Mech-Mind Robotics

AI + 3D Vision Solutions in Logistics

1000+ solutions successfully deployed for world-leading companies in logistics

Depalletizing
Mixed Palletizing
Random Bin Picking
Parcel Induction

Mech-Mind
AI + 3D Vision Pioneer in Logistics

The continuous growth in manufacturing, the rapid increase of e-commerce, and dramatic shifts in customer behavior emphasize the significance of building resilient and sustainable supply chains. Over the past few decades, new business models, robotics & automation, and ever-evolving technology have reshaped the logistics industry.

The industry has arrived in the era of flexible automation relying more and more on **intelligent robot solutions**. Intelligent robot solutions are now widely applied in logistics processes to **boost throughput and cut costs**, helping logistics players **meet growing customer demands**.

Leveraging **3D vision** and **AI technology**, Mech-Mind empowers industrial robots with the new ability for a large variety of tasks and brings logistics automation to a new level. We offer partners and system integrators **comprehensive support from training and marketing to project collaboration**. Mech-Mind has successfully deployed **1000+ solutions** for global system integrators and partners from warehousing to e-commerce.

01

Depalletizing

02

Mixed Palletizing

03

Random Bin Picking

04

Parcel Induction

Mech-Mind AI + 3D Vision Solutions

Vision-Guided Depalletizing

Vision-guided robots depalletize single-SKU pallets or pallets loaded with cases/sacks/totes of mixed weights and sizes.

Capacities

- **Universal pallets and patterns**

  Works with typical pallets (e.g. 1.2 m × 1.2 m × 1.8 m).

  Cases/sacks/totes do not have to be stacked in certain patterns.

  Manages tall pallets (as tall as 2.3 m).

- **Handle edge cases and an unlimited number of SKUs**

  Banded, corrugated, unsealed, wrinkled, angled, or damaged objects;

  Objects with different colors on the flaps and highly reflective tape. Works with edge cases.

  Recognizes thousands of cases/bags/totes.

- **High-speed depalletizing**

  Industry-leading pick rate ensures higher output.

  Advanced multi-pick strategy ensures accurate picking of multiple cases in one grasp.

- **Reliable unloading**

  Collision detection and path planning algorithms guarantee collision-free operation.

Recommended Cameras

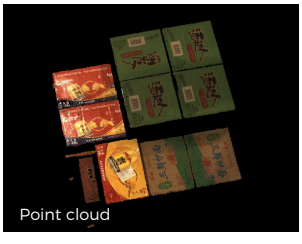
- Mech-Eye DEEP

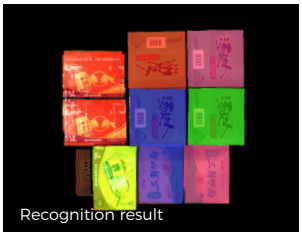
Industries

- Food and beverage, pharmaceutical, e-commerce, groceries, warehousing, etc.

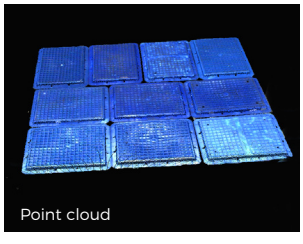
Point Clouds and Recognition Results

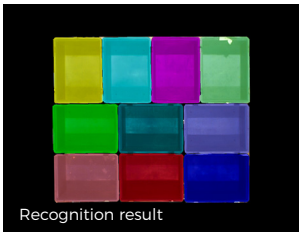
Tightly-stacked cases





Tightly-packed totes





Case Study

Vision-Guided Depalletizing and Palletizing

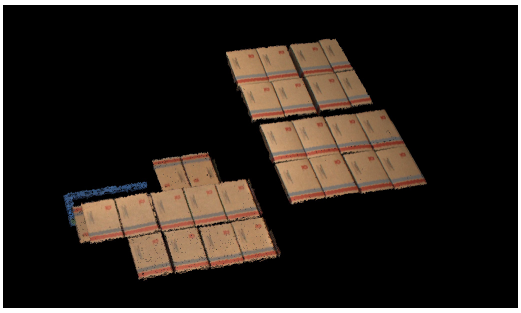
Large manufacturing enterprise

Customer Requirement

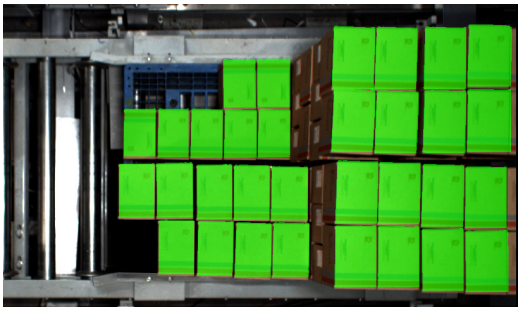
Vision-guided robots can quickly and stably depalletize & palletize high-volume corrugated cartons and foam cases of mixed sizes.

The Mech-Mind Solution

- **One camera, two pallets**: Mech-Eye DEEP is installed on a linear servo to cover two pallets.
- 3D vision system quickly identifies the corrugated cases by reading the fringe orientation.
- The automated robot cell can **autonomously depalletize partial pallets**.
- Quick recognition of new cases **without pre-registration**.
- Works together with **AGV, the conveyor belt, and WMS**.
- **Intelligent path planning and collision detection algorithms** guarantee reliable execution of depalletizing and palletizing.



Point cloud



Recognition result

Results

- The fully automated production line can run stably without manual intervention.

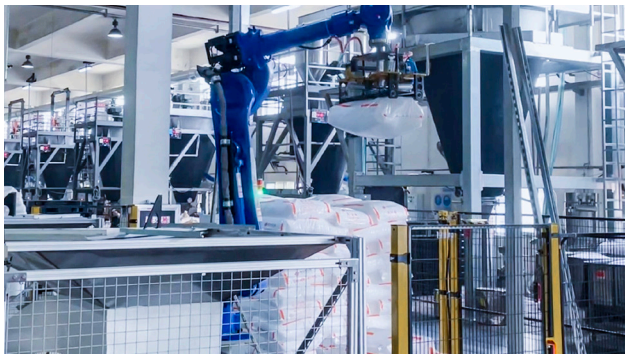
Case Study

Vision-Guided Sack Depalletizing

Large manufacturing enterprise

Customer Requirement

The AI + 3D vision-enhanced robots can handle sacks stacked in irregular patterns and unload deformable sacks quickly and accurately.



The Mech-Mind Solution

- Mech-Eye DEEP is installed above the depalletizing station (Eye to Hand) to cover large pallets.
- 3D vision system supports **sacks with wrinkled, deformed, and patterned surfaces** thanks to advanced deep learning algorithms.
- **Works with bag-breaking machines** to improve overall production efficiency.
- **One capture for one layer**: Imaging the entire layer with only one capture.

Point cloud

Recognition result

Results

- The fully automated production line can run stably without manual intervention.
- Industry-leading pick rate, picking accuracy, and stability meet customer's requirements.

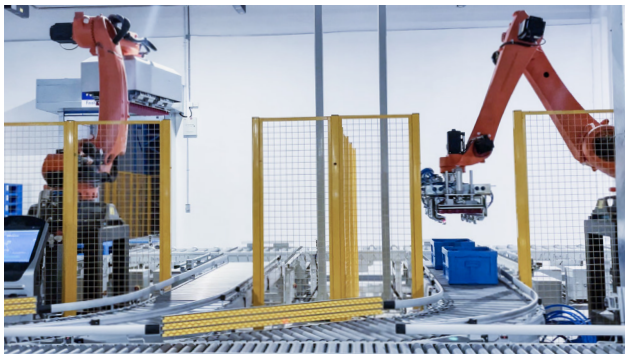
Case Study

Vision-Guided Case and Tote Depalletizing

Large retail company

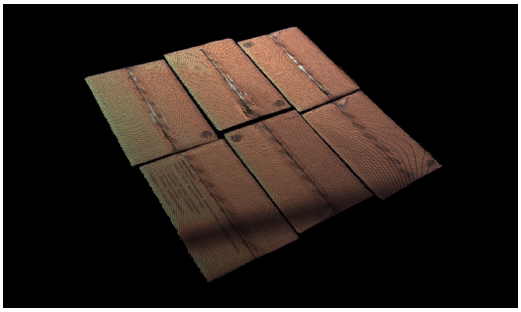
Customer Requirement

The automated robot station can quickly depalletize both cases and totes. Cases are sealed with reflective tapes, while totes are thin-walled and unsealed, all posing a difficult challenge for accurate and stable picking.



The Mech-Mind Solution

- Intelligent picking planning algorithm enables **flexible switching of the end effector** to complete single-piece grasping and multi-piece grasping, fulfilling the customer's expectation of pick rate.
- **Offset picking strategy** combines **partition configuration** to grab the maximum number of cases at one time.
- Works with **AGV, conveyor belts, and WMS systems**.



Point cloud

Results

- Industry-leading pick rate, picking accuracy, and stability meet customer's requirements.

Recognition result

Mech-Mind AI + 3D Vision Solutions

Vision-Guided Mixed Palletizing

Vision-guided robots build stable, multi-SKU, multi-layer pallets with boxes, cases, totes, and more.

Capacities

- **Pack unknown SKUs**

  Banded, corrugated, unsealed, wrinkled, or damaged cases;

  Cases with different colors on the flaps and highly reflective tape.

- **Palletize both online & offline**

  Online palletizing

  Autonomously palletizes a random sequence of cases to create stable pallets.

  Offline palletizing

  Intelligent AI algorithm calculates optimal stacking patterns according to the order information.

- **Build tall and stable pallets**

  Mixed palletizing algorithm combines collision detection and path planning to build tall & stable pallets.

- **Flexible deployment and easy integration**

  Plug-and-play software is easy to use and can be set up right away.

  Mature solutions that seamlessly integrate with AGV, conveyor belt, and WMS.

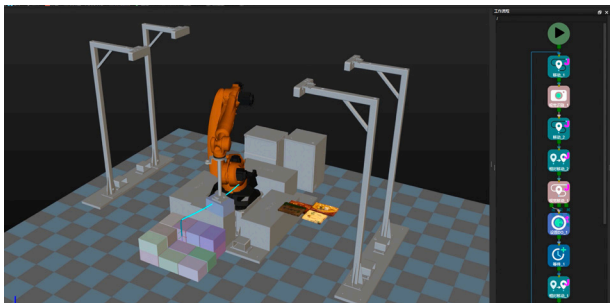
Recommended Cameras

- Mech-Eye DEEP, Mech-Eye LOG

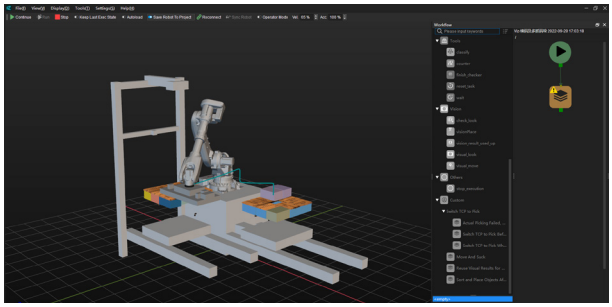
Industries

- Food and beverage, pharmaceutical, e-commerce, groceries, warehousing, etc.

Powerful Algorithms



Mixed palletizing algorithm



Partial pallet palletizing

Case Study

Vision-Guided Mixed-Case Palletizing

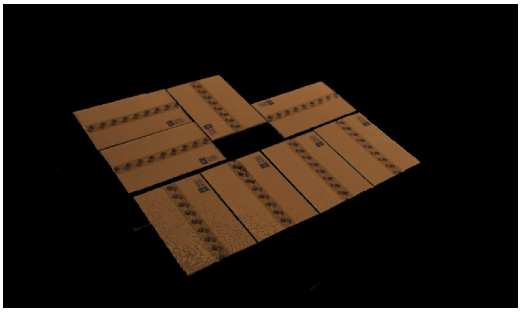
Large food factory

Customer Requirement

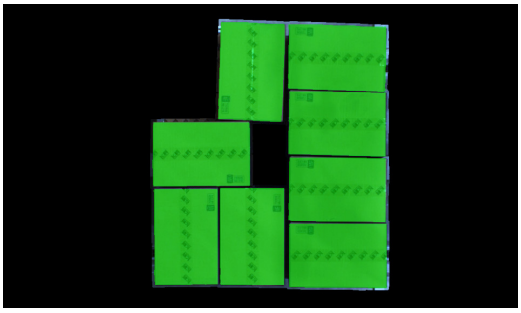
Vision-enhanced robots can quickly create stable multi-SKU pallets with cases, which are bulky and with patterned & uneven surfaces.

The Mech-Mind Solution

- Intelligent algorithm calculates **optimal stacking pattern** according to order information.
- Vision-guided robot builds stable pallets by stacking cases in an alternate order, **preventing collapsing** during transportation.
- Robot can pick and stack multiple cases with the **intelligent multi-pick algorithm**, improving palletizing efficiency.
- 3D vision system autonomously records pallet patterns to guide robots to **continuously stack partial pallets**.
- **Intelligent collision detection and path planning algorithms** guide robots to operate reliably even in a compact space.



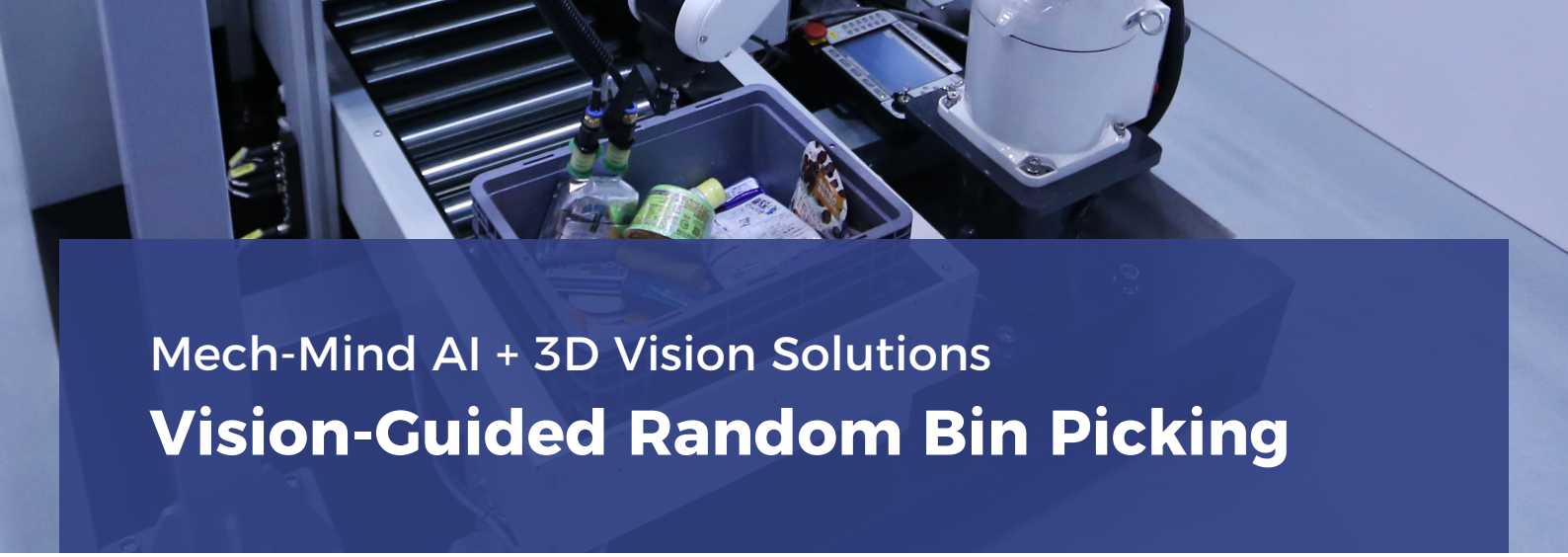
Point cloud



Recognition result

Results

- Mixed palletizing efficiency has been **tripled**, reducing operation and management costs.
- The **overall operational efficiency** of the distribution center **is increased by 40%** and **the cost is reduced by 25%**.



Mech-Mind AI + 3D Vision Solutions

Vision-Guided Random Bin Picking

Vision-guided robots pick random items up and place them at a defined place (e.g. on conveyors for scanning, sorting, etc.) accurately and quickly without damage.

Capacities

- **Pick a vast range of items at high speed**

  Boxes, bottles, poly bags;

  Plastic-wrapped, semi-transparent, multicolored.

  Works with a wide range of materials. Size & shape flexibility.

- **Multi-suction cup end effector**

  Vision-guided robots decide how to best pick each item using the multi-suction cup end effector, ensuring accurate picking and gentle placing.

- **No pre-registration of new SKUs**

  No pre-registration of new SKUs meets the challenges of high-SKU counts and changing inventories.

- **Easy integration**

  Seamless integration with OCR reading system to ensure high-speed order picking.

Recommended Cameras

- Mech-Eye LOG

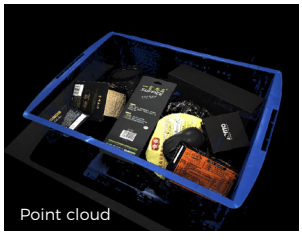
Industries

- Grocery, health & beauty, e-commerce, apparel, etc.

Point Clouds and Recognition Results

Multicolored groceries

Multicolored goods



Case Study

Vision-Guided Piece Picking

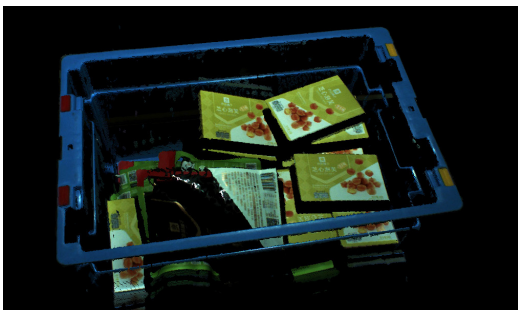
Leading food company

Customer Requirement

Vision-enhanced robots quickly pick items from mixed-SKU inventory bins and place them into order containers. The vision-enhanced robots should be able to handle thousands of SKUs per day.

The Mech-Mind Solution

- The Mech-Eye industrial 3D camera generates high-quality point clouds of a vast range of object shapes (**boxes, bags, bottles, etc.**) and materials (**plastic, paper**, **etc.**).
- **No previous registration of new SKUs**. Quickly adapts to changing packaging.
- **Multi-suction cup end effector** picks a wide range of SKUs with high accuracy, stability, and speed.
- Advanced AI algorithms calculate pickable items and optimal picking path, ensuring accurate picking and placing of the most challenging items (**e.g. objects that are close to the bin wall, stacked in corners, etc.**) without damage.
- Works with logistics systems such as **WMS, code scanner, and pick-to-light (PTL) system** to effectively execute sorting.



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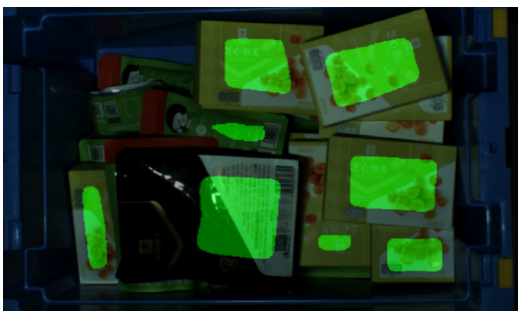


Recognition result

Results

- Sorting efficiency has been **doubled**.
- **24/7** stable operation.

Mech-Mind AI + 3D Vision Solutions

Vision-Guided Parcel Induction

Vision-guided robots quickly pick parcels (poly bags, boxes, envelopes, etc.) from the chute/conveyor belt and place them onto induction platform or stack them into trolley cages.

Capacities

- **Handle a variety of packages and parcels at high speed**

  Foam boxes, poly bags, jiffy packs, bubble mailers, envelopes, etc.

  Randomly piled or densely stacked.

  Handles out-of-spec parcels at high speed.

- **Handle parcels without previous registration**

  No pre-registration of new parcels, saving time while improving efficiency.

- **Accurate picking and reliable placing**

  Advanced AI algorithms support the robust 3D vision system to ensure effective picking and placing.

- **Easy integration**

  Works with crossbelt sorter and AGV to seamlessly integrate into existing infrastructure.

Recommended Cameras

- Mech-Eye LOG

Industries

- Distribution center

Point Clouds and Recognition Results

Randomly-piled express parcels

Case Study

Vision-Guided Parcel Induction

Large distribution center

Customer Requirement

Vision-guided robots can quickly pick varying parcels from a mixed batch and place them onto conveyor belts.

The Mech-Mind Solution

- The Mech-Eye industrial 3D camera generates high-quality point clouds of randomly-piled parcels (**boxes**, **pouches, envelopes, etc.**), ensuring accurate picking.
- **No previous registration of new SKUs.** Quickly adapts to new parcels.
- Works with six-sided barcode scanning to handle abnormal parcels (**damaged, deformed, etc.**).
- Works with **AGV and crossbelt sorter** for efficient induction.

Point cloud

Recognition result

Results

- Processing more than **tens of thousands of parcels** daily, dramatically improving distribution efficiency.
- The automated parcel induction process can stably operate without manual intervention, reducing fixed costs and providing higher productivity.

More Cases

Scan QR code
to watch videos

Vision-Guided
Case Depalletizing

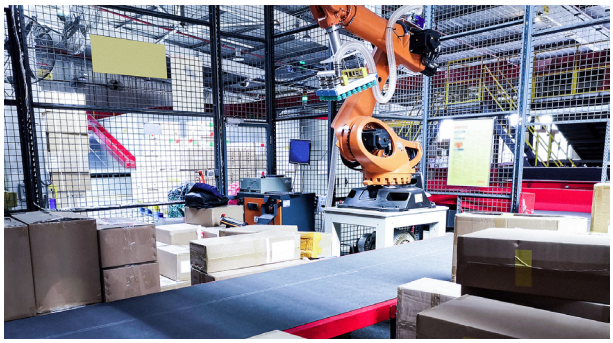
- Supports cases with **reflective tapes, cable ties, and patterns**
- Processing speed: **2000 pieces/hour** (multipick)
- **No previous registration** of new cases

Vision-Guided
Tote Palletizing and Depalletizing

- Supports pallets as tall as **2.3 m**
- Works with **unsealed, thin-walled, and tightly stacked totes**
- The single workstation can both palletize and depalletize totes

Vision-Guided
Sack Depalletizing

- Supports **sacks with deformation, wrinkles, and patterns**
- Works with bag-breaking machine
- Enables **24/7** production

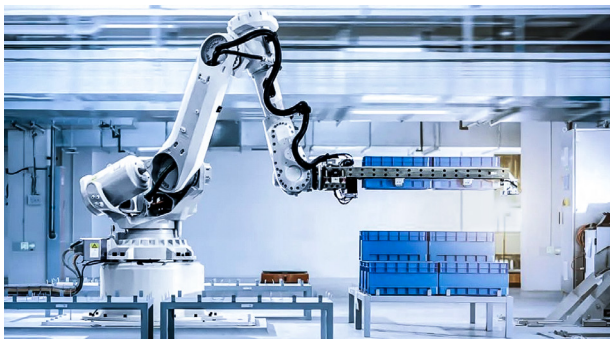


Vision-Guided
Mixed Case Depalletizing

- Depalletizes cases without pre-learning
- Depalletizes with optimal picking sequence
- **Path planning & collision detection algorithms** ensure collision-free operations
- Processing speed: **> 1000 pcs/h**

More Cases

Scan QR code
to watch videos



Vision-Guided Tote Depalletizing

- Supports **thin-walled totes with uneven surfaces**
- Installed on the robot arm, one camera can cover two workstations
- Obtains accurate positions of one layer of totes by one capture

Vision-Guided Case Palletizing and Depalletizing

- Quickly adapts to new cases **without pre-learning**
- Configurates the vacuum gripper to grab the maximum number of cases
- **Real-time object detection and verification** for accurate palletizing & depalletizing

Vision-Guided Depalletizing

- Supports hundreds of cases of mixed sizes and weights
- Supports **random pallet patterns**
- Supports **tightly-packed cases with patterns and cable ties**
- One camera covers several workstations, improving efficiency.

Vision-Guided Sack Depalletizing

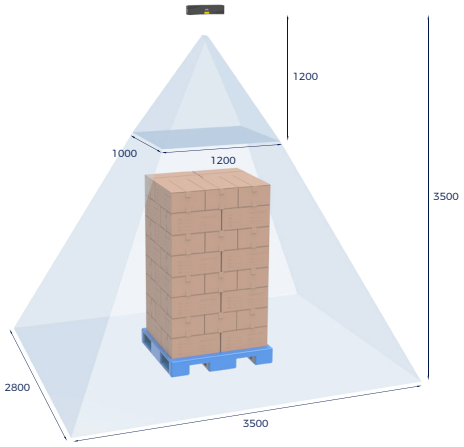
- Handles sacks stacked in irregular patterns
- Supports **sacks with wrinkles and deformation**
- One capture can cover an entire layer of sacks
- Works with the bag-breaking machine to improve efficiency

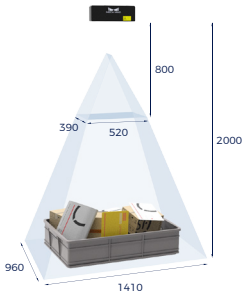
Mech-Eye Industrial 3D Cameras

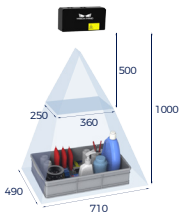
High-performance industrial 3D cameras for the most demanding automation applications

Specification	DEEP 	LOG M 	LOG S 
Recommended working distance	1200–3500 mm	800–2000 mm	500–1000 mm
Near FOV	1200 × 1000 mm @ 1.2 m	520 × 390 mm @ 0.8 m	360 × 250 mm @ 0.5 m
Far FOV	3500 × 2800 mm @ 3.5 m	1410 × 960 mm @ 2.0 m	710 × 490 mm @ 1.0 m
Resolution	Depth map: 2048 × 1536 RGB: 2000 × 1500	1280 × 1024	1280 × 1024
Megapixels	/	1.3 MP	1.3 MP
Point repeatability Z (σ)[1]	1.0 mm @ 3.0 m	0.3 mm @ 2.0 m	0.1 mm @ 1.0 m
VDI/VDE accuracy[2]	3.0 mm @ 3.0 m	0.3 mm @ 2.0 m	0.2 mm @ 1.0 m
Typical capture time	0.5–0.9 s	0.3–0.5 s	0.3–0.5 s
Baseline	Approx. 300 mm	Approx. 280 mm	Approx. 150 mm
Dimensions	Approx. 366 × 77 × 92 mm	Approx. 387 × 72 × 130 mm	Approx. 270 × 72 × 130 mm
Weight	Approx. 2.4 kg	Approx. 2.4 kg	Approx. 2.2 kg
Light source	Red laser (638 nm, Class 2)	White LED (RG2)	
Image sensor	Sony CMOS for high-end machine vision	Other high-performance CMOS for high-end machine vision	
Operating temperature	-10–45° C	0–45° C	
Communication interface	Gigabit ethernet		
Input	24V DC, 3.75 A		
Power supply	CE/FCC/VCCI/UKCA/KC/ISED/NRTL	CE/FCC/VCCI	
IP rating	IP65		
Cooling	Passive		

Mech-Eye DEEP | Mech-Eye LOG M | Mech-Eye LOG S







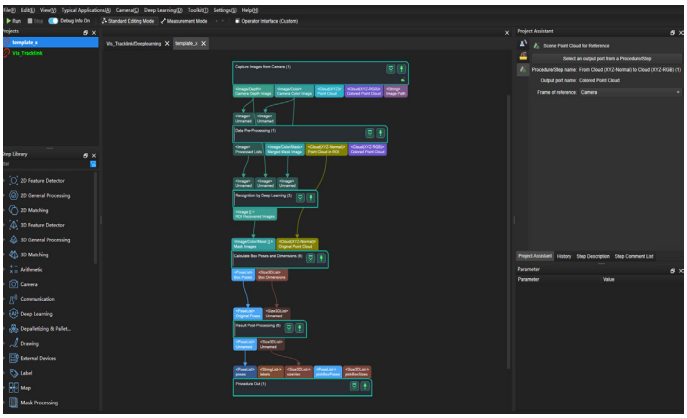
Field of view (mm)

[1] One standard deviation of 100 Z-value measurements of the same point. The measurement target was a ceramic plate.
[2] According to VDI/VDE 2634 Part II.

Mech-Vision

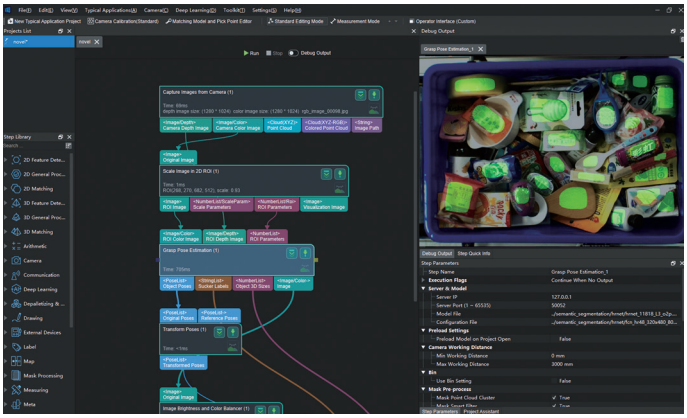
Machine Vision Software

Mech-Vision is an industry-leading machine vision software. It is designed to quickly build vision applications, whether simple or complex. With Mech-Vision, users can manage a wide range of vision tasks, including identification, localization, inspection & gauging, etc.



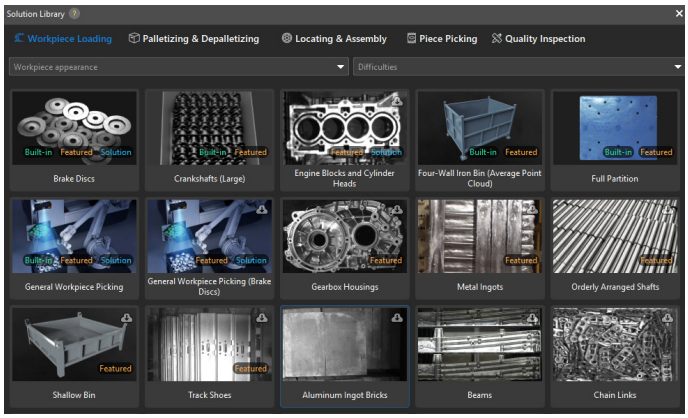
Build your vision applications efficiently

- Intuitive solution-oriented graphical user interface
- Drag-and-drop programming simplifies setup without writing a line of code
- Visualized parameter configuration and debugging



Manage complex vision applications with extensive tools

- Powerful algorithms: 2D/3D matching, deep learning, 2D/2.5D measurement, etc.
- Integrated machine vision tools: matching model, pick point editor, automatic calibration, caliper, etc.
- 3D Workpiece Recognition delivers recognition results in 1 sec, enabling easier and faster deployment of various loading and handling applications.



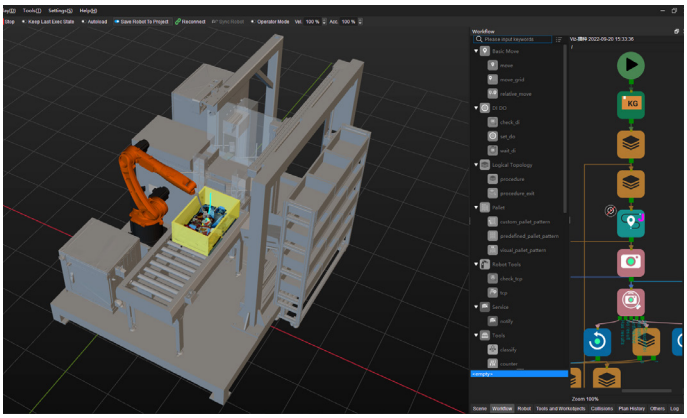
Develop vision applications easily and flexibly

- Robust Solution Library: get faster application deployment by adapting an existing project after simple modifications
- Support for embedded scripting, customization, and system integration
- Multiple languages: English, Japanese, Chinese, and Korean

Mech-Viz

Robot Programming Software

Mech-Viz is a software product for efficiently implementing robotic applications without writing a line of code. Mech-Viz enables robots to manage demanding automation tasks with excellent stability, extraordinary flexibility, and outstanding consistency.



Intuitive Robot Programming

- Intuitive graphical user interface
- Code-free programming environment
- One-click simulation of robot path

Powerful Algorithms for Reliable Robotic Operations

- Motion planning and collision detection
- Mixed palletizing & multi-pick depalletizing algorithms
- Picking strategies: multiple pick points, symmetry, etc.

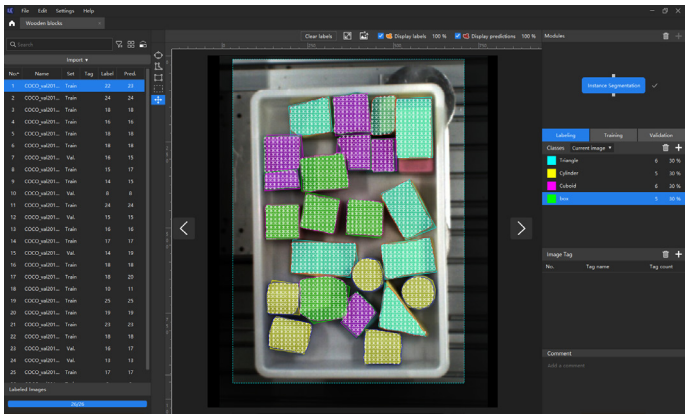
Flexible and Easy Implementation

- Support for almost all major-brand robots
- Provides robot path reporting and tracking to reduce debugging complexity and time significantly
- Multiple languages: English, Japanese, Chinese, and Korean

Mech-DLK

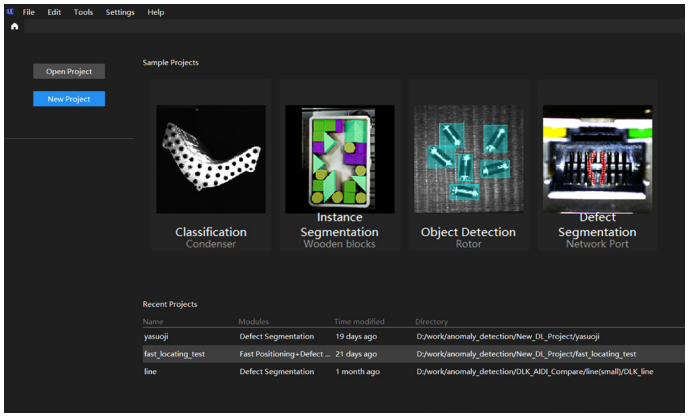
Deep Learning Software

Mech-DLK is a versatile deep learning software solving complex machine vision tasks. It enables users to rapidly train models and easily solve demanding vision applications, including overlapping object recognition and classification, complex defect detection, etc.



Train models efficiently without writing a line of code

- Intuitive code-free user interface
- Visualized model validation
- Advanced data augmentation: train models with smaller image sets
- **Finetune** function: leverage pre-trained models to expedite training, rather than train a model from scratch

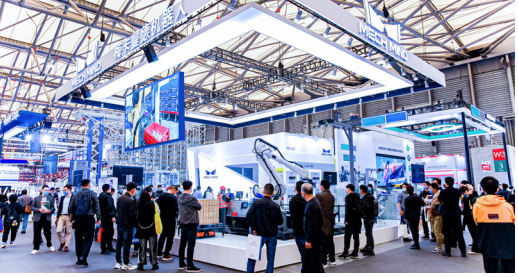


Manage complex machine vision tasks with speed and accuracy

- Manages complex vision applications with powerful algorithms such as fast positioning, defect segmentation, and instance segmentation
- Smart Labeling Tool and Template Tool simplify the labeling process, saving time and effort

Integrate your vision tasks into your production environment easily

- Multi-language SDKs: C, C++, C#, etc.
- Multiple languages: English, Japanese, Chinese, and Korean



About Mech-Mind

Mech-Mind is an industry-leading company focusing on industrial 3D sensors and software suite for intelligent robotics.

By combining 3D vision with AI technology, Mech-Mind brings automation to the next level and empowers partners and system integrators to manage the most challenging automation tasks, including bin picking, depalletizing & palletizing, picking & placing, and more.

One of the Highest-Funded AI + Robotics Companies

Founded in 2016, Mech-Mind has closed its Series C+ with total funding of **> USD 200 million**. Backed by top global investors including **Sequoia Capital and Intel**, Mech-Mind has been one of the highest-funded AI + robotics companies all over the world.

World-Class Team with Deep Technical Knowledge

Mech-Mind assembles a world-class team of **700+ amazing individuals**. Our global team with highly qualified experts provides deep technical knowledge in **3D sensing, vision and robotics algorithms, robotics software, and intelligent robotic solutions**.

Create Success Together with Partners and Integrators

Excellent usability, approved quality, high flexibility, comprehensive service, and competitive price, that's what we stand for and how we help our customers and partners to exceed in their business. Our mature solutions empower system integrators and partners to solve the most demanding applications and bring automation to the next level.

3000+ Applications Implemented for 1000+ Global Customers

Mech-Mind partnered with industry-leading enterprises and has deployed **3000+** applications in **50+** regions. By delivering cutting-edge technology and reliable solutions, Mech-Mind has created visible ROI for **1000+** global customers across diverse industries, including **automotive, construction machinery, logistics, home appliances, food and beverage, etc.**

3000+	1000+	700+	50+
applications	customers	employees	regions

Customers and Partners

Honeywell LOTTE DHL Continental Lenovo DEMATIC DAIKIN arçelik HIGHLY
GMCC Midea Haier GREE intel SIEMENS BOSCH TOYOTA TESLA
NISSAN BYD NIO GEELY ABB YASKAWA KUKA Kawasaki FANUC DENSO NACHI MITSUBISHI ELECTRIC
UNIVERSAL ROBOTS DOBOT FOXCONN SDS brose WEICHAI CAT SKF LiuGong XCMG ZOOMLION

Compatible with Major-Brand Robots

ABB KUKA YASKAWA FANUC Kawasaki NACHI DENSO UNIVERSAL ROBOTS STÄUBLI EFORT
MITSUBISHI ELECTRIC GREE ROKAE a-b TM ROBOT TURIN AUBO ROBOTICS DELTA QJAR QKM
DOOSAN EPSON HAN'S ROBOT ESTUN ROBOTICS HYUNDAI HEAVY INDUSTRIES CO.,LTD. COMAU JAKA SIASUN DOBOT ELITE ROBOTS fruitcore robotics

3D VISION & AI FOR ROBOTS AND MORE

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