

## Field Study Results of a skin detecting Safety Sensor on Circular Saws

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### ABSTRACT

On the last SIAS conference in Tokyo we presented a new sensor approach for the prevention of hand injuries at circular saws. A dedicated light curtain detects the intrusion of an operator's hand into the dangerous zone near the blade. The system distinguishes between skin and wood or other relevant material by a simplified spectral analysis of near infrared radiation reflected from the surface of objects in the area of interest. The detection works reliably and fast. The investigations up to now only cover applications where wearing gloves is not allowed. Meanwhile we have designed a further improved version of the sensor system and we assume that the sensor principle permits a comprehensive and economical protection means for the - despite of all recent improvements - still very accident-prone circular saws. The sensor system had shown a fast and reliable contactless detection of fingers approaching the danger zone of a rotating saw blade in the laboratory environment. The reaction time of a few milliseconds allows to issue warnings or to engage suited means to prevent the contact of the hand with the saw blade. The next step was to build a set-up for a field-study in a real application to verify the robustness of the hardware against typical influences, as well as to test the acceptance by carpenters. A system for web-based logging, maintenance, observation and access of collected data was set up for this field-study. It features a camera which records the carpenter's hands during normal work permanently and stores the sequences in case of a detected intrusion into the dangerous zone. This is important to see if the system is hindering the workers in any way and to proof its correct operation.