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Defect Scanning Technology In The Works



A computer operator scans lumber through a multiple sensor machine.

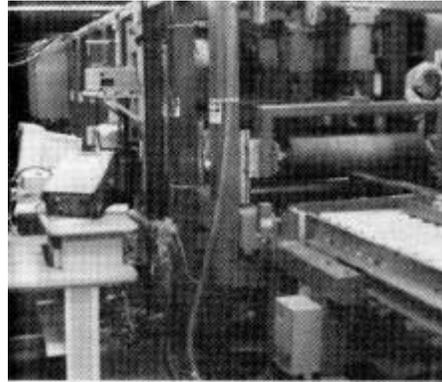
Atlanta, Georgia —New defect scanning technology is being developed by Virginia Polytechnic Institute and U.S. Forest Service scientists in Blacksburg, Virginia.

The project, funded in part by the International Woodworking Machinery & Furniture Supply Fair, has garnered international media attention in recent weeks, including coverage by CNN News, which took cameras to the factory and the research lab for a look at the developing technology.

Using Singer Furniture Co., Roanoke, Virginia, as an example of how lumber is currently checked by human eye for knot holes and other defects, the report moves on to VPI. It is there where the Center for Automated Processing of Hardwoods at Brooks Forest Products Center is building equipment which is expected to automatically recognize subtle defects in wood, which are difficult to detect.

VPI's "Robo-Eye," a term coined by CNN, is a multiple sensor machine vision system being developed to scan full-size hardwood lumber at industrial speeds for automatically detecting knots, holes, wane, stain, splits, checks and color. The prototype integrates a multiple sensor imaging system, a materials handling system, a computer system and application software.

"The prototype is being used to address a number of primary and secondary hardwood manufacturing problems, including automatic lumber grading, automatic color



The "robo-Eye" system recently received media attention from CNN News.

sorting of parts and saw mill/rough mill automation," said Philip Araman, U.S. Forest Service project leader and one of six researchers working on the VPI project.

Vision sensor machines are not new. Various types use microwaves, capacitance sensors, x-ray imaging, laser scanning or optical scanning to detect certain kinds of defects. The uniqueness of the VPI multiple sensor machine is that researchers are hoping to develop a general purpose unit that can perform multiple tasks.

By integrating information from color cameras and other sensors such as laser-based ranging camera systems and x-ray scanning sensors, a variety of defects can be noted by one machine, VPI researchers report. For example, knots may be the same color as clear wood. By using only color image sensing, knots could be mis-classified as clear wood. A multiple sensor vision system will eliminate or reduce this type of error.

According to VPI researchers Earl Kline and Richard Conners and U.S. Forest Service researchers Araman, Daniel Schmoltdt, Robert Brisbin and Jan Wiedenbeck the general purpose machine, once the technology is fully developed, should be able to automatically check lumber for surface features (knot holes, splits, decay, color, grain orientation), for board geometry (warp, crook, wane, thickness variations, voids) and for internal features (honeycomb, voids, decay), etc.

The October issue of Business Week magazine and the December edition of Popular Science magazine have also given coverage to the revolutionary project.

The biennial International Woodworking Machinery & Furniture Supply Fair is one of the largest and most comprehensive arenas for reviewing new industry technology from around the world.

IWF '94 is owned and sponsored by the American Furniture Manufacturers Association, the Wood Machinery Manufacturers of America and the Woodworking Machinery Importers Association.

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