HALCON

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MVTEC BRINGS HALCON'S CORE TECHNOLOGIES TO THE NEXT LEVEL

NEW VERSION 24.11

MVTec brings HALCON's core technologies to the next level

HALCON 24.11 introduces a range of new and improved features designed to further enhance your machine vision performance. It is available for both the Steady and Progress editions.

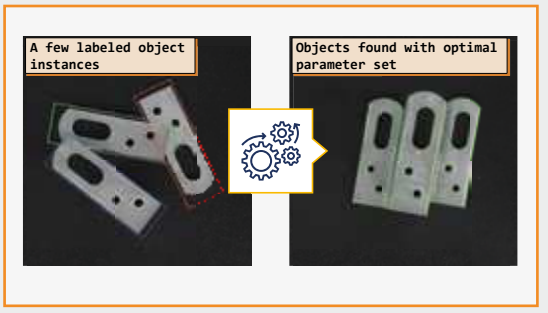
New features in HALCON 24.11

OUT OF DISTRIBUTION DETECTION (OOD) FOR CLASSIFICATION

This new HALCON feature makes it easy to recognize unexpected behavior caused by incorrect classifications in production. Thus, users can take appropriate measures, such as stopping the machine, in a targeted and efficient manner. During classification within a machine vision system, unknown objects are assigned to one of the classes that the system has learned. This can lead to problems if, for example, the defects or objects themselves are of a type that has never occurred before. The new deep learning feature “Out of Distribution Detection (OOD)” indicates when an object is classified that was not included in the training data. For example, this could be a bottle with a green label if the system was only trained on bottles with red or yellow labels. In this case, HALCON provides the message “Out of Distribution” together with an OOD score that indicates how much the deviation from the trained classes is.

IMPROVED SHAPE-BASED MATCHING

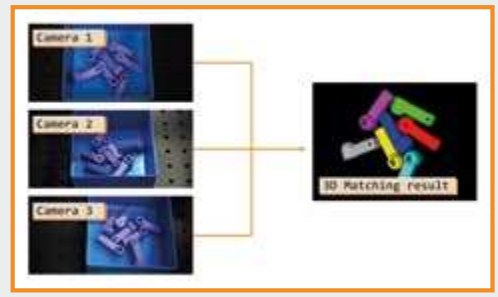
The new HALCON version makes the “Shape-based Matching” feature used in many applications more user-friendly. This technology is used to find objects fast, accurately, and precisely. HALCON 24.11 includes the new patent pending "Extended Parameter Estimation" for this purpose. This allows parameters to be estimated with greater granularity, which significantly speeds up execution in some applications. “Extended Parameter Estimation” enables this estimation also for users without in-depth machine vision expertise.



OPTIMIZED QR CODE READER

The performance of HALCON's QR Code Reader has been significantly increased. This is particularly evident under difficult conditions, for example, when many codes need to be found in the image area or many textures in the image complicate the detection. The recognition rate has been increased and the evaluation time has been significantly reduced in demanding scenarios.

DEEP 3D MATCHING



With this feature, HALCON 24.11 contains a deep-learning-based market innovation for the 3D vision sector, especially for bin-picking and pick-and-place applications. This feature is particularly robust in determining the exact position and rotation of a trained object and is characterized by very low parameterization effort and fast execution time. Depending on the accuracy requirements, one or more cost-efficient standard 2D cameras can be used to determine the position. Training is performed exclusively on synthetic data generated from a CAD model. Further training is therefore not required. Customers can already run this feature in HALCON 24.11 – to train the model and evaluate applications, they can contact MVTec at any time. Training and evaluation within HALCON will follow in the next release.

PREVIEW OF THE NEW IDE HDevelopEVO

HALCON 24.11 has a special highlight for all users of HALCON's own integrated development environment (IDE) HDevelop: a preview of the new IDE HDevelopEVO. This is characterized, among other things, by a more modern, intuitive user interface and an improved editor (i.e., the central programming element). The latter enables faster and more efficient programming and prototyping of machine vision applications. Users can already extensively test the new development environment in HALCON 24.11. The range of functions of HDevelopEVO will be continuously expanded in the coming releases until it completely replaces HDevelop.

FURTHER IMPROVEMENTS

HALCON Progress is now fully compatible with the HALCON Steady edition. This means that Progress and Steady users can now work on the same projects together. HALCON Progress users now also receive the same updates as HALCON Steady users and in future it will be sufficient to exchange the respective license file to switch from Steady to Progress.

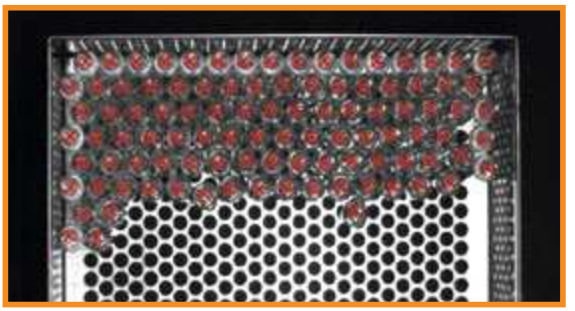
With this release, HALCON's GigE Vision interface furthermore supports the RoCEv2 network protocol, which enables increased performance in image transmission.

Further highlights of HALCON 24.11

Experience HALCON's new and balanced feature set and profit from field-proven and mature technologies.

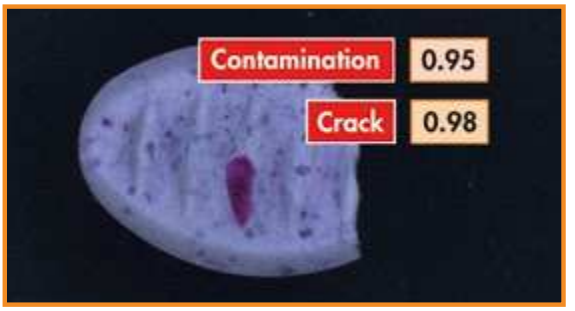
DEEP COUNTING

With Deep Counting, a feature is available to customers that can be used to count a large number of objects quickly and robustly as well as to detect their position. The deeplearning- based technology offers significant advantages over existing machine vision methods: The feature can be deployed very quickly, since only very few objects need to be labeled and trained – both steps can be easily done within HALCON. The technology provides reliable results even for objects of highly reflective and amorphous material. With Deep Counting large numbers of objects such as glass bottles, tree trunks, or food can be counted.



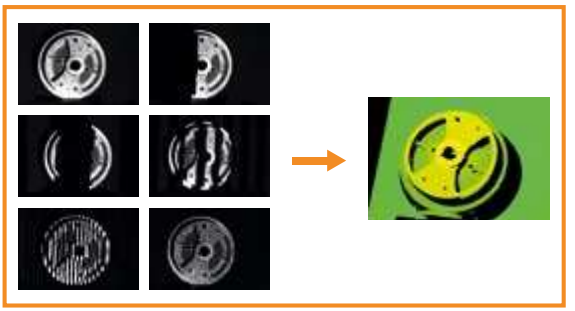
MULTI-LABEL CLASSIFICATION

Customers now have access to multi-label classification, a new deep learning method that allows the recognition of multiple different classes for a single image. Such classes can encompass various properties of the objects within the image, for example defect types, color, or structure. In practice, this method can, for instance, reveal the presence of different types of defects in an image, allowing a more detailed classification. Compared to other methods, this deep learning method is faster in processing and the effort for labeling is also lower.



STRUCTURED LIGHT 3D RECONSTRUCTION

HALCON's structured light model has been enhanced: Besides deflectometry, it now also provides precise 3D reconstruction for diffuse surfaces in short cycle times. This enhancement gives users the flexibility to develop their own application-specific 3D reconstruction systems using a pattern projector and a 2D camera. The feature is particularly suitable for applications where precise spatial representations are required. As a result, the technology is suitable for the optimization of manufacturing processes, quality control, and the precise measurement of various surfaces.



TRAINING FOR DEEP OCR – DETECTION

Deep OCR reads texts in a very robust way, even regardless of their orientation and font. For this purpose, the technology first detects the relevant text within the image and then reads it. It is now also possible to fine-tune the text detection in HALCON by retraining the pretrained network with application-specific images. This provides even more robust results and opens new application possibilities. For example: the detection of text with arbitrary printing type or unseen character types as well as an improved readability in noisy, low contrast environments.

TRAINING FOR 3D GRIPPING POINT DETECTION

3D Gripping Point Detection can be used to robustly detect surfaces on any object that is suitable for gripping with suction. In HALCON, the customer can retrain the pretrained model with own application-specific image data. The grippable surfaces are thus recognized even more robustly. The necessary labeling is done easily and efficiently via the MVTec Deep Learning Tool.

MVTEC LICENSE SERVER CLOUD READY

All customers now have an additional "cloud-ready" variant of the license server at their disposal. This makes it possible to license HALCON in the environments of commercial cloud providers as well as in enterprise-owned cloud setups without the need for hardware, solely through a network connection. This means that HALCON can now be easily licensed across all cloud solutions. By using HALCON in the cloud, customers can easily benefit from the new possibilities offered by machine vision in the cloud.

AND MANY MORE

- Code reader improvements for stacked bar codes
- Up to 80% faster template matching generators on Arm®-based systems
- Improved accuracy of Global Contect Anomaly Detection
- Import of 3D object models from the STEP file format
- Extended hardware support thanks to an updated OpenVINO™ Toolkit AI² plug-in
- Performance optimization for various core technologies
- Adjustments to many operators to address performance impact resulting from the Intel® resolution of the Down-fall security vulnerability

HALCON

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What is HALCON?

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. Beyond that HALCON comes with free support by the highly experienced experts at MVTec.

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. HALCON Progress development licenses are exclusively available via an annual subscription. A valid HALCON Progress development license grants access to all Progress releases within the subscription period. For more information about our licensing models, please visit **www.halcon.com/editions**

Why HALCON?

HALCON secures your investment by supporting the operating systems Windows and Linux. The full library can be accessed from common programming languages like C, C++, Python, and .NET languages like C# or VB.NET. HALCON guarantees hardware independence by 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 smart cameras and other embedded vision platforms. It can also be ported to various microprocessors / DSPs, operating systems, and compilers. Thus, the software is ideally suited for the use within embedded systems.