 About




Orlando AUTOMATE is an individually configured integrable software and hardware solution allowing to bring work, technology, and production processes in various fields of engineering to the brand new heights due to the highest automation level, deep seamless integration of system components along with the most modern programming and algorithmic artificial intelligence techniques, Big Data, and computer vision.

## 2 Tasks, Objectives, & Possibilities

Orlando AUTOMATE solves the most complex industry tasks of high automation and multiparametric optimization using convenient and effective interfaces to unstructured and unhandy data.

### Applicable fundamental tasks

- Resource-intensive engineering and statistical tasks
- Exclusion of human factor from processes.
- Hidden data patterns and connections search
- Multiparametric optimization of objects and processes
- Time series prediction and forecasting

### Achievable objectives

- Fundamentally higher level of product
- Reduction of flawed product output rate and product rejects caused by human factor
- Reduction of time expenses and financial costs of R&D
- Product quality stabilization
- Gaining significant competitive advantages
- Ultimate predictability of controlled processes
- Reduction of requirements for staff and simpler personnel training

### Product classes*

- DPI/DLP/WAF**
- DCS/DAQ/DAS/DAPS**
- DSS**
- SCADA**
- CAD/CAE**
- SACS/ACS**
- Decentralized systems, Blockchain, Consensus Building Systems**
- Any combination of classes**

* - including, but not limited to
** - including high-load versions

## 3 Application and Deployment

Orlando AUTOMATE applies to the broadest range of cases. The typical ones are:

- decision-making based on explicit, implicit, or hidden values and patterns gathered from intensive incoming data streams.
- intellectual evolutionary multiparametric optimization of objects and processes
- decentralization of data control
- integration of AI with machinery and equipment, including UAVs

In a typical case, the configuration of the platform and tasks spectrum are individually designed and tuned for each customer. The specific platform configuration is based on customer requirements as well as on the results and proposals of Orlando Labs LLC audit.

# 4₁ Case: Deep financial data analysis system

**Case**

Israel financial company providing stock and currency trading is required to organize internal data structures in order to match new strict government laws and rules regulating the growing field of stock and currency exchanges.

**Tasks & objectives**

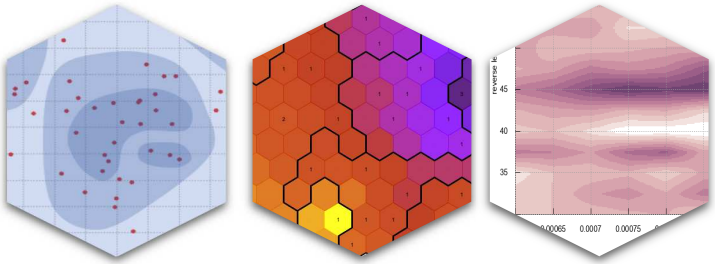
Trading data, being generated on the rates of 7 Gbps, is required to be structured and persisted in the given formats and then partially forwarded to government-provided storages. This data must be inspected and scanned in the real time for signs and shreds of evidence of market manipulations. No trading data is allowed to lost.

**Solution**

Developed a configuration for Orlando AUTOMATE that integrates DPI and DACS submodules. Endpoint product provides the required functionality of collecting incoming trading data, inspection for market manipulation patterns, and reporting found parts of evidence to the government servers.

**Result**

Full accordance of customer exchanges to the law requirements that allows the customer to operate on the national market legally while effective reporting of law violations by traders.



# $4_2$ Case: Enterprise infrastructure and networks diagnostics

**Case**

One of the industrial enterprises is suffering from periodical engineering networks failures and unwanted effects such as corona discharges on electrical power lines, thermal isolation damages on heating networks, and steam and liquids leakage. The current method of diagnostics use human resources and, thus, highly inefficient and unreliable.

**Tasks & objectives**

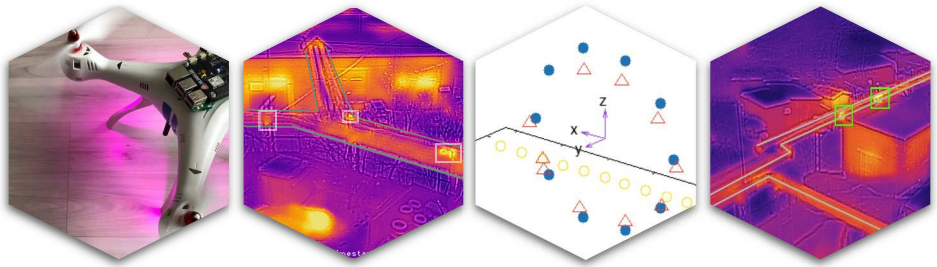
1) Design automatic diagnostics methods for every case of potential damage to enterprise infrastructure.
2) Develop an automated way to patrol the entire enterprise infrastructure using these methods.

**Solution**

Studied research papers and then did our research, we developed specific multi-copter UAVs equipped with an onboard computer, air pollution sensors, infrared, ultraviolet, and visible spectra cameras. The group of UAVs may act independently each on its ground-controlled mission as well as in a decentralized manner with each-to-each data exchange and consensus-based AI-decisions while respecting ground operator control.

**Result**

Exclusion of human work in difficult of approach or dangerous locations. Several orders of magnitude faster target route bypass. Much more precise visual and instrument measurements directly from the areas of incidents. Potential infrastructure threats detection.



# 4₃ Case: Engineering calculations automation and optimization

**Case**

The company, profiling on engineering calculations for heating networks of city level, has time expenses of 3 months average for every case of an optimization calculation and explanatory notes and documentation creation. Given process involves enormous human resources.

**Tasks & objectives**

Company CTO in collaboration with Orlando Labs decides to create a solution that will automate all routine calculations while powering it up with unachievable before evolutionary multiparametric optimization algorithms. All the documentation must be produced automatically with the output as well.

**Solution**

The solution based on Orlando AUTOMATE includes highly convenient data input interfaces, version-control system, and cloud-based calculations core with custom built-in domain-specific calculations and document-templating languages.

**Result**

Reduction of time expenses up to 80% for initial object calculation, up to 99% on corrective recalculation. Extending the range of services with the brand new forecasting of city-level social-economic effects caused by heating networks modernization planning for the terms up to 20 years. Full liquidation of calculus and documentation errors caused by human factor.

# 4/4 Case: Offline advertisement system with efficiency tracking

**Case**

Some international company owns an extensive network of advertisement media screens located in Russia and former USSR countries. The control over the system is partially manual. The advertisement content changes through remote access systems which is extremely ineffective due to the high number of screens to manage in a periodical manner.

**Tasks & objectives**

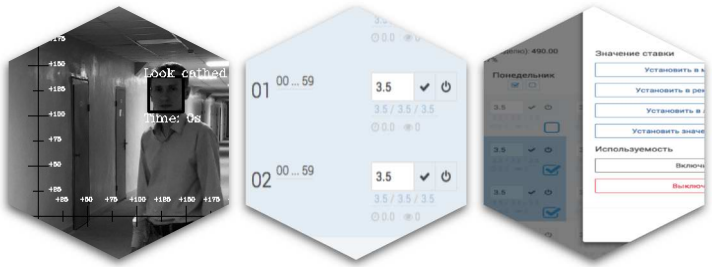
The goal of system redesign is the ultimate automation and simplification of the screen network management. The main tasks are i) the development of the brand new advertisement time management system and ii) the design of hardware upgrade to meet the requirements of new software.

**Solution**

We created a cloud-based service including everything needed for the customer-related data-, work-, and document-flow. Advertisement time management was switched to real-time bidding auction where the advertisement locations became self-regulated in terms of price. Every screen was upgraded with the webcam to track real advertisement efficiency with developed face recognition and eye tracking algorithms.

**Result**

More favorable and transparent advertisement pricing for customers. Robust, fast and fail-safe protocol of centralized network management allowing to automatically distribute new advertisement materials and their rotation rates among multiple locations without human work. Simple and convenient new dataflow has led to much more customers loyalty and satisfaction.



## 5 Contact us

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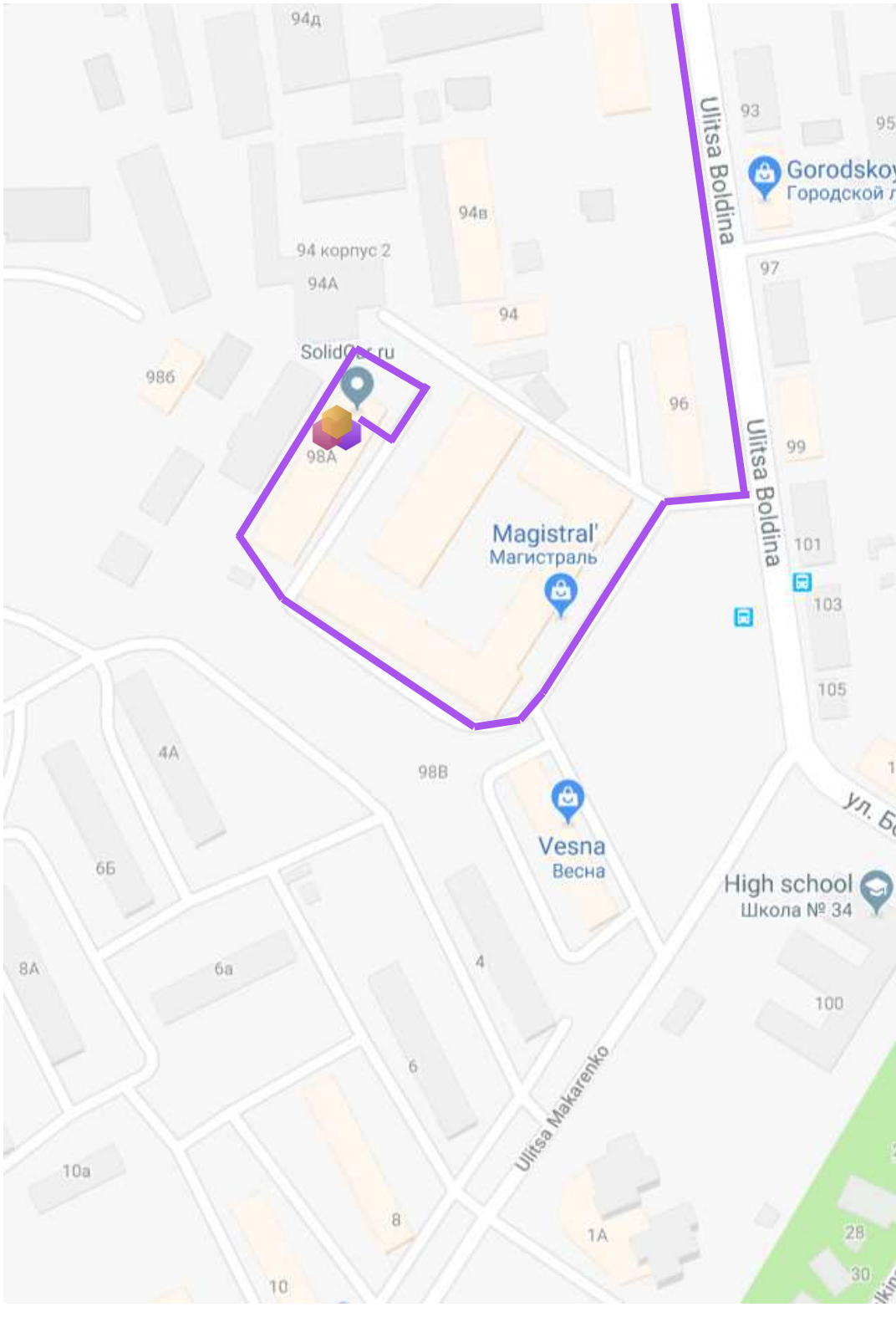


* - Orlando Labs is in progress of achieving residential status of Skolkovo innovation center