M2M Vision

image recognition via neural network

M2M SOLUTIONS

Vision

2 ways of image recognition:

Detection of geometric shapes

- Necessary metric of all detected objects
- With any change of the detected object, it is necessary to include each change in the image evaluation templates and regulations

Detection using neural networks

- Flexible object recognition
- No restrictions on changes in lighting conditions
- Effective object recognition even with image degradation
- Object recognition without limitation of angle or image size

Vision

How does neural network image recognition works:

Quick train of the application to recognize the specific objects.

The camera footage is transformed online into the Vision application.

The application immediately marks the trained objects.

The possibility of expanding the conditions for evaluating the detected image:

- monitoring the presence of a specific object
- evaluation of the correctness of the storage
- counting the amount
- signaling (sound, light) and notifications

No demands on robust infrastructure and server capacity.

Vision

Possibilities of use:

- ✓ Object inspection
- ✓ Evaluating of collision situations
- ✓ Inventory of materials, goods, machines and equipment
- ✓ Site security management
- ✓ An open solution for additional tasks

Vision

Object inspection:

Control of the specific object and evaluation of the status of changes:

- e.g. tracking the position and evaluating the correctness of the material storage

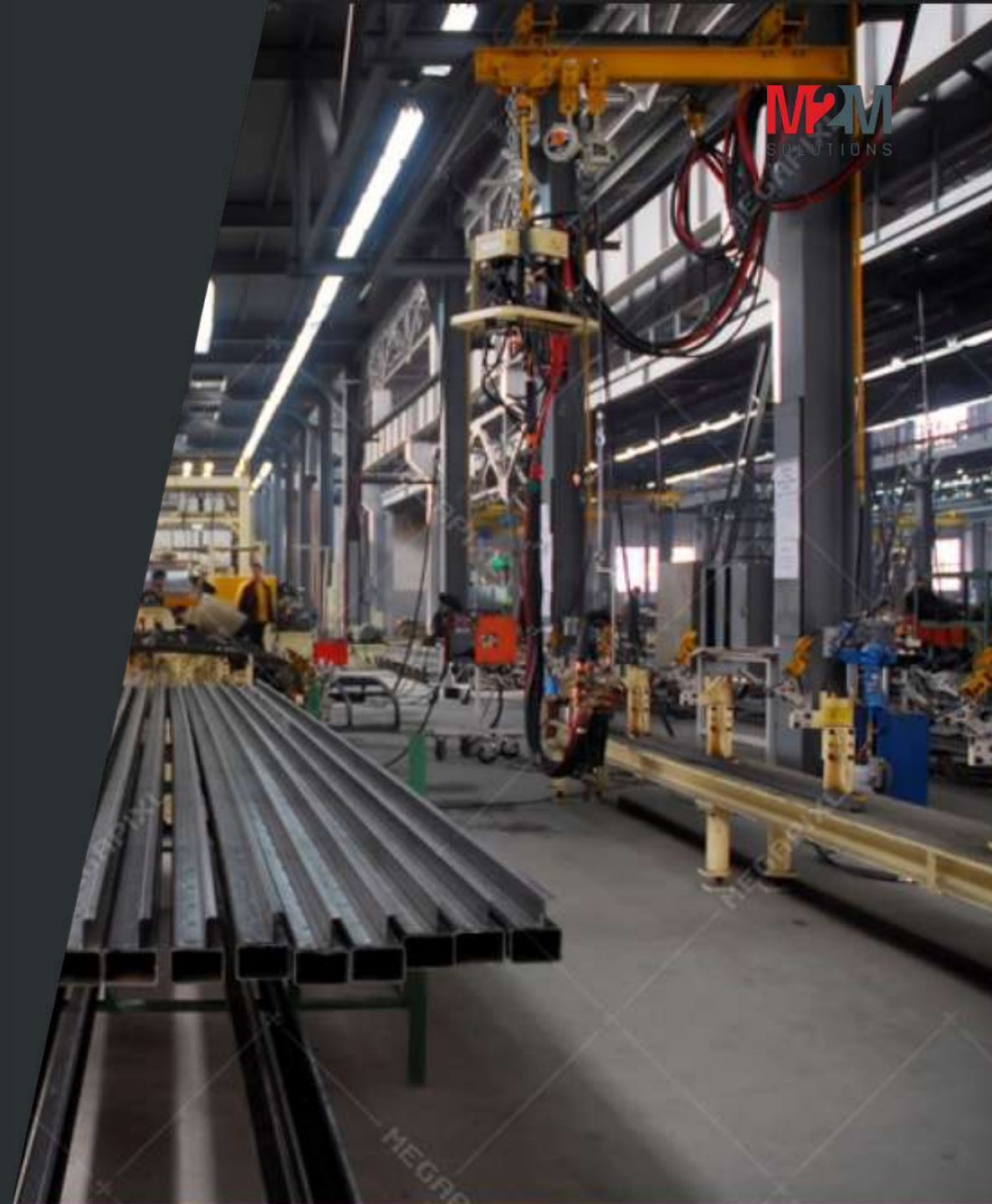
Quality control of final products and adjustment of evaluation deviation:

- e.g. evaluation of the quality of produced castings

Control of the occupation of the warehouse area or specific warehouse positions:

- e.g. quick overview of occupied and free warehouse positions

Support for evaluating Overall Equipment Effectiveness and Operators Resource System in the production process



Vision

Evaluation of collision situations:

Tracking the movement of objects

- e.g. movement of forklifs and people at the production hall or warehouse

Detecting multiple objects simultaneously

- e.g. a quick overview of the location of the forklifts at the area
- occupancy of specific job positions for operators resource system

Automatic evaluation of the threat of collision of specific objects

- e.g. defining the minimum distances between the forklift and a person
- incorrectly stored material in the warehouse position

The possibility of connection with different types of signaling

- e.g. light and sound signaling to prevent a collision

Vision

Inventory:

QR code or BAR code detection for:

- stock positions
- material and goods
- various transport units
- required machinery

Counting the amount of trained object

- online inventory
- tracking the filling of transport units (e.g. pallet, rack stacker, others)

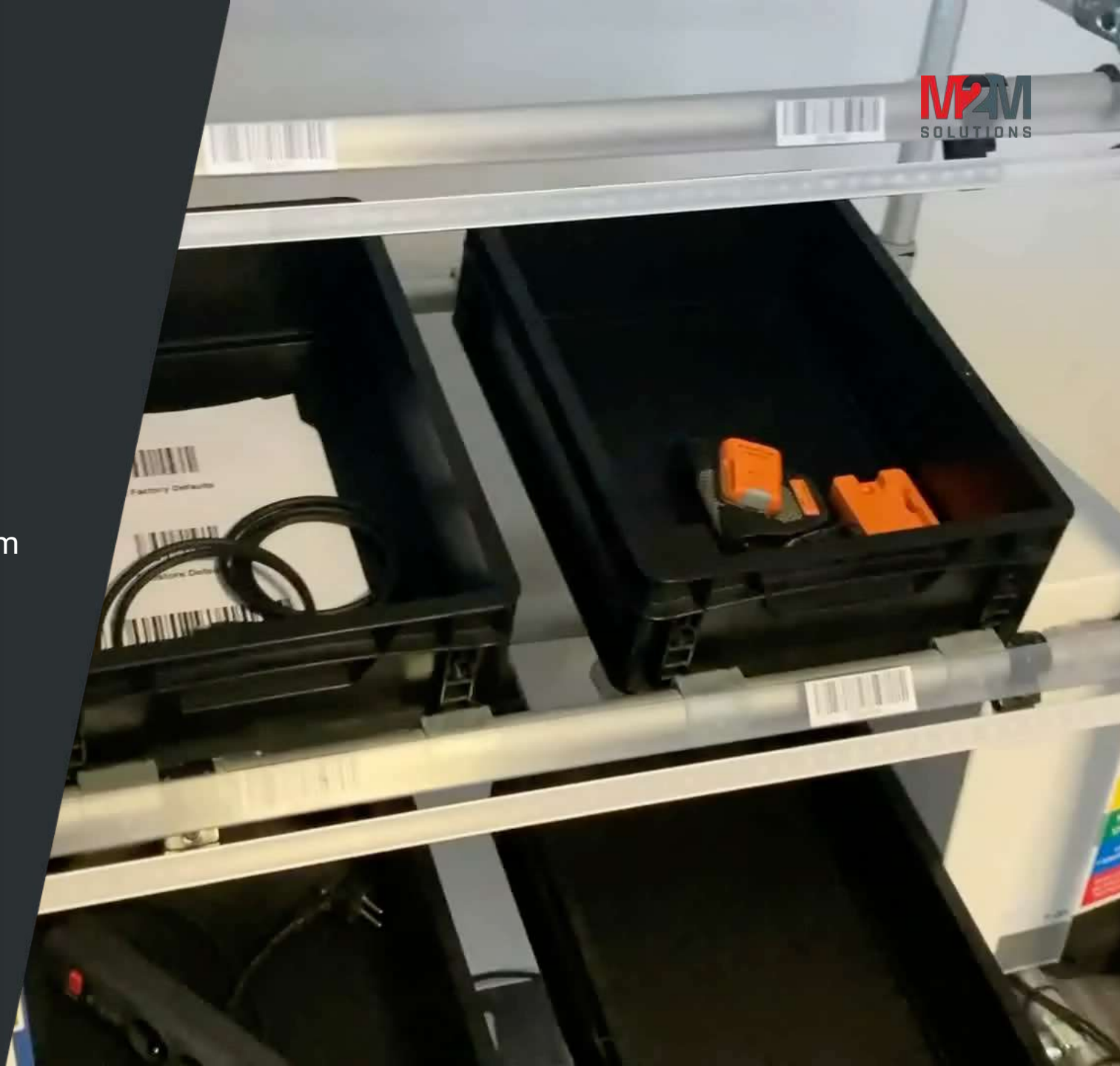
The possibility to set up a connection for the automatic summoning of forklifts for the transfer of transport units

Vision

Inventory:

Recording the selection of goods from the warehouse position:

- selection control at the conveyor
- suitable combination with pick to light system



Vision

Inventory:

Recording the selection of goods from the warehouse position:

- detection of multiple selections from stock positions
- accurate recognition of inserting/picking of material to and from the stock position
- a replacement for PDAs or other physical sensors

Vision

Site security management:

Site security management
Setting rules for authorized entry

- Combination with transport logistics system (vehicle license plate identification)
- Combination with the visitor management system (identification of employees and visitors)
- Possibility to use arrival/departure records for the attendance system

Monitoring the occupation of common areas

- Definition of the maximum number of people in a specific area

Vision

Site security management:

Setting rules for authorized entry

- Identification of the number or personification of crossings through exits without attendance turnstile, e.g. rest or smoking area

Evaluation of the use of protective equipment in the workplace

- e.g. helmet, protective glasses, respiratory protection, reflective vest, other...

Vision

Main advantages:

- ✓ **Ability to recognition of different objects** (material, products, goods, equipment, means of transport, people)
- ✓ **Quick training of the Vision system for required tasks** (from photos, from video footage)
- ✓ **The accuracy of the evaluation of objects even with demanding space conditions** (dust, moisture, partial visibility of the trained object...)

- ✓ **Without demands for building complicated infrastructure**

possibility to use existing cameras
without burdening the server capacity

- ✓ **Cheaper solution than other conventional solutions**
- ✓ **The possibility to use the Vision system for several required tasks**
- ✓ **Possibility to flexibly expand with additional tasks**

Vision

Application of the Vision system with autonomous robots and drones

For autonomous robots and drones

- Autonomous space mapping
- Route planning
- Avoiding danger and obstacles on the route in real time
- Monocular view
- Inventory and health check

Do not waste your resources, we will show you, how to save.

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