Optical recognition of alphanumeric codes on ceramic bowls used in lost-wax casting

Tiago Roque, Válter Costa, João Manuel R.S. Tavares
Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial, Faculdade de Engenharia, Universidade do Porto, PORTUGAL

Abstract
The industry is currently going through a new industrial revolution know as Industry 4.0, that consists in an exponential increase in automation and information exchange among different production phases with the goal of building "smart factories", where it is possible to have full control and feedback on all production stages. Hence, this work consisted on the development of a new computer system that fits within this philosophy; specifically, a system based on computer vision to recognize alphanumeric codes engraved along the edge of ceramic bowls commonly used in lost-wax casting.

Because it is mainly an Optical Character Recognition problem (henceforth OCR), the first step was to enhance the input image using several image pre-processing techniques; then, the text region was detected and the alphanumeric code segmented and finally, recognized using a well-known OCR engine. The developed computational solution was implemented and optimized in a Raspberry Pi based system with a Pi camera.

The experimental tests, conducted under different acquisition conditions, were very promising, leading to high accuracy rates and low processing times.

References


