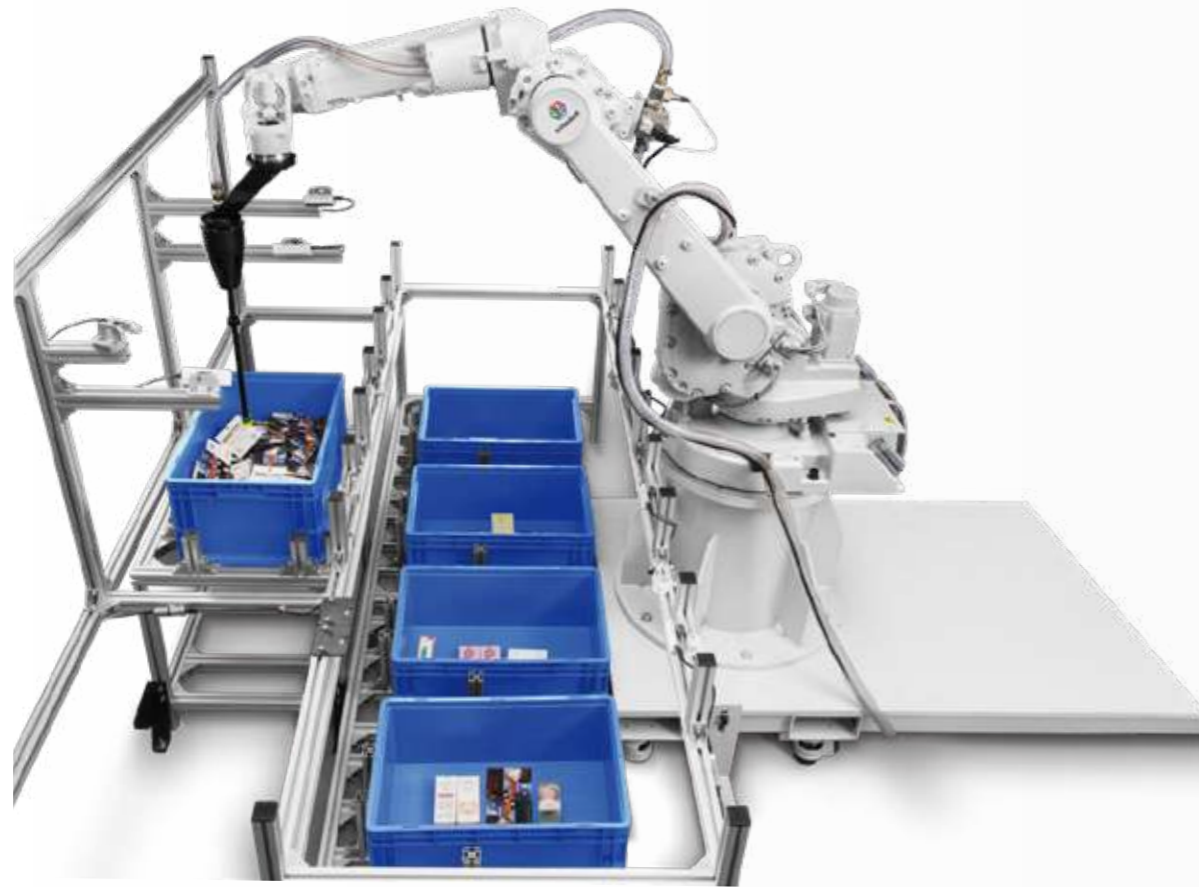


Piece Picking Robot



The piece picking robot picks a specified number of SKUs from storage totes and places them into order totes. It often cooperates closely with upstream goods-to-person systems, such as shuttles, miniload, AutoStore, AGVs, etc.

XYZ Robotics' piece picking robot features **comprehensive SKUs coverage**, **great efficiency**, and **high reliability**.



Adaptable

- **Model-free** recognition of **10,000+** SKUs
- **Fast tool change** for SKUs of different properties

Efficient

- The throughput is up to **1,800 pieces/hour** with fast recognition and teachless robot motion

Reliable

- Achieve **99.9% accuracy** and handle errors like missing, dropping, double-pick, etc.
- **Release SKUs from 2 cm above gently** to avoid damage
- Place SKUs orderly and tightly in the tote with a **high loading rate of 90%**

Specification

Layout	1 to 4 order totes	1 to 1 order tote
Throughput	900 pcs/h (< 350 g)	1800 pcs/h (< 350 g)
	700 pcs/h (350 g - 1500 g)	1000 pcs/h (350 g - 1500 g)
	400 pcs/h (1500 g - 3000 g)	600 pcs/h (1500 g - 3000 g)
Working Hours	24 h/d	
Order Accuracy	99.9%	
Tote Loading Rate	60-90%	

HMI

- Real-time Monitoring**

Display the SKUs information, order progress and onsite monitoring

- Tool Selection**

Select the best-fit tool

- Fast Troubleshooting**

Check saved error logs for troubleshooting



Layout



Upstream:
Shuttle



Upstream:
AGV



Downstream:
Put wall



Downstream:
Conveyor

Upstream System



Shuttles



AGVs



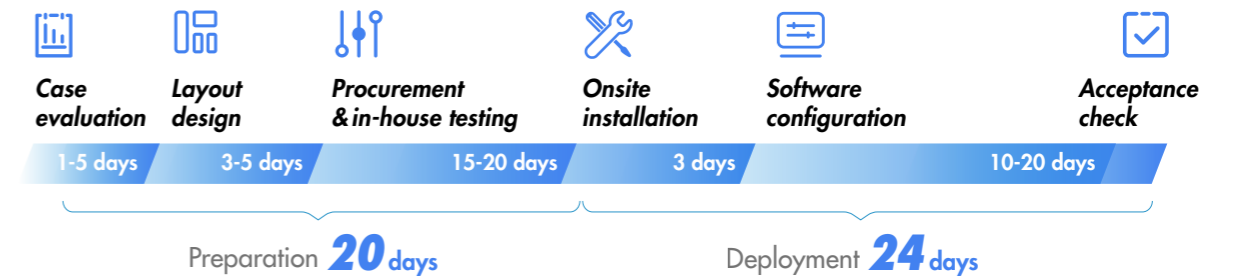
AutoStore



Miniload

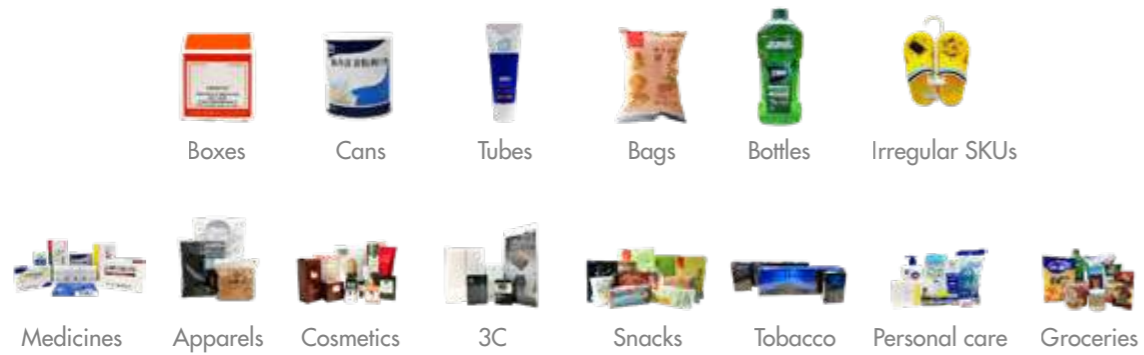
Lead Time

Business days



Handling Range

✓ Acceptable SKUs



⚠ SKUs Requiring Special Placement

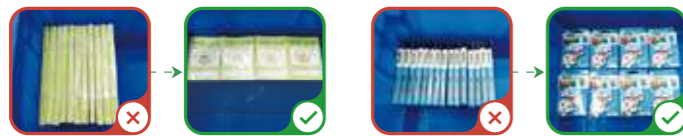
Tubes *need to lie down to increase picking efficiency



Bottles *need to lie down



Flat SKUs *large side up



Labeled SKUs *non-labelled side up



Handling Range

✗ Unacceptable SKUs

Glass or fragile SKUs



Loose packaging



Slim SKUs

*width < 0.5 inches/1.5 cm



SKUs without flat and sealed surfaces

*bath sponge



Loose packaging



Irregular shapes

*hair clip



Lid box without seal



Unpackaged book



1 Core Technology Vision System



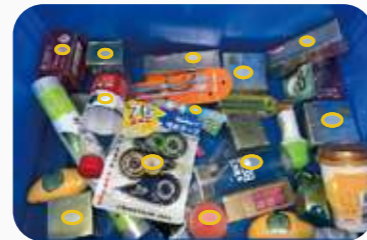
Camera



Vision Algorithm

- **Model-free**

Recognize massive SKUs with advanced deep learning algorithm



Mixed SKUs

- **High-speed**

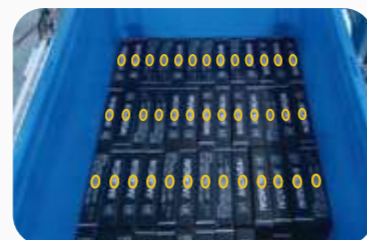
Scan the first SKU in only 1 s with no extra waiting time for the rest



Black SKUs with reflective packaging

- **Adaptable**

Capable of handling SKUs with dark, patterned, reflective, and semi-transparent surfaces



Densely packed SKUs

- **Reliable**

3D camera can recognize SKU pose for better placement and detect errors like double-pick

2 Core Technology End-of-Arm Tooling System



- **Weight Sensor**

- **Accurate Picking**

Detect possible errors like double-pick and dropping (detecting range: 30–3000 g)

- **< 0.1% Dropping Rate**

Dynamic robot speed adjustment according to the SKU weight

- **Tool**

- **Comprehensive SKUs Coverage**

Multiple tools designed for SKUs of various sizes, materials, and hardness

- **High-speed Tool Change**

Switch into the best-fit tool automatically in only 0.5 s



1

Case Study

SHOE BOX AND APPAREL BAG PICKING

E-commerce Industry

Overview

Guided by the vision, the robot picks shoe boxes or apparel bags and places them on a conveyor for downstream delivery.



Highlights

- Use custom grippers and a switching device to handle SKUs with diverse packagings
- A custom turnover device paired with vision ensures that the barcode sides of SKUs are upward for downstream scanning

2

Case Study

MEDICINE PICKING

Pharmaceutical Industry

Overview

The vision-guided robot picks and places a specified number of medicines in one of the six outbound totes. The medicine packages include different sizes of bottles, bags, and boxes in the form of individuals or sets. These different packages are visually confusing.



Highlights

- The vision distinguishes a set of densely-packed medicine boxes from single ones accurately
- Verified with the vision and the weight sensor, the robot handles with a high picking accuracy of > 99.9%
- 5 suction cups for numerous SKUs

3

Case Study

PHONE BOX PICKING

E-commerce Industry

Overview

The vision-guided robot picks mixed phone boxes and places them on the conveyor in a designated pose for downstream barcode scanning and automated packing.



Highlights

- The robot recognizes and picks disordered and mixed boxes accurately
- Guided by vision, the robot places large sides upwards for barcode scanning
- Handle massive orders 24/7 without errors during Chinese Black Friday

4

Case Study

CONSUMER GOODS PICKING

E-commerce Industry

Overview

The vision-guided robot picks a specified number of SKUs from totes and places them on the conveyor. SKUs are confirmed by barcode scanning.



Highlights

- The robot picks a specified number of SKUs from different totes and they are confirmed by barcode scanning
- Model-free recognition of massive fast-changing SKUs

5

Case Study

GROCERY PICKING

Retail Industry

Overview

After a specified number of groceries are collected in a tote, the robot picks and places them one by one onto the conveyor for downstream sorting.



Highlights:

- Model-free recognition of 2,000+ SKUs
- Use multiple grippers with fast tool change to fit diverse SKUs from mini chocolate bars to bread bags
- Enable manual adjustment of task priorities on HMI

6

Case Study

STATIONERY PICKING

Power Industry

Overview

After the tote with SKUs is transported to the robot by AGV, the vision-guided robot picks items according to the WCS order and places them in the grid container or on the conveyor leading to a downstream delivery robot.



Highlights

- Cover a wide range of SKUs, including glues, markers, folders, notebooks, power strips, etc.
- The vision detects errors, such as double-pick and missing pick, to ensure the picking accuracy
- Fully automated management and outbound paired with AGVs, a grid container, and a delivery robot

7

Case Study

CARRIER REEL PICKING

Electronics Industry

Overview

The delta robot picks certain SKUs one by one from different totes containing various SKUs, puts them on a barcode scanning platform for confirmation, and then places them into the order tote.



Highlights

- High efficiency of 1,000+ pieces/hour
- Ensure picking accuracy by scanning four barcodes on each SKU for quadruple check

More Customer Cases



Manufacturing



Machinery



Auto Supplier



Personal Care



E-commerce



Scientific Research