

RECOGNITION OF WINDING DISPLACEMENTS FOR STEEL COILS VIA LASER LIGHT SECTION TECHNIQUE

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ABSTRACT:

To satisfy the ever increasing quality standards of today's steel industry the basic products, in this case steel coils, must be produced within very small tolerances. To achieve those quality limits, control systems via machine vision are getting more and more popular. For example the quality level of steel coils decreases due to winding displacements based on a non-ideal production process. In this paper a machine vision system for the recognition of winding displacements of steel coils based on the laser light sectioning technique will be presented. Our experimental setup shows that a recognition of winding displacements is possible with sufficient accuracy by using the laser light section technique. Several details of the setup helping to improve the final result, like an optical filter and the alignment of the laser are discussed more detailed in the final paper. The introduction of the mathematical model of the laser light sectioning setup allows to compensate some influences of the setups inaccuracies. We show that a reliable recognition of the coil profile with an accuracy of up to 1~mm can be achieved by a rather simple adaptive algorithm. Finally defects can be detected accurately out of the recognized coil profile.

TOPIC: Remote sensing applications

ALTERNATIVE TOPIC: Image processing and pattern recognition