KONICA MINOLTA

FORXAI

OBJECT
DETECTION
AND COUNTING

COUNTING AN THOUSANDS OF DIFFERENT OBJECTS FASTER, WITHOUT AN SINGLE MISTAKE?

In modern factories and production processes there is constant and unrelenting pressure to increasing manufacturing throughput. Along with a lot of tools and strategies used for speeding up production, your improved employee training may not satisfy your needs. The average production rate is not maintainable for humans any more or at least, it's more time consuming than before. Along with conventional methods of object recognition and counting, there are a few new methods, which can be used to count, recognize or classify an endless list of objects. Yes, plastics, metals, food and more. With or without structure, "glued" together, with different colours or maybe in the wrong direction than it's supposed to be. We found this as a recurring bottleneck for many production sites.

Konica Minolta offers FORXAI, an imaging IoT platform. The platform, combines imaging technology, which is Konica Minolta's strength, with cutting-edge IoT and AI technologies. An in-house developed solution, Object Detection and Counting (ODC), provides statistical data for produced items by time and their type (category), primarily for inventory or production purposes.

HOW DOES IT WORK?

FORXAI Object Detection and Counting application is a production line tracking solution aimed at streamlining the process of detecting, counting, and categorizing items on a production line. The items are displayed, tracked, and counted on a live dashboard that displays snapshots of the production line to operators, helping them keep track of statistical data. A scalable system allows us to use multiple cameras* and aggregate the results into a single statistics per customer configuration.

*Maximum up to 4 cameras per single configuration for aggregated result

YOUR DATA, DIRECTLY FROM OUR DASHBOARD

Detection snapshot
Displays the latest image of the production line

Total
The total number of items that passed through the production line regardless of type

Statistics
The number of production line items divided by their respective type

SYSTEM INTEGRATIONS

In parallel to the real-time dashboard for visualization of the detection results, the system can be configured to provide the generated data to another application via an integration interface or drive physical outputs based on the detection results (or user inputs). The range of supported integrations depends on the specific deployment and can also be a subject of custom development if required. Since the product implements a general support for HTTP requests (REST API calls), the below list is not complete and many more I/O modules can be integrated with the solution with REST API. The system has been tested with the following I/O modules:
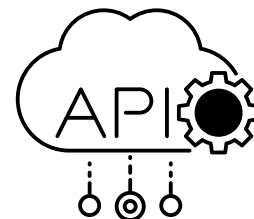
I/O BOX

MX - 232 - IO - BOX
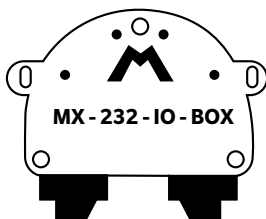
PLC
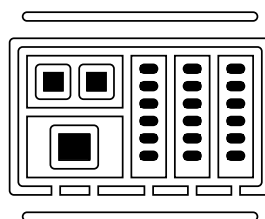
API

WHAT ARE YOUR BENEFITS?

Intuitive Graphic User Interface available for system administrator

Flexibility in adding new products by Machine Learning model retrain

More accurate production planning based on reports

Solution requires no supervision and can run 24/7

Production report by hour/day/week/month

Flexibility in extension in further use cases

Production report by product type

Count the number of products (separate number per each type) on one production line

Increased production efficiency

BAKERY

Baked goods have been around for thousands of years. Bakeries often sell to retailers such as supermarkets, convenience stores, delis as well as to large retails chains where production planning and quality assurance might be a competitive advantage over other producers. As others, the bakery market is also full of competitors. These facts forced the company to upgrade from a human hand made & decision driven bakery to semi-automated manufacturing, with data driven decision making. From the product point of view, bakeries are demanding production facilities offering different types of products such as breads, bread rolls, buns, bagels, loaf breads which differ in terms of size, weight, colour, structure, ingredients etc. Installation of MOBOTIX IoT camera with FORXAI Object Detection and Counting for one production line helped the company to improve production and delivery processes by correcting production planning, using reliable data from the system. The solution increased the overall efficiency as now, there's
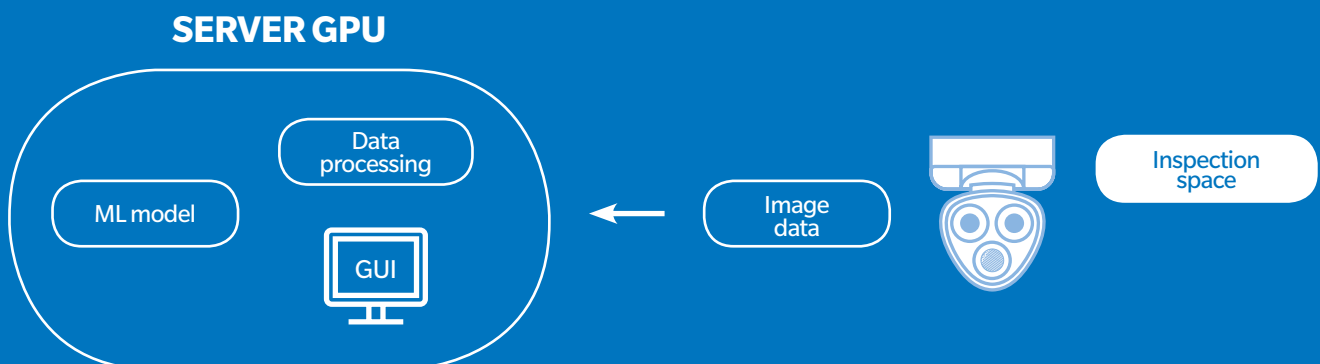

Example of different bread types

less need of human labour. The system also saves resources as it prevents production planners in making wrong decision based on manually gathered data. This usually leads to overproduction. The production line, where the solution is used, is now working better with rapidly increased accuracy and speed.

HOW DOES IT WORK?

The optical sensor, M73 camera, is mounted above the production line for high resolution and image quality. All to enable real time image acquisition. Algorithms trained on data provided by the investor, run on the dedicated on-site, high resource server with GPU and perform real time object detection, categorization and counting tasks. All results are displayed on the graphic system interface, from which line operator is taking real time data.

SERVER GPU

Data processing

ML model

GUI

Image data

Inspection space

System block diagram and camera assembly example

OBJECT DETECTION AND COUNTING PICTURES FROM PRODUCTION

Computer view
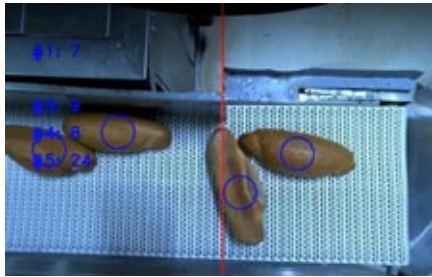
Different bread roll types

Dashboard

PRICING EXAMPLE

OBJECT DETECTION AND COUNTING	
Object Detection and Counting annual licences	
Camera and components	
Server GPU	
SW, Implementation, external system integration	
TOTAL COST + 1 YEAR LICENCES INCLUDED	**15.000 – 18.000 EUR**
BENEFITS EXPRESSIBLE IN NUMBERS	
Manual work costs cut	
Overproduction due to wrong/manual planning	
TOTAL SAVINGS PER 1 YEAR	**8.000 – 10.000 EUR**
BENEFITS NOT EXPRESSIBLE IN NUMBERS	
Increased accuracy (from 70% to 99% - Human vs AI)	
No mixed products in final packages – no claims	
Part of processes / solution compatible with client's automatization vision	

FOR MORE INFORMATION, PLEASE VISIT OUR WEBSITES OR CONTACT YOUR LOCAL KONICA MINOLTA SALES OUTLET.