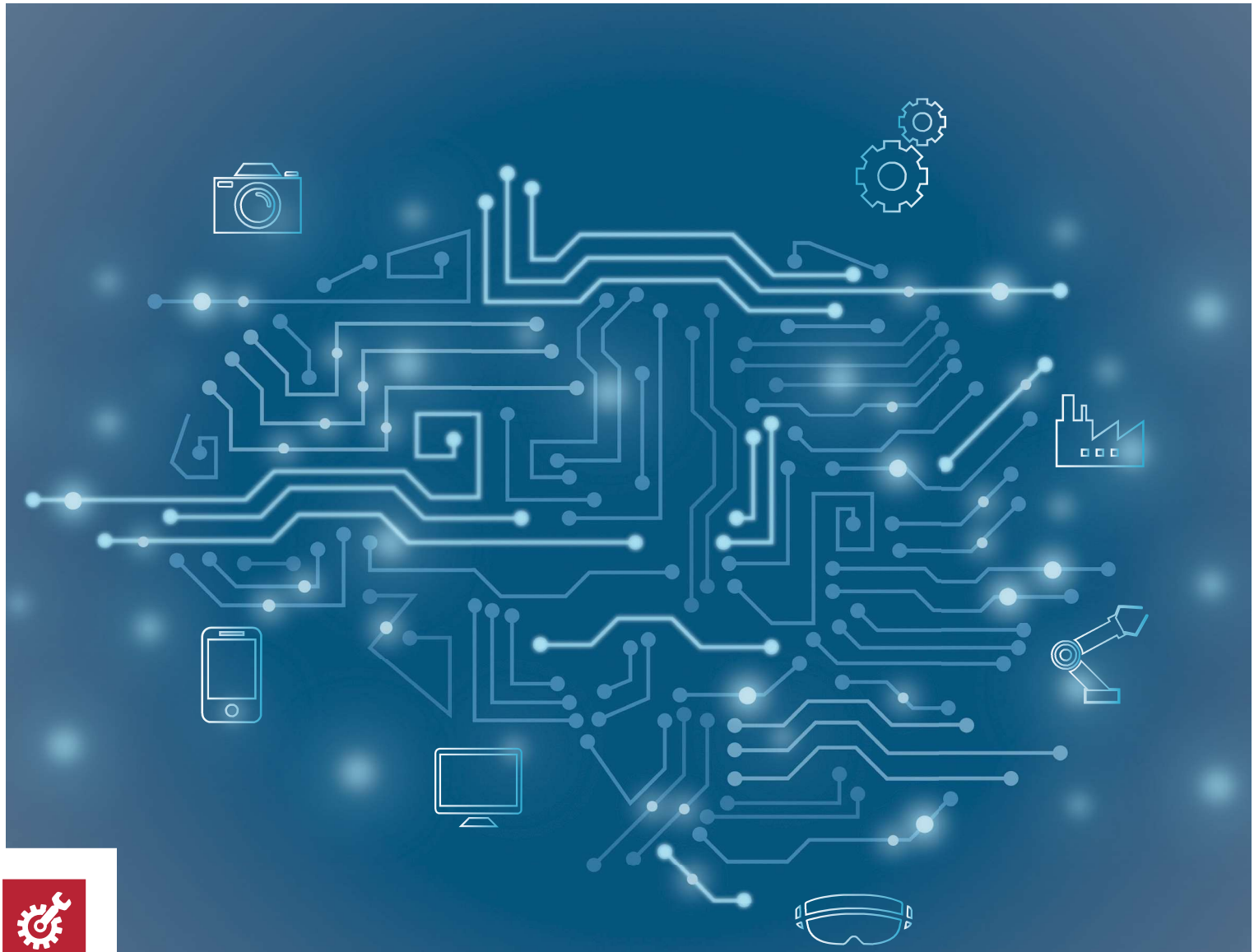


RCV

Software and Solution Platform for Computer Vision

robotron®

REALTIME COMPUTER VISION

for Quality Control Inspections and Process Optimization

RCV is a modular platform that facilitates the use of Artificial Intelligence (AI) and highly-sophisticated **deep learning algorithms** to implement diverse Computer Vision use cases such as **Image Classification, Object Detection** and **Image Segmentation**.

All components of the ***RCV*** platform are designed and built on container-based virtualization and can therefore be installed on-premises, in the cloud or even in a hybrid environment. By adopting ***RCV***, you gain access to new areas that were previously subject to limitations of conventional imaging (such as grayscale transformation). By utilizing ***RCV***, for example, test processes can be accelerated, and reaction times can be minimized during final assembly based on Artificial Intelligence. With easy calibration and transferability, the ***RCV*** platform offers customizable solutions for your application.

Advantages of the ***RCV*** Software and Solution Platform

- ✓ Data enrichment using other systems (MES etc.)
- ✓ Audit-proof data storage for re-traceability
- ✓ Extendable interfaces for customized solutions
- ✓ Hardware-independent
- ✓ Integration of the latest deep learning frameworks
- ✓ Cross-location networking/collaborative work environment
- ✓ Development efforts only for customer specific adaptations
- ✓ Basic background knowledge is sufficient for usage
- ✓ Appealing operational and billing models
- ✓ Fast deployment

Features


Modular Platform
Scalable
Automated
Tool Chain
IoT
Microsoft Azure IoT Edge
Framework compatible
Easy Deployment
Integrated Model
Training
Operational on-premises/in
the cloud/hybrid
environment
Multi-Framework Support

APPLICATION FIELDS

Model Training and Deployment

Our modular solution offers the greatest possible flexibility in the implementation of all use cases in the context of Computer Vision. Whether it is the optimization of quality control inspections or the detection of objects - ***RCV*** provides a wide range of services for ongoing operational problems. With an integrated tool chain that can be run as a cloud application, on-premises or in a hybrid environment, your organization has the optimal foundation for collaborative work. Learn more about the specific use cases and let us convince you with selected success stories.

Quality Control Inspection

- Control of material and process-related surface defects (e.g. detection of cracks, scratches, pores, damage and contamination of components)
- Final assembly inspection of components or products

Completeness Check

- Container detection in logistics using a drone
- Label and barcode recognition in logistics
- Optical final assembly inspection using Android app

Object Detection

- Automated commissioning of components
- Test for shape, structure, color or texture of the components

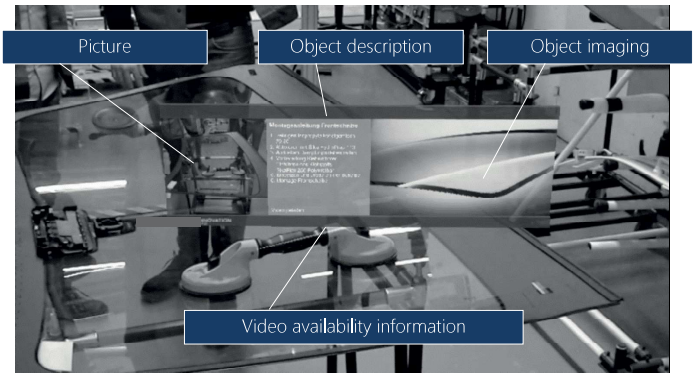
Location Detection

- Positioning
- Orientation (e.g. container detection in logistics using a drone, label and barcode recognition)

Success Stories

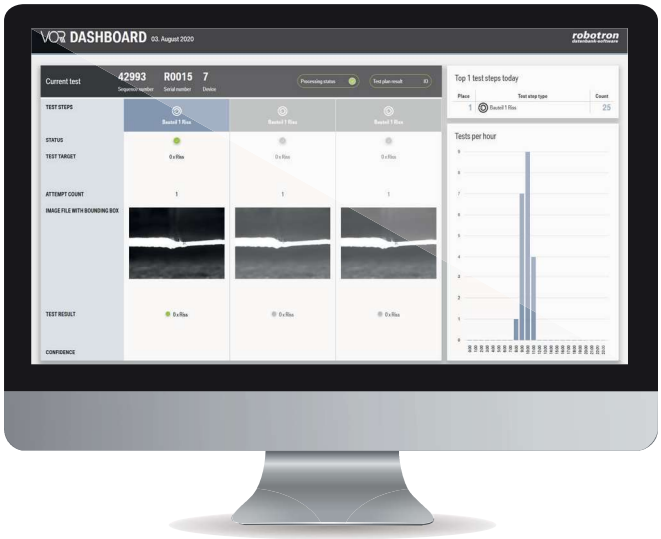
Augmented Assembly with Microsoft HoloLens®

Realtime Computer Vision is used in the final assembly inspections by an automobile manufacturer. In combination with Microsoft HoloLens®, the ***RCV*** solution enables a hands-free and voice-controlled application for object recognition in real time and the virtual display of information during the production process. By proactively providing information and recommendations for the recognition of components, the solution contributes to increasing efficiency and operational reliability, thereby improving quality and reducing costs.



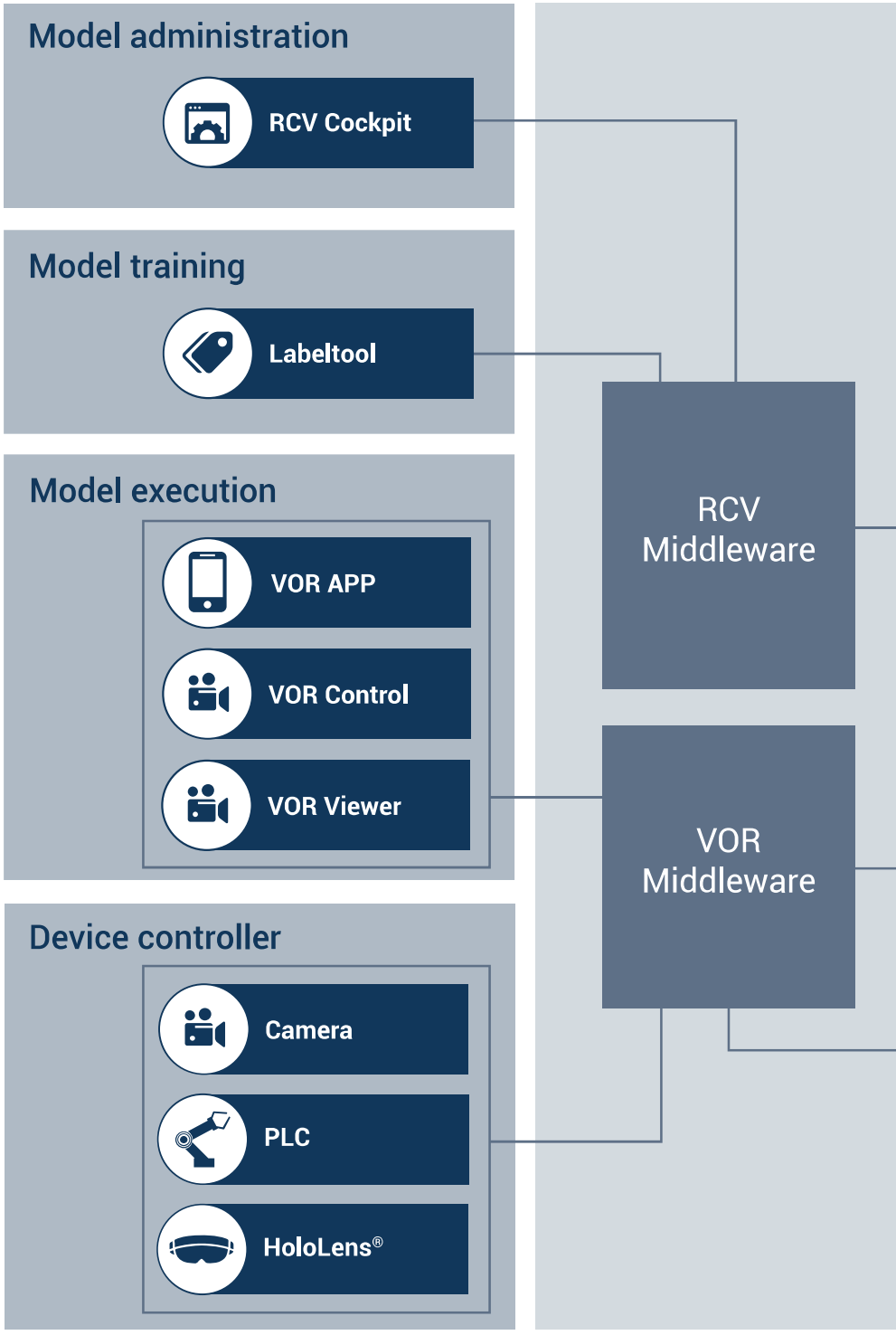
Crack detection at a sheet metal stamping plant

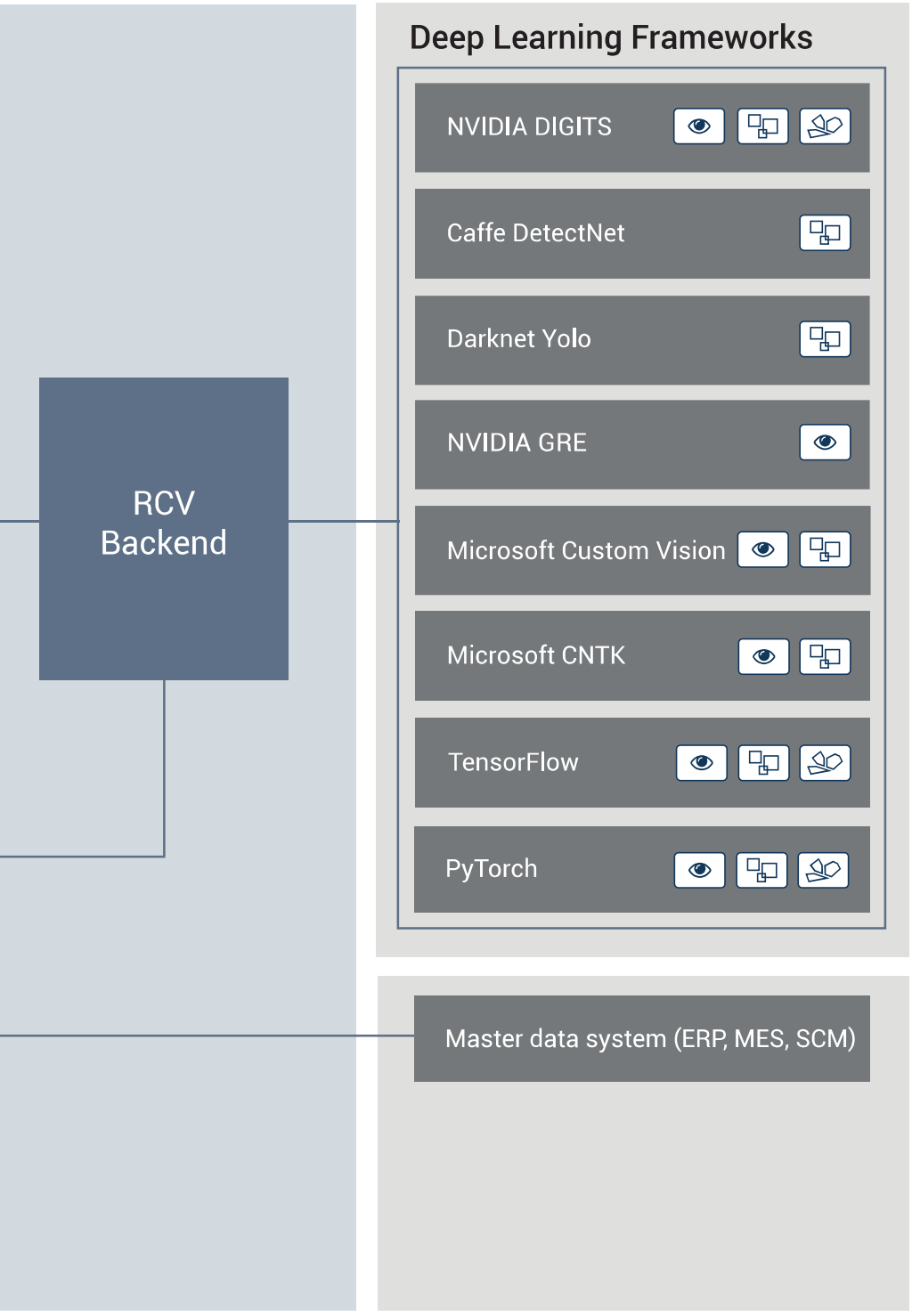
RCV supports quality control inspections in the stamping plant of an automobile manufacturer. A complex object detection model reliably detects cracks in faulty stampings while ignoring other, previously incorrectly identified defects such as dirt/stain. Additionally, a robotic controller placed downstream removes the defective parts from the process. By using the ***RCV*** solution, the error rate has been significantly reduced and pseudo-errors as well as manual follow-up checks have been avoided. Furthermore, the detection of pseudo-errors allowed us to pinpoint anomalies in preceding process steps.



OVERVIEW *RCV* PLATFORM

Architecture



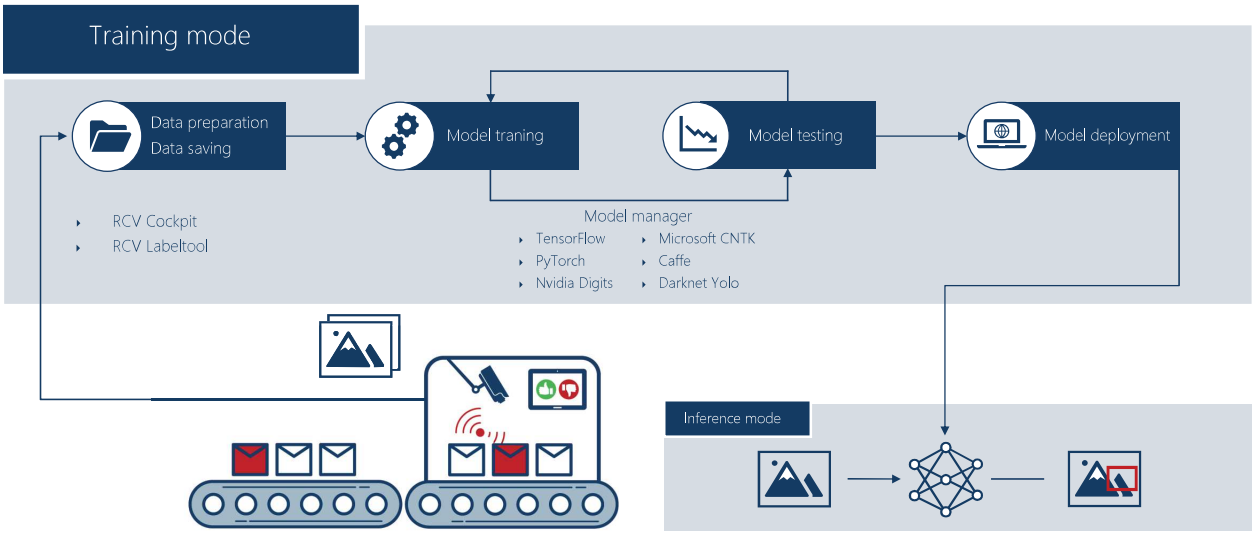

Deep Learning Frameworks
NVIDIA DIGITS
Caffe DetectNet
Darknet Yolo
NVIDIA GRE
Microsoft Custom Vision
Microsoft CNTK
TensorFlow
PyTorch
RCV Backend
Master data system (ERP, MES, SCM)

FROM IMAGE TO MODEL

Model-training and -deployment

The ***RCV***-Cockpit is the central monitoring site for data and model administration, with which we can extend the training data stock by integrated image augmentation methods. Our AI experts first select the optimal deep learning framework and associated model based on the available images. Then, in an iterative process, models are configured, trained and their performance is evaluated using previously defined test data. Finally, the model with the best generalizability is made available for operational use.

RCV-Tool-Chain

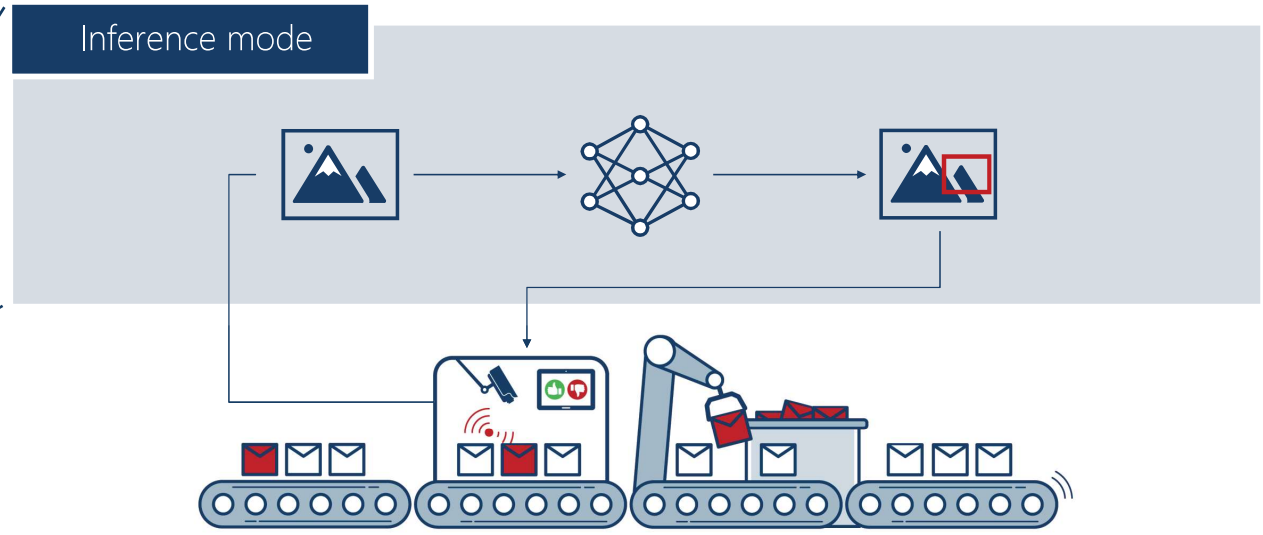


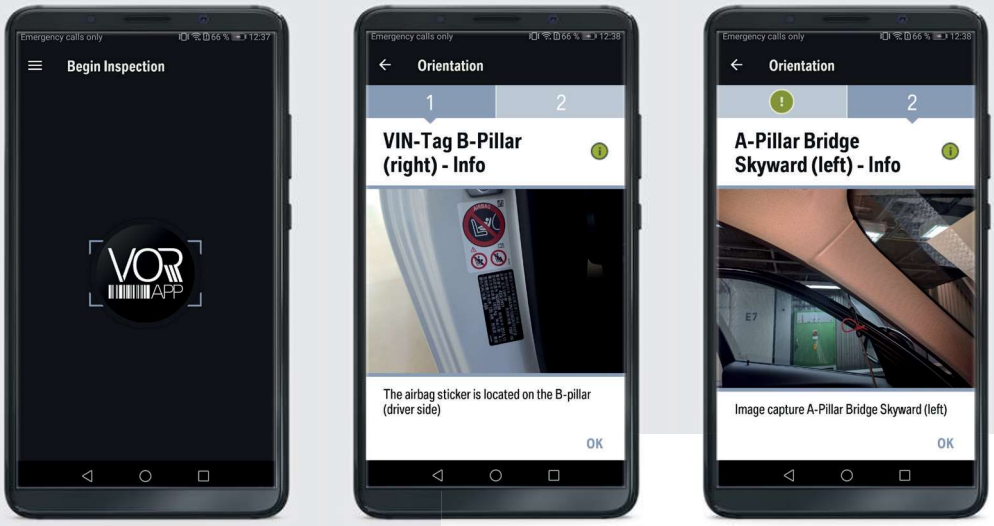
Labeltool and TensorBoard for Image Classification, Object Detection and Image Segmentation

Model Application and Operation Control

Upon deployment of the trained model in production, the entire operation from image acquisition to processing and evaluation (= inference) are fully automated. The model can be deployed and executed locally or in the cloud. The provisioning of an interactive interface (VOR App and/or VOR Viewer) offers the customer full flexibility in the use of ***RCV*** and enables the visualization and configuration of test plans, the import of data from external sources (MES) as well as the display and archiving of results. Furthermore, standardized interfaces for machine control (Modbus, TCP/IP, Profinet) are also available for automated removal of faulty parts from the process.

Application of the Model





Optical final assembly inspection using Android app

VALUE ADDED BENEFITS

of the Solution

QUALITY IMPROVEMENT

COLLABORATIVE WORK-ENVIRONMENT

PROCESS EFFICIENCY

OPTIMIZED PRODUCT

QUALITY CONTROL COSTS REDUCED / APPEALING USAGE MODEL

FUTURE-PROOF SCALABILITY OF DEEP LEARNING FRAMEWORKS

FLEXIBLE DATA STORAGE

robotron®

Robotron Datenbank-Software GmbH
Headquarters
Stuttgarter Straße 29
01189 Dresden
Germany

Phone: +49 351 25859-0
E-mail: info@robotron.de
www.robotron.de

Robotron Datenbank-Software GmbH
Training Center
Heilbronner Straße 21
01189 Dresden
Germany

Phone: +49 351 25859-2660
E-mail: schulung@robotron.de
www.robotron.de/schulungszentrum

Switzerland
Robotron Schweiz GmbH
Zürcherstrasse 65
9500 Wil
www.robotron.ch

Czech Republic
Robotron Database Solutions s.r.o.
Rohanské nábřeží 678/23
186 00 Praha 8 – Karlín
www.robotron.cz

Russia
000 Robotron Rus
Tverskaya st. 16, building 1
125009 Moskau
www.robotron-rus.ru

CONTACT US!

Version: 08/2020

robotron®