



Mech-DLK

Deep Learning Platform Software

Mech-DLK is a versatile and easy-to-use deep learning software for industrial automation. With various industry-leading AI algorithms and an intuitive GUI, it allows users to rapidly train models and easily solve the most demanding applications like overlapping object recognition and classification, high-precision gauge, complex defect detection, etc.

Mech-DLK is designed for warehouses and factories to improve productivity, product quality, and save costs. It's suitable for industries like automotive, home appliances, logistics, customer electronics, etc.

Core Algorithms and Major Scenarios

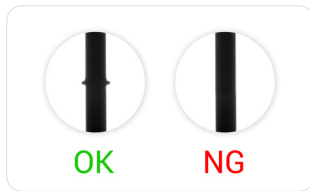
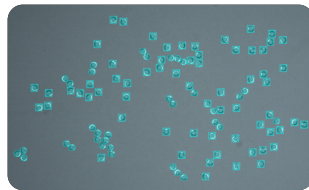


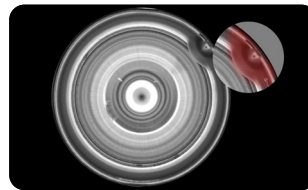
Image Classification

Supports presence & absence detection, front & back detection, defect classification, etc.



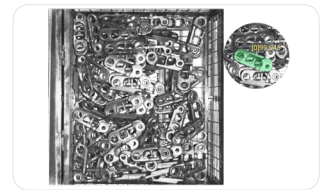
Object Detection

Detects the types, positions, and numbers of specified objects in images.



Semantic Segmentation

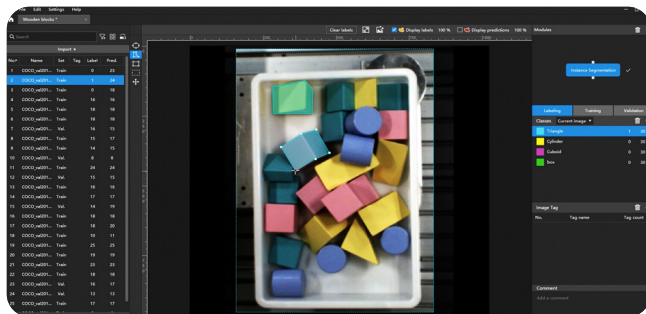
Accurately detects subtle and irregular defects.



Instance Segmentation

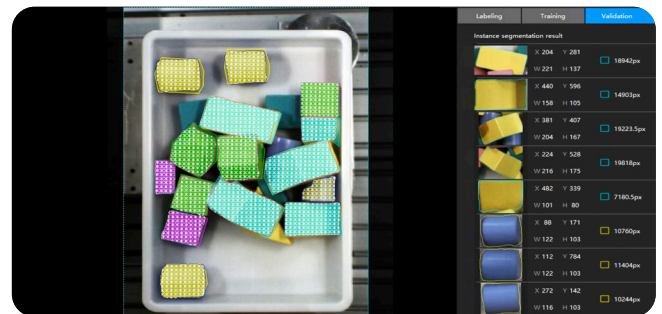
Identifies the specific objects from the bulk, marks the contours, and classifies their categories.

Features



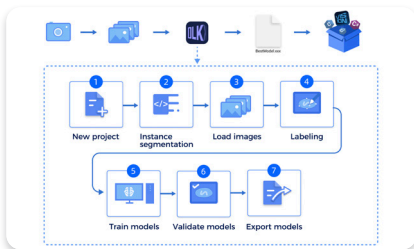
Intuitive Graphical Interface

The graphical interface makes it easier to deploy and use. Users can implement a variety of deep learning applications without technical knowledge.



Visualized Validation Model

Mech-DLK can perform model validation, display validation results, and show the comparison between validation results and the annotation, which helps significantly improve the validation efficiency of vision solutions.



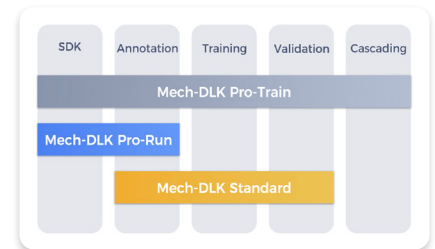
Full-Process Integration

Mech-DLK integrates the whole process of model training, including data management, annotation, model training, model validation, and model export.



Efficient Deployment

Users can deploy applications using Mech-Vision. And it also offers SDKs in multiple programming languages (c, c++, c#, etc.) for customization.



Multiple Versions

Mech-DLK adopts modular function authorization to meet the diverse needs of users; supports deploying on multiple devices after training on one device, significantly saving users' costs.

Benefits of Advanced Algorithms



Small Data Sets

Model training can be completed with only small data sets.



High-Precision Algorithms

The powerful deep learning algorithms guarantee superb accuracy with fewer parameters.



Easy Training Process

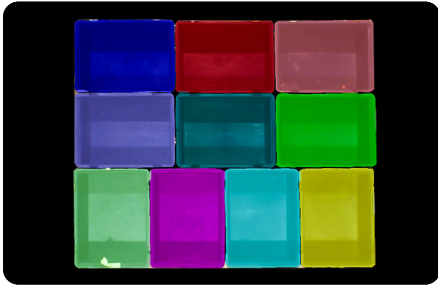
Adaptively adjusting the balance of the positive and negative training samples to make the training converge faster.



Fast Network Inference

The optimized inference process makes faster network inference.

Implemented Applications



No.1 Tote Depalletizing (Recommended Version: Mech-DLK Standard)

Demand

- Classify and precisely locate the specific totes for accurate depalletizing.

Challenge

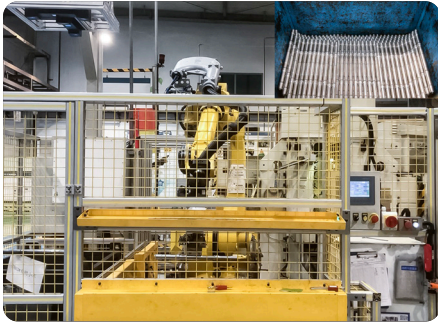
- Totes are thin-walled, unsealed, and tightly-packed, making it challenging to identify the individual totes and prone to mispicks.

Solution

- Mech-DLK trains instance segmentation models of totes.
- Integrated with Mech-Vision to recognize and classify totes that are tightly packed, with uneven surfaces, etc.

Performance

- With Mech-DLK, the recognition accuracy is improved to up to 99.99%. And the fully-automated production line can stable operate without manual intervention, saving costs while improving efficiency significantly.



No.2 Driveshaft Bin Picking (Recommended Version: Mech-DLK Standard)

Demand

- Locate and mark the contours of the reflective driveshafts from the bulk to further guide the robots to accurately pick them.

Challenge

- Driveshafts are reflective and overlapped in the material bin. Sometimes the edges are too blurred to generate complete and clear point clouds, which poses a difficult challenge in precise picking tasks.

Solution

- Mech-DLK can train instance segmentation models of driveshafts. It can match the target objects with their point clouds that are defective.
- Mech-DLK detects and marks the contour of target driveshafts, allowing robots to accurately pick them.

Performance

- With Mech-DLK, robots can easily handle reflective parts that are overlapped in the deep material bin. The 99.99% picking accuracy is guaranteed even when the point clouds are missing or defective.

Recommended Configuration

| | Lite | Basic / Pro |
|-----|----------------------------------|----------------------------------|
| O/S | Win10 | |
| CPU | i5 or higher | i7 or higher |
| RAM | 8G or higher | 16G or higher |
| GPU | GeForce GTX 1650 (4GB) or higher | GeForce RTX 2070 (8GB) or higher |

3D VISION & AI FOR ROBOTS AND MORE



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