

Machine vision for hot surface automatic inspection

September 15 2009

TECNALIA Technological Corporation is developing an innovative application for the automatic inspection of hot steel surfaces, based on Machine Vision technologies that enhance quality control in hot rolling mill processes.

The Infotech Unit at TECNALIA have received various queries from different parts of the world (England, Iran, amongst others) about the HoTubEye project. This is a surface inspection of hot steel project developed for the Tubos Reunidos S.A. company which has sparked great interest since the publication of an article in the international MPT journal and a presentation at the international ISIS08 congress.

One query came from Sumitomo Metals in Japan, the second largest steel-maker in the country. They expressed interest in the technology developed at Infotech and that enables surface defect detection and classification in steel at high temperatures (more than 1,100°C) by using machine vision.

Special laser illumination is used to this end in such a way that an image of the surface can be taken as if it were in a cold state. The system for image acquisition involves a gateway with capacity for the rapid assembly and dismantling for maintenance purposes. It is installed at the finishing train end of the rolling mill itself, a particularly difficult point due to dirty conditions and high temperatures. The system is capable of the real-time inspection of the entire surface of the steel tubes in order to detect defects, classifying them and monitoring their position.

Protection from heat and dirt is critical in this application.

The system employs a redundant system of special long-wave illumination distant enough from the emissions from red-hot steel, as well as optical filters, safety systems and three high-resolution lineal cameras incorporated into three protective cases - in order to inspect the surfaces, obtaining thus an image of the total process of the tube and as if it were at ambient temperature.

In order to process and manage the data, the Infotech Unit at TECNALIA have developed a made-to-measure application that takes picture, processes them, manages them on a database, manages the alarms, communicating them to plant management and enabling the remote operation of the system, and a classifier based on SVM algorithm.

Source: Elhuyar Fundazioa

Citation: Machine vision for hot surface automatic inspection (2009, September 15) retrieved 20 April 2024 from <https://phys.org/news/2009-09-machine-vision-hot-surface-automatic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.