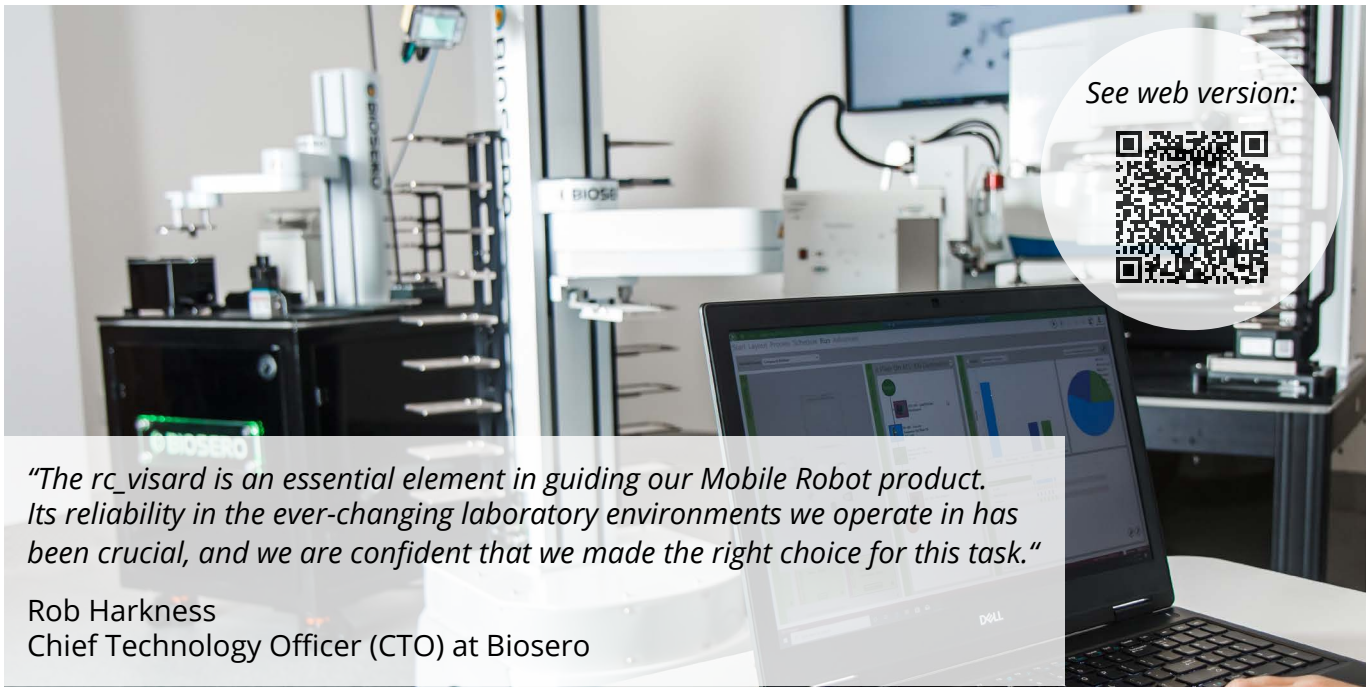
roboception

Precise Localization Ensures Robust Lab Automation Operations

Mobile robot relies on rc_visard for pick-and-place in lab automation



"The rc_visard is an essential element in guiding our Mobile Robot product. Its reliability in the ever-changing laboratory environments we operate in has been crucial, and we are confident that we made the right choice for this task."

Rob Harkness
Chief Technology Officer (CTO) at Biosero

When it comes to automating processes in laboratories, the potential is significant, but the challenges are many. Robotic systems must be able to handle delicate goods, work in the absence of humans as well as alongside them, and be flexible enough to adapt to regularly changing environments and tasks. Therefore, the ability to perceive the environment and precise localization are key in such sensitive environments. At the same time, reliability and robustness are absolutely essential in order not to jeopardize the often sophisticated processes.

Founded in 2003, laboratory automation specialist Biosero's first project was to help a pharmaceutical company automate its laboratory. Since then, Biosero's teams have been working to support scientists with "automation that works", with accessibility and robustness as the cornerstones of their solutions.

Developing a New Mobile Robot to Transport Delicate Labware

While developing a mobile robotic solution for moving labware between workstations and instruments within laboratories, the team encountered a challenge: The 5 cm position repeatability of their mobile base appeared to be sufficient for navigating the robot through the lab environment.

However, it was simply not precise enough to support the pick-and-place operations of highly sensitive labware. For this, they needed a much more precise localization, with an accuracy of 1 mm (!).

Precise Localization of Robot Arm and Tag Detection by Mounted Sensor

"We therefore needed a way to localize the arm with respect to the pick-and-place position. After extensive research, we decided upon using a method of pairing a fiducial with the pick-and-place position, as this is fast and non-invasive," explains Rob Harkness, CTO at Biosero. After evaluating a number of different camera solutions that provide out-of-the-box solutions for hand-eye-calibration and the detection of fiducials,

QR Tags, or AprilTags, the team decided to use Roboception's rc_visard and the supporting TagDetect software module.

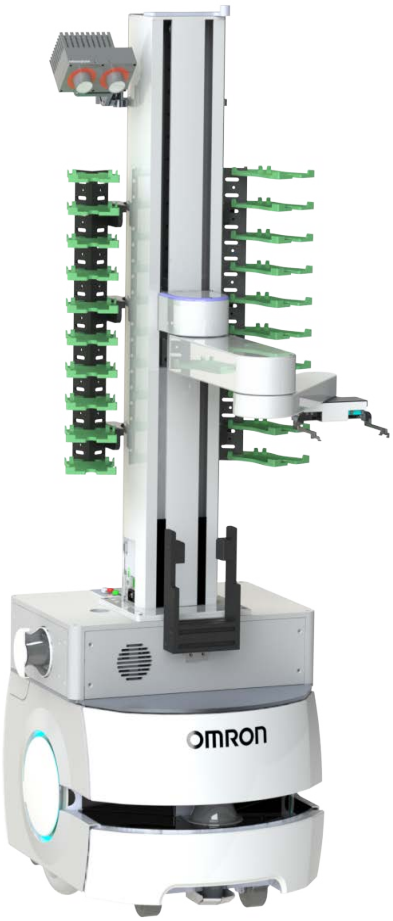
One decisive factor: The rc_visard 65 delivers a highly precise localization even at a 100 cm working distance, where it achieves a pose precision of 0.7 mm. This turned out to be critical, as the sensor must be mounted quite high on the Brooks PF-400 SCARA arm. This way, it would not obstruct the arm's path into the laboratory infrastructure that it is picking and placing from.

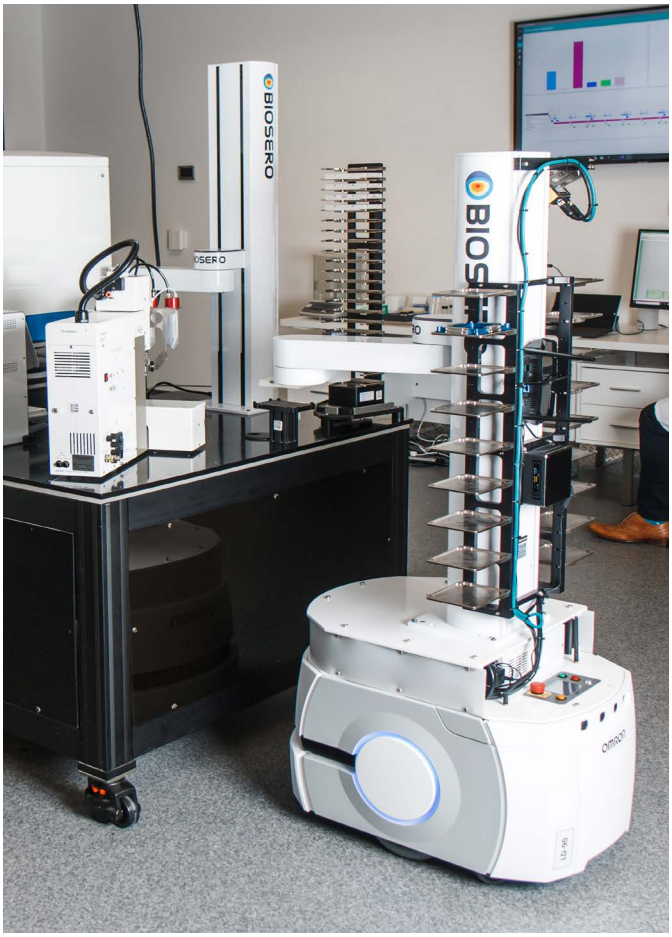
„Fantastic" Documentation and a Highly Responsive Support Team

In addition to the sensor's meeting their precise localization requirements, Biosero's teams appreciate that "the documentation from Roboception is fantastic and we have always found the support team to be very responsive". They believe that "Roboception's products will continue to be valuable in our future endeavors, as they allow us to develop innovative and efficient lab automation solutions for a wide range of applications".

About Biosero,Inc.

Biosero is a leading provider of lab automation solutions, specializing in the development and implementation of cutting-edge technology to optimize laboratory workflows. The company's innovative solutions are designed to increase throughput and minimize human error in various laboratory environments.





Roboception GmbH

'Eyes and Brains for Your Robot': Roboception is a leading provider of intelligent robot vision platforms and systems. The Munich-based company enables robots to see and think, thus providing key elements for flexible automation solutions in Industry 4.0.

Roboception supports integrators and end users in creating innovative automation solutions for the future-oriented use of robots in production and logistics.

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