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Automatic Product Identification Based on Deep-Learning Theory in an Assembly Line

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Abstract : Automated object recognition and identification systems are widely used throughout the world, particularly in assembly lines, where they perform quality control and automatic part selection tasks. This article presents the design and implementation of an object recognition system in an assembly line. The proposed shapes-color recognition system is based on deep learning theory in a specially designed convolutional network architecture. The used methodology involve stages such as: image capturing, color filtering, location of object mass centers, horizontal and vertical object boundaries, and object clipping. Once the objects are cut out, they are sent to a convolutional neural network, which automatically identifies the type of figure. The identification system works in real-time. The implementation was done on a Raspberry Pi 3 system and on a Jetson-Nano device. The proposal is used in an assembly course of bachelor’s degree in industrial engineering. The results presented include studying the efficiency of the recognition and processing time.

Keywords : deep-learning, image classification, image identification, industrial engineering.
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