INBOLT

Why are positioning technologies key for the digitalisation of manual assembly operations?

Indoor positioning systems (IPS) have become a staple of the industry digital transformation. Indeed, the IPS market has been experiencing a sustained growth for the past years and continues to do so. However, new technologies have appeared, increasing the number of potential applications and benefits of IPS. From ultrasound or ultra-wide band to 3D vision-based technologies, the accuracy and precision of such systems has improved dramatically. While most industrial applications of IPS consist in asset tracking or AGV navigation, a recent trend has seen the adoption of positioning technology for a new use case : **the creation of digital twins of manual manufacturing operations.**

Indoor positioning systems generally use technologies which identify the position of a tag / receptor thanks to triangulation methods. These technologies are numerous each with its own complexity, advantages and disadvantages : ultrasound, ultra-wideband, bluetooth, Wi-Fi, etc. However, in recent years, vision (2D & 3D) has emerged as a key technology for indoor positioning & navigation.

With the global shift toward an "Industry 4.0", new priorities have emerged such as improving the reliability and traceability of manufacturing operations. **However, automation is not the answer for all operations or all industries.** In many cases, assembly operations such as torquing, drilling, welding, riveting, etc. are complex and unique, requiring thus the expertise of an operator.

The question becomes now how to improve the reliability and traceability of manual operations? Indeed, operators can make mistakes and unlike machines, there is no real-time digital monitoring of each task they complete.

An IPS answers these challenges. Having access to the real-time location data of a hand-held tool when used by an operator makes it possible to :
- digitally recreate the trajectory of the tool : digital twin
- identify when a task is not properly completed : wrong drilling position, oversight of a bolt, wrong riveting sequences, etc.
- log all the information about the tasks completed : the exact position of a hole drilled or a bolt torqued for instance

This is possible by installing either a tag, tracker, transceiver or camera on the tool to track - depending on the technology behind the IPS.

Monitoring how tools are used is becoming increasingly widespread throughout industries especially for critical assembly operations. Whether it is in aerospace, oil & gas, nuclear or rail manufacturing, manual operations remain at the center of most assembly processes.

For instance, guaranteeing the sealing of a flange is a cross-industry concern of manufacturers.

But more importantly, using an IPS to guide and monitor in real time manual assembly operations, finally makes it possible for operators to be guarantors of the quality of their tasks. Thanks to real-time guidance, operators avoid non-quality and the need for time-consuming quality controls is reduced.

People are at the heart of the industry. In Industry 4.0, it is key to empower them. One way of doing so is by making tools smarter.

Interested in knowing more about which positioning system is the best for you or how to implement them? Reach out to us for more information!

About Inbolt

Inbolt develops a micro-location & guidance solution based on cutting-edge 3D computer vision algorithms for all industrial production means (robotic arms, hand-held tools and AMRs). The end goal is to improve the reliability and traceability of manufacturing processes in the industry thanks to real-time location data from the factory floor and appropriate guidance.

The solution takes the form of a small module to attach to the tool, robotic arm, AGV to track. The module will identify the position of the object it is attached to by recognizing its surroundings in 3D in real-time and with millimeter accuracy. With several patents and some of the biggest french manufacturers as clients, Inbolt is becoming a reference in 3D-vision based positioning systems.