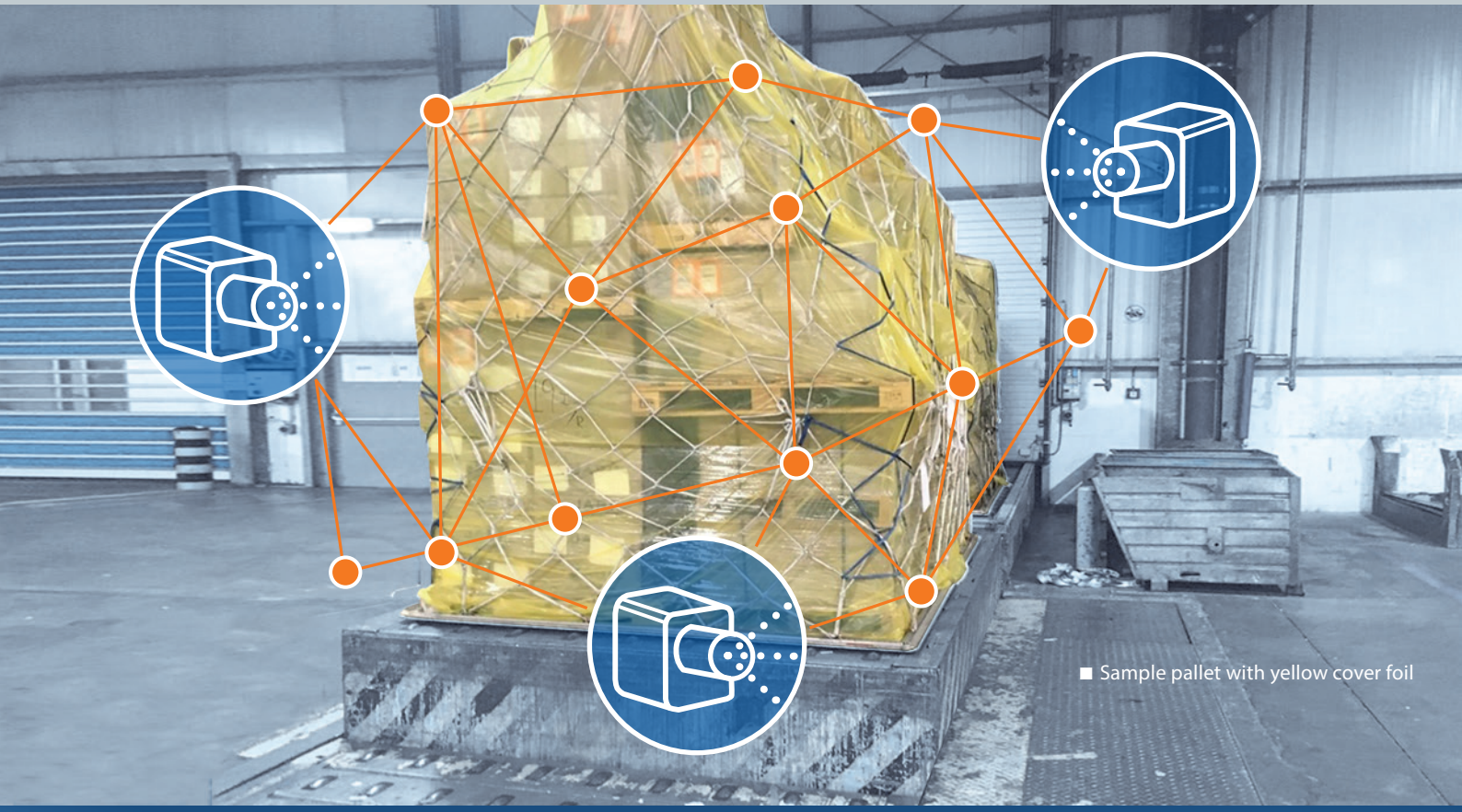
JOBREPORT 35



■ Sample pallet with yellow cover foil

www.koehl-mb.eu

FEATURES

- Easy handling
- 60 m spherical scanning volume
- Even large components require only a few sensors
- Automatic position detection for the first time also for small & complex components
- Reliable individual package identification
- ROS interface for manufacturer-independent application

Measure packaging cargo pallets innovatively

With digital Freight Scan - cost efficient & precise

Efficiently packing cargo pallets is a demanding and very error-prone process, which regularly leads to flight delays or clarification cases due to packing errors. The aim of the Industry 4.0 cooperation project between ESPACE 2001 S.A., Köhl Maschinenbau AG, 3D.aero and Luxair SA was to develop a completely new measuring system for determining the three-dimensional shape of a pallet.

The pallet must have a special packing scheme so that the cargo can be loaded into an aircraft. There are about 20-30 different packing schemes. The different schemes are determined by the airlines. Cargo companies must adhere to the specified geometric dimensions to ensure that the pallets can be brought into an aircraft without any problems.

3D.aero

KÖHL
SOLUTIONS WITH POWER

THE TASK

The packing scheme is given to the employees for each pallet. The three-dimensional shape of the finished packed pallet is then checked by employees using mechanical gauges. These procedures are very error prone.
The consortium wants to solve this task automatically by developing an optical 3D scanner. The TOF/PRT technology of P+F GmbH is used for this purpose. ESPACE2001 S.A. is development partner of the P+F Group and leads the developments described below for the P+F Group worldwide.

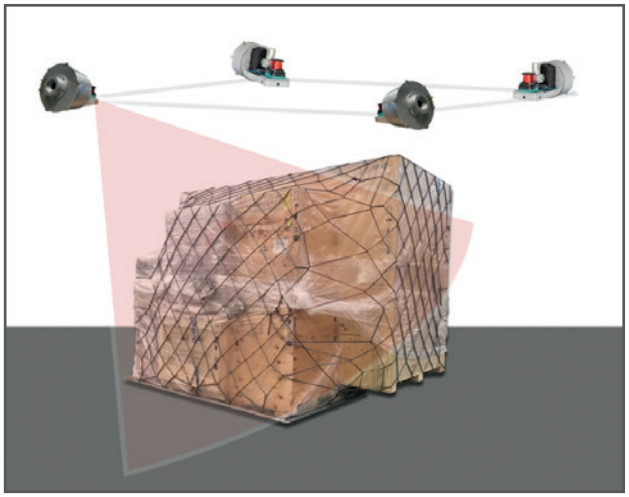
As a rule, it is not sufficient to scan the 3D shape using a known TOF/PRT. The 3D shape is also formed by protruding foil parts. These protrusions do not interfere with the insertion of the cargo into the aircraft.

Using a simple 3D scanning technology, these protrusions would be detected and treated as geometric errors. This would reject a large number of pallets. This is not a sensible technical solution.

THE SOLUTION

By using the PXL+ technology (3D pixel cloud + color information) this disadvantage of a simple 3D pixel cloud can be overcome. If a „deep learning network" is trained with this additional PXL+ information, it is possible to distinguish between a wrong geometry and a film overhang, thus preventing misinterpretation or falsification of the measurement result.

Using a new scanning technology PXL+ and the application of AI, a completely new dimensional measurement system for cargo pallets will be developed.



■ Measuring arrangement with 4 PXL+ scanners which are mounted stationary.

3D.aero SENSOR SOLUTION

3D.SwivelScan equips digital Freight Scan with the tool for precise digitization of cargo pallets, as well as accurate measurements and calculations within the 3D data. Their 360° measurement volume sensor provides the precise PXL+ data needed for a reliable identification of individual packages on the pallets to allow for optimal stacking.

In this application environment, a robust sensor with low susceptibility, a large measurement volume and an easy operating system are required to ensure the highest process security and reliability.
Together with 3D.aero we achieved the digital Freight Scan system fulfilling all the application requirements.

SENSOR - FEATURES

- Precise digitalization of cargo pallets
- Accurate measurements & calculations
- PXL+ data for reliable identification of packages
- Low susceptibility & large measurement volume
- Optimal stacking
- Easy operating system
- Highest process of security & reliability

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