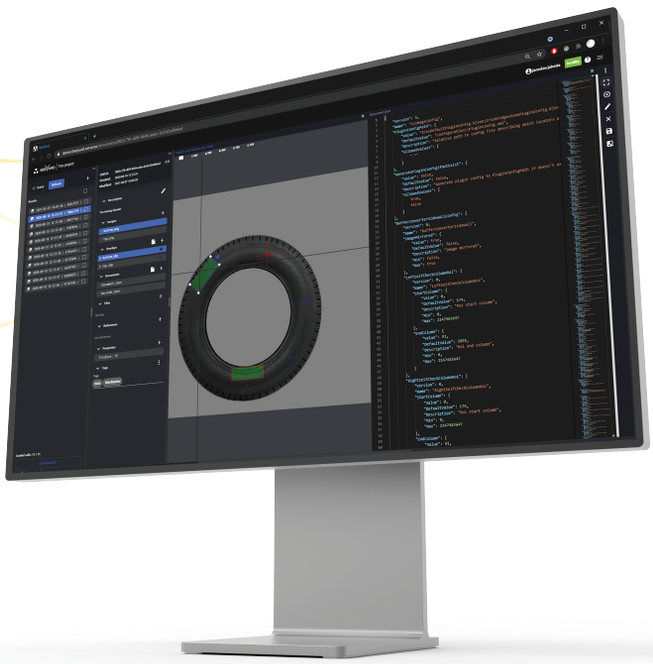
BeeYard



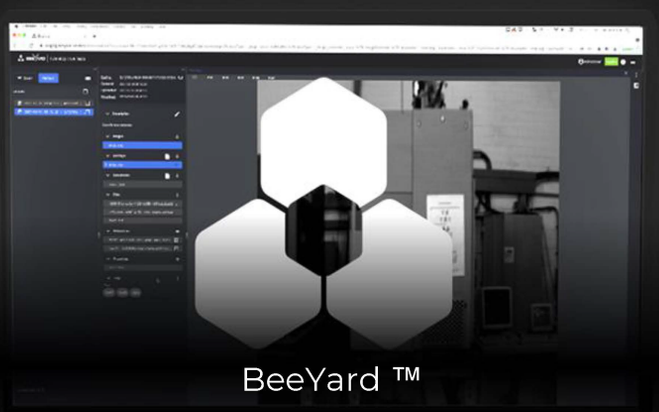
Flexible image-centric **AI/ML engineering platform**

compliant with Industry 4.0 standards with strong **data management** capabilities.

BeeYard supports AI/ML engineers and data scientists throughout the entire MLOps workflow and enables collaboration of all stakeholders within enterprises.

An ultimate solution addressing industrial-grade applications, BeeYard was designed to utilize the maximum amount of variable data from production, including images from industrial optic systems, to build robust AI/ML modules quickly and reliably.

The platform includes support and interoperability of various tools, languages, algorithms, frameworks and data management platforms developed by third parties (especially **open source**)



Integrated support for Halcon by MVTec external machine vision algorithm library

HALCON

and other image processing libraries

Data producers

3D Sensor, Robot, PLC, Sound, Smart camera, MES

SDKs: C#, Python, Lua, R
Gateway: FTP, Halcon

(optional)
BeeYard local storage

Public Cloud: aws, Azure, Google Cloud
Private Cloud: docker, kubernetes

SDKs: C#, Python, Lua, R
Gateway: FTP, Halcon

Data consumers

HALCON, PyTorch, OpenCV, LabVIEW, MATROX IMAGING, W&B, GitHub, scikit-learn

DESIGNED FOR INDUSTRIAL-GRADE MACHINE VISION APPLICATIONS

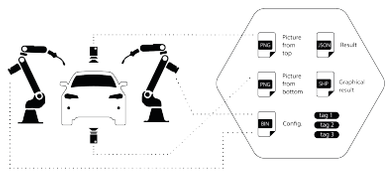
DESIGNED FOR MACHINE VISION

- Large data volumes processing;
- Data collection and storage optimized for ML/AI tasks;
- Contextual data storage - DATA CELL APPROACH;
- Images are tight with context metadata from other sources;
- Hive database storage local or cloud;

INDUSTRIAL MACHINE VISION REQUIRES SPECIFIC APPROACH TO DATA PROCESSING AND MANAGEMENT

Data cell

- A set of all object - related data
- Basic database unit
- Context - driven data storage
- Bound to each object

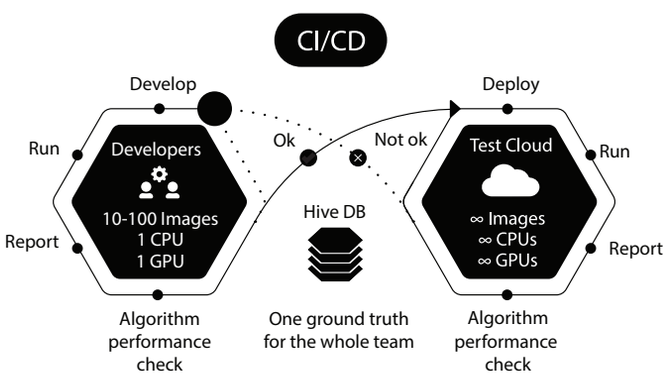


AUTOMATED

BeeYard leverages automation features to accelerate ML/AI systems development:

- AI-assisted labeling.
- Data cleanups;
- Data preparations;
- Pretrained models for principal DL tasks;
- Facilitate finetuning of these models;

ACCELERATE THE MLOps WORKFLOW AND GET RID OF TIME-CONSUMING MANUAL TASKS



BeeYard is designed to be embedded into CI/CD pipeline.

DATA PREPARATION

Annotation jobs

- All types of annotations required in industrial field;
- Coordination between annotators;
- Can be distributed to annotators anywhere with;
- Access rights management.

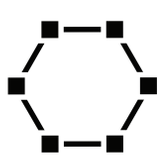
Image preprocessing. Image augmentation

- Images and annotations are already in the correct format to be fed to whatever computer vision algorithm or deep learning model.

Batch operations on images:

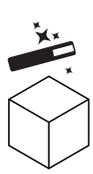
- Eliminate repetitive annotations by applying it to a batch of images in one shot.

THE QUALITY OF MACHINE VISION ALGORITHMS STARTS WITH VALID AND CONSISTENT DATASETS

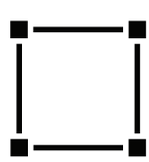


Polygon selections

Key points

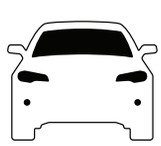


AI assisted labeling



Bounding boxes

Label classes

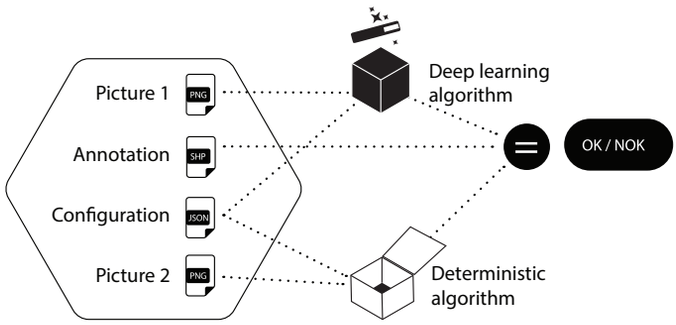


Semantic segmentation

COMPOSITE AI CAPABILITY

- Large data volumes processing;
- Data collection and storage optimized for ML/AI tasks;
- Contextual data storage - DATA CELL APPROACH;
- Images are tight with context metadata from other sources;
- Hive database storage local or cloud.

DEEP LEARNING IS NOT A SILVER BULLET, ESPECIALLY IN MANUFACTURING

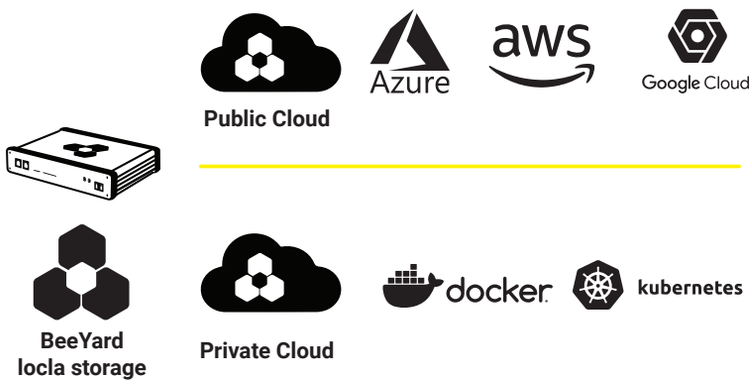


HYBRID CLOUD SOLUTION

BeeYard supports hybrid scenarios of data collection and storage:

- Edge;
- On premise;
- Public or private Cloud;
- Or a combination.

BE COMPLIANT WITH INTERNAL CONSTRAINTS AND POLICIES ON DATA GOVERNANCE AND SECURITY



COLLABORATIVE CAPABILITIES

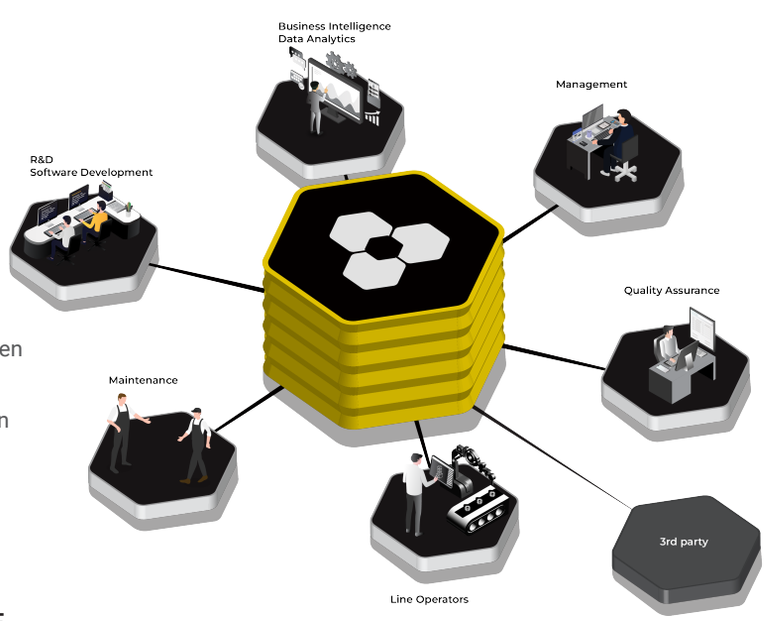
Collaboration of all involved parties, team members, 3rd parties at all stages of machine vision projects:

- Audit logs;
- Versioning;
- Access rights;

Collaborative annotations

BeeYard serves a communication tool for the dialogue between domain experts (in-house teams) and data scientists (inhouse/3rd party) party), typically quality managers who can label or annotate pictures directly in the platform.

INVOLVE DIFFERENT USERS TO PARTICIPATE ON THE MACHINE VISION PROJECTS



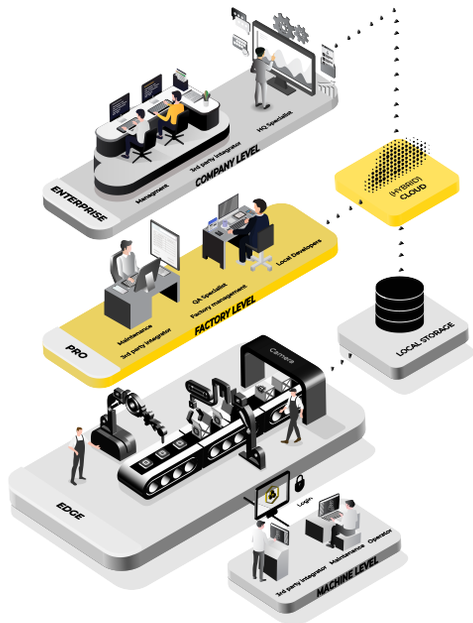
SCALABLE ARCHITECTURE

Deploy BeeYard from the local edge up to enterprise level utilizing cloud storage:

- EDGE level
- FACTORY level
- ENTERPRISE level

* Optional BeeYard EDGE device for the collection of data from the edge devices as part of the BeeYard product family.

SCALABLE ARCHITECTURE ENABLES TO PROPAGATE DATA FROM THE EDGE UP TO THE ENTERPRISE LEVEL FOR FURTHER PROCESSING OR ANALYSIS



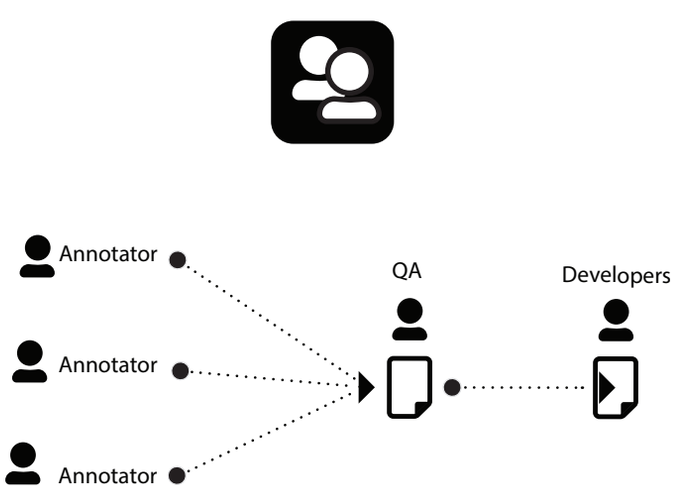
DATA MANAGEMENT & SECURITY

- ACCESS RIGHTS
- USER MANAGEMENT
- AUDIT LOGS
- VERSIONS

SECURITY:

- Protection against the loss of data,
- Automated backups,
- Synchronization between multiple devices,
- Easy data transfer,
- Restore capabilities,
- Security compliance.

MANAGE WHO CAN MANIPULATE WITH YOUR DATA AND IN WHAT WAY, ESPECIALLY WHEN A WIDE THE AUDIENCE HAS ACCESS RIGHTS

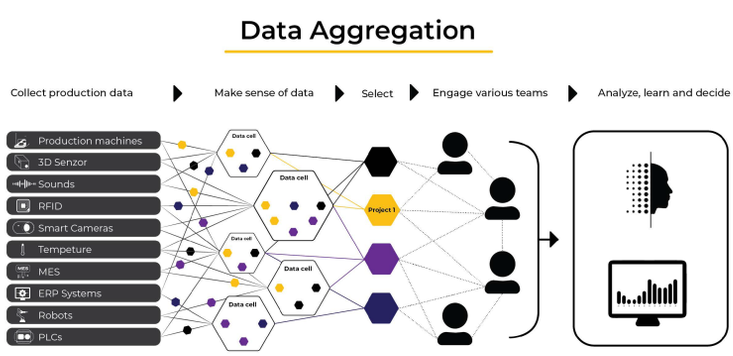


DATA MINING

Easy access to the correct and specific data:

- easy aggregations,
- queries management,
- insights on data,
- tools to output statistics of the data,
- automated tests on specific batches of data,
- possibility to add properties to data such as sensor
- measurements, date and time, dimensions etc.

EASY ACCESS TO RELEVANT PRODUCTION DATA FROM VARIOUS SOURCES



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