

Collaborative robots in the footwear industry

by TUIASI



The manufacturing process in the footwear industry has always been a highly manual endeavor. Due to the complex geometry of the last, automation processes in the field have been slow to develop and costly to implement. In the past years however collaborative robots also known as cobots have received unprecedented attention as part of the Industry 4.0 technology revolution and they have become a common sight on the plant floor.

Collaborative robot technology is successfully integrated into the footwear industry and with significant productivity benefits in the manufacturing process. For example, footwear company Nike has been employing around 1,000 cobots in its distribution centers to help employees sort, pack, and change products, thus reducing shipping times [1].

Collaborative robots are designed to complete tasks side by side with their human counterparts in a shared work environment. [2]. The cobots are placed in the work-designated area assisting the other workers in performing menial, repetitive tasks that have an increased level of difficulty and cannot be fully automated. For example, gluing and sealing are the types of tasks suited to a cobot on the production line for footwear. A sealant or glue syringe is mounted on the end of the cobot and as the automated arm moves along the indicated path it distributes the sealant evenly [3].

Another top feature of collaborative robots is their specific intuitive design. The smooth edges, reduced motive power, and the high number of sensors that can assimilate the surrounding information make these machines a reliable work partners aimed to offer ease of mind and reduce the risks of injury [1], [4]. Thanks to these characteristics they can be successfully used for tasks such as picking and placing, sanding, polishing or deburring surfaces polishing, de-moulding, visual inspection, and palletizing [5].

Adding to the benefits of cobots in the industry is that they can be easily programmed directly by the workers, even without any prior knowledge of robot programming and automation. There are automation options where the robot is shown practically how to perform a task by moving the

robot arm to the correct places. This flexibility and ease of programming makes the cobots adaptable tools in many industries and especially in the footwear field.

Innovation in the footwear industry has also led to experimental collaborative robots being programmed to perform specific tasks to help showcase their capabilities. Such is the case of Maxwell Ashford, a design student at ECAL university of art and design from Renens in Switzerland, where he used a single-arm ABB YuMi cobot as part of his sustainability and recycling project called “Robotically Recyclable Concept Shoe”. His vision was to demonstrate that products can be designed with recycling in mind from the start and thus minimizing the environmental impact of waste materials. [6].

From practical uses to investigational procedures, the cobots have become indispensable collaborators in the footwear industry and can be considered somewhat extensions of human beings designed to solve problems, increase productivity and reduce production costs.

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