A Novel Edge Sensor for Web Guiding

Article

Authors

Aravind Seshadri, Anil Abbaraju and Prabhakar R. Pagilla

Publication Information

Conference: Smart Structures and Materials 2006: Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems
Volume:6174, April 11, 2006

Abstract

Existing edge sensors use the concept of blocking/unblocking for measuring web lateral position. The most commonly used sensors employ either ultrasonic or infrared signals to detect the web edge position by measuring the amount of signal attenuation due to blocking/unblocking of the signal. The main drawback of this sensing method is nonuniform signal attenuation due to web material variations and opacity. The research in this paper develops a new sensor which utilizes the phenomena of light scattering from the web edge and the directional sensitivity of optical fibers. A collimated laser beam is incident on the web edge and scattered light is collected by a linear array of fibers spatially positioned above the web edge. The theory of operation and the development of the sensor is described. Experiments are conducted with different web materials to validate the proposed sensing method. A representative sample of the results are presented and discussed.

Link to the Article