TECHNICAL SPECIFICATIONS

SIMATIC Robot Pick AI v1.1

SIMATIC Robot Pick AI is a deep learning-based software that provides pick points from camera inputs for arbitrary unknown items at runtime.

Features

- Web-based User Interface with views for operators or commissioning engineers
- Guided robot-camera calibration
- Bin pose detection (position + rotation)
- Bin collision avoidance
- Empty-bin detection
- Integrated into SIMATIC S7-1500 and TIA-Portal platform
- Integration with REST API
- Support of multiple camera vendors
- Compatible with any robot architecture (Anthropomorphic, SCARA, Delta-Picker, Cartesian, etc.)
- Bar code reading as supported option

Range of applications

- *Use Cases*: Goods-to-robot, warehouse or sorter induction, put-to-wall, batch picking, returns management, sortation, packaging, kitting, putaway, etc.
- *Industries:* logistic, pharmaceutical, food & beverage, retail, grocery, fashion, cosmetic, electronics
- *Supported SKU classes:* boxes, polybags, bottles, cans, tubes of arbitrary shapes, colors, textures and sizes with a minimum size of 30x30x19 mm (LxWxH)

AI Capabilities

- *AI technology:* Supervised Deep Learning for Pick Point Computation
- *Donor Bin Configurations:* Single object, chaotic heap, ordered heap, densely packed bin with one or more layers
- *Training:* No engineering and training for new items and deployments
- *Pick Point Output Format:* Pick pose (3D point and approach normal vector)
- *Computational time*:* End-to-end (image retrieval + inference) time in milliseconds

  Entry-Level Compute Platform
  1853ms

  High-Power Compute Platform
  470ms
- *Pick performance**

  First Pick Success
  99%

  Execution Success End-to-End
  98,8%

*Those numbers have been measured under normal operation condition and with the supported SKU classes, and they could change depending on the size of the box, lighting conditions and gripper size. See the hardware requirements to have more information about the test environment. The camera used for the showed data it is the Zivid 2 L100. Product will perform on arbitrary shapes and sizes without modification or retraining. However, performance may vary. For detailed information please refer to the „Hardware Installation and Operating Manual"

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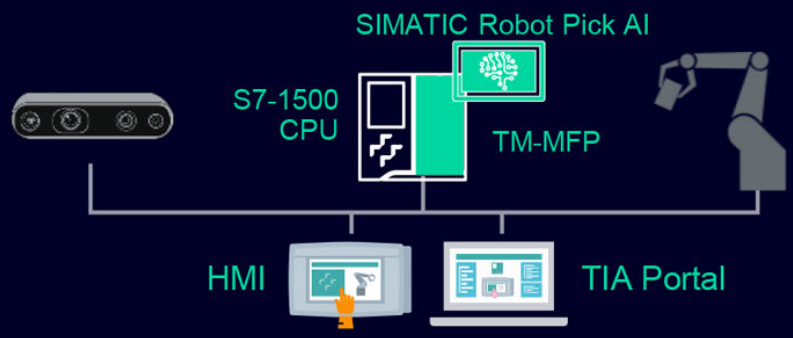

Hardware specifications

- Minimum hardware requirements:
  - 4-core processor (Intel Atom® 1.6 GHz)
  - 8GB RAM
  - 128GB SSD
- Host platforms:
  - Entry-Level: SIMATIC S7-1500 TM MFP
  - High-End: SIMATIC IPC BX39-A
- Robot: compatible with any robot
- Grippers: single-suction cup vacuum grippers with configurable suction cup diameter and configurable gripper length
- Donor Bins: straight wall containers, nontransparent, non-reflective with flat bin bottom
- Cameras: IDS Ensenso N35/36, Ensenso N45/46 paired with uEye+ and Zivid 2 L100. For development and test: Framos and Intel RealSense D415/ D435/D455/L515
- External lighting could be required depending on the camera

Sofware specifications

- Host platform:
  - Siemens Industrial OS v3
  - Debian 11
- Portable Dockerized software packaging
- Engineering tools for commissioning: TIA Portal
- TIA Function Blocks for integration with the PLC program are provided
- Communication protocols:
  - PLC backplane bus
  - HTTP

Case Study

The following application with SIMATIC Robot Pick AI has been tested with a 6-DOF articulated robot from Yaskawa, Ensenso N46 + uEye, Schmalz end-of-arm tool with controlled lighting conditions. The items have been picked from a full-size Eurobox (600x400x280mm) weighing 0.25kg and of size 100x50x150mm.

- Picks per hour: up to 1200pph
- Reliability: +97%
- Bin clearance: 100%
- Setup footprint: 2000x1000x2000mm

Support and documentation

Please refer to the manual for more details:
https://support.industry.siemens.com

Request a demo

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