



# HALCON

a product of MVTec



EN

BENEFIT FROM SHORT  
RELEASE CYCLES WITH  
HALCON PROGRESS



**NEW**  
VERSION  
**22.05**

## New Features in HALCON 22.05

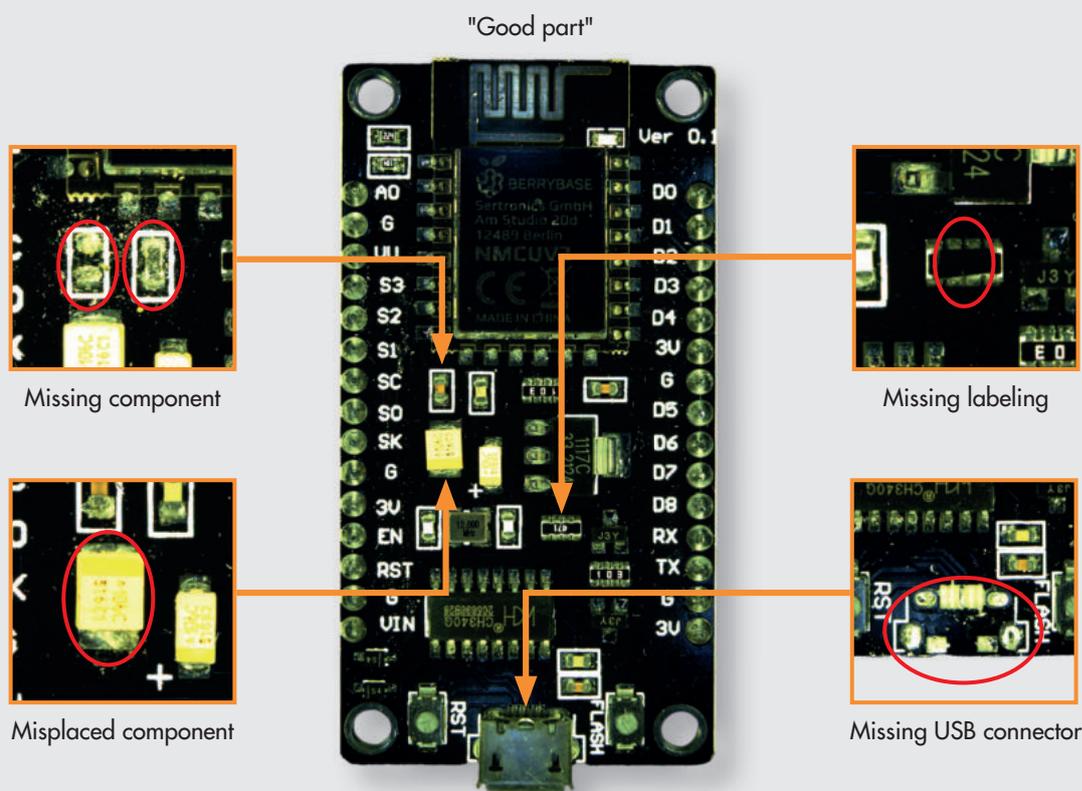
**WORLD  
FIRST**

### UNDERSTANDING AN IMAGE'S LOGICAL CONTENT WITH GLOBAL CONTEXT ANOMALY DETECTION

HALCON 22.05 opens up completely new application possibilities with the detection of logical anomalies in images. This is the further development of the deep learning technology anomaly detection.

Until now, it was possible to detect local, structural anomalies. The new "Global Context Anomaly

Detection" is a one-of-a-kind technology, which is able to "understand" the logical content of the entire image. Just like HALCON's existing anomaly detection, the new "Global Context Anomaly Detection" only requires "good images" for training, eliminating the need of data labeling. This technology makes it possible to detect entirely new variants of anomalies like missing, deformed, or incorrectly arranged components. It opens up completely new possibilities: For example, the inspection of printed circuit boards in the semiconductor production or the inspection of imprints.

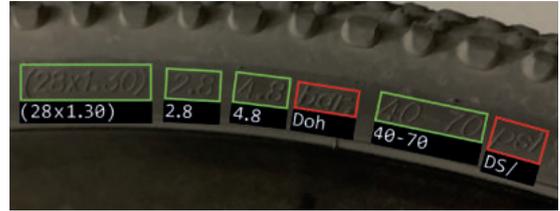


The new "Global Context Anomaly Detection" feature is currently the only technology that can "understand" the logical content of the entire image. It allows even very subtle anomalies to be detected, as this example of an electronic board shows. In the middle, there is a defect-free board – the zoomed-in areas show various subtle defects detected by the new "Global Context Anomaly Detection".



### DEEP OCR TRAINING

HALCON's Deep OCR enables users to efficiently solve text reading applications in a multitude of use cases. With HALCON 22.05, this technology is extended by training functionality, enabling application-specific training on the user's own application dataset. This allows you to solve even most complex applications like reading text with bad contrast (e.g., on tires). Another advantage is that very rarely used special characters or printing styles can also be trained. Training for Deep OCR significantly improves the performance and usability and makes applications run even more robust.



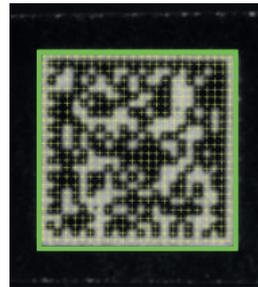
Reading text with bad contrast and lighting conditions on tires without ...



...and with the new Deep OCR training.

### IMPROVED PRINT QUALITY INSPECTION FOR ECC 200 CODES

Print Quality Inspection (PQI) refers to the evaluation and grading of certain aspects of printed bar and data codes according to international standards. For example, it indicates how reliable a code can be read by various code readers or how stable the print quality is in a manufacturing process. HALCON supports various standards for grading the print quality of 1D and 2D codes. With HALCON 22.05, the PQI of data codes has been further improved. It is now up to 150% faster. In addition, the module grid determination for print quality inspection of ECC 200 has been improved. Last but not least, the usability of the PQI of data codes has been improved by introducing a new procedure that provides the grades.

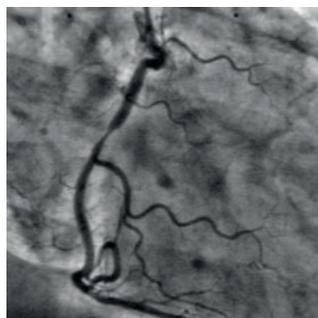


Grading Results	
'Overall Quality'	2
'Contrast'	4
'Modulation'	3
'Fixed Pattern Damage'	2
'Decode'	4
'Axial Nonuniformity'	4
'Grid Nonuniformity'	4
'Unused Error Correction'	3
'Reflectance Margin'	2
'Print Growth'	4
'Contrast Uniformity'	0.2588
'Format Information'	4
'Version Information'	'N/A'
'Aperture'	0.8

The determination of the module grid for print quality inspection of ECC 200 is now much more robust.



Original image



Contrast improved using adaptive histogram equalization

### NOTABLE QUALITY-OF-LIFE IMPROVEMENTS AND SPEED-UPS

With HALCON 22.05, various improvements are released. One example is a new operator that performs adaptive histogram equalization to improve contrast locally in an image. This helps to extract significantly more information from images with low contrast, especially in case of inhomogeneous gray value gradient. Besides, the HALCON library has been extended with a new operator which allows image smoothing with arbitrarily shaped regions. Furthermore, another new operator allows you to transform 3D points using a rigid 3D transformation that is specified as a dual quaternion. And finally, HDevelop's Matching Assistant now generates the code based on Generic Shape Matching.

## Try HALCON FOR FREE!

Download HALCON and contact your distributor for a free evaluation license or use our free application evaluation service.

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### What Is HALCON?

MVTec HALCON is the comprehensive standard software for machine vision with an integrated development environment (HDevelop) that is used worldwide. It enables cost savings and improved time to market. HALCON's flexible architecture facilitates rapid development of any kind of machine vision application.

### What Is Included?

MVTec HALCON provides outstanding performance and a comprehensive support of multi-core platforms, special instruction sets like AVX2 and NEON, as well as GPU acceleration. It serves all industries, with a library used in hundreds of thousands of installations in all areas of imaging like blob analysis, morphology, matching, measuring, and identification. The software provides the latest state-of-the-art machine vision technologies, such as comprehensive 3D vision and deep learning algorithms.

### What Is HALCON Progress?

HALCON Progress is the fast track to the latest features. With new releases approximately every six months, it gives you access to the newest features quicker and more frequently than ever before. These short release cycles are only available via an annual subscription.

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### Why HALCON?

The software secures your investment by supporting a wide range of operating systems and providing interfaces to hundreds of industrial cameras and frame grabbers, in particular by supporting standards like GenICam, GigE Vision, and USB3 Vision. By default, MVTec HALCON runs on Arm®-based embedded vision platforms. It can also be ported to various target platforms. Thus, the software is ideally suited for the use within embedded and customized systems.