

DANA Group

Case study: Vision system for robotized cell

“ABB was the company that best helped us to find the answers we were looking for,” says Mario Ferrazzuolo, Manufacturing Engineer at Spicer Ejes Pesados within DANA Group.



Dana is a multinational corporation present in 30 countries. It is devoted to the design, engineering and manufacturing of value added products and systems for the automotive market segment. In Argentina, the Spicer Ejes Pesados division, involved in the manufacturing of axles for trucks, features a manufacturing plant with about 300 employees and exports more than 90% of its production.

On the middle of the 1990s', the company started in Argentina a re-conversion in order to increase its efficiency. During this process, in which the company replaced its production lines with cells, the company started analyzing the machines to identify inefficiency points and bottlenecks. After a thorough study, the company found that the conflict started on the so called “subsequent operations” (washing, deburring, antirust protection and packaging), which are handmade.

The Solution

The original solution was a cell of subsequent operations. This meant to separate the deburring, washing and packaging from the different product cells and create a new cell exclusively dedicated to these operations.

A robotized cell was created for that purpose, capable of carrying out the entire process on a totally automated manner. It is possible to manipulate parts weighting between 45 and 62 kilograms with high-precision, sand the edges thereof and wash them in just a few minutes. The cell is based on an IRB 6400R robot with a load-bearing capacity of 200 kilograms and it also features a partmanipulating gripper, a vision system for robot-guiding, edgessanding tools, conveyors and part washer.

Implementation required a great local development effort to solve specific needs, which ended with results beyond Dana's original expectations, as Ferrazzuolo said. We tried to bring the system the highest flexibility and ease-of-use possible.

For example the vision system. Upon definition, it is responsive to light variations, contrast or shadows, among other elements, which have a great impact on the identification and measurement of parts.

In the case of Dana, particularly, it is necessary to capture images of different space points in an environment in which no one of the above mentioned elements remains constant. This circumstance, with the vision system operating as it originally did, motivated permanent system defaults, which implied a cell stoppage for the operator to accommodate the part manually, with the loss of time this implied.

Thanks to ABB's development, a localization system was implemented on the display. In this way the operator is able to get the vision system to place and adjust the part from a panel only by moving the cursor, without the need to enter the cell and do it manually.

Another special development challenge for the vision system is the way of viewing images. Due to the location of the camera and the image size required to identify the part, we employed a shortfocal-distance lens. As a consequence thereof, there is considerable image distortion, creating the need of a function to grade the image turning it into an image similar to the one captured by a camera with a long-focal-distance lens.

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Why a solution of ABB Argentina?

We looked for alternatives in the market to mechanize these subsequent operations and, among the seven suppliers who submitted offers, ABB's offer prevailed. "ABB was the company that best helped us to find the answer we were looking for," explains Ferrazzuolo. "From the first moment we had the feeling ABB's proposal was the most favorable alternative," adds Jorge Bruschini.

Other two points were key points in Dana's selection of ABB. On the one hand, ABB is present in Argentina. "We not only needed the solution, we also needed such solution to be sustained along time," says Ferrazzuolo.

The other key point was the kind of relationship. "We already had experience in the acquisition of integrated products and we have also purchased services such as this from third parties; we wanted to try another system, one in which we would not have limit our needs to the items appearing on a purchase order," explains the Manufacturing Engineer. We then set forth a partnership model between the two companies, upon which Dana's personnel worked together with ABB's staff to find the best solution. "We worked on a different framework. This was not a typical turnkey project. Diego Costa, from ABB Argentina highlights this aspect.

Benefits

- Higher efficiency on subsequent operations
- Great flexibility to treat different part types
- The solution is a local development and has local support
- The automated development of subsequent operations increases part quality.

ABB Robotics

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