

**Research Title:** Design and Development of Thermal Imaging Machine Vision System for Automatic Foreign Bodies Detection in Grains

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### **ABSTRACT**

This research presents the design and development of thermal imaging machine vision system for automatic foreign bodies detection in grains by detecting foreign matter in the rice and roasted coffee as cases study. The type of foreign matter is mixed in the stone, wood chips and plastic. For the thermal processing is divided into two parts: 2D image processing that can identify foreign objects by processing the area and the diagonal of the object; thermal imaging processing can identify foreign matter by using different color processing of thermal images after the object is heated. Different objects having different thermal properties; therefore, the radiant heat dissipated to the thermal imager of different objects is also different. The testing of the operation in real-time system can be validated. The percentage of errors from wood and plastic chips were 14.87%, 6.24%, and 13.81%, respectively.

**Keywords:** Thermography, Image processing, Thermal properties, Grains, Foreign bodies