

**Research Title:** Detection of Foreign Bodies having Similar Physical Properties to Grains using Computer-based Thermal Infrared Vision System

**Researcher:** 1) Assoc. Prof. Dr.Navaphattra Nunak

Faculty of Engineering, Department of Food Engineering

2) Assoc. Prof. Dr.Taweepol Suesut

Faculty of Engineering, Department of Instrumentation and Control  
Engineering

3) Dr.Eakasit Sritham

Faculty of Engineering, Department of Food Engineering

### **ABSTRACT**

This research report proposes the detection algorithm to detect foreign bodies in grains using the processing of Thermal Image (TI) in the infrared region. Job's tears having the similar color to foreign bodies (wood, stone, rope and plastic) were selected to be experimental samples. The experimental set up consists of two main devices; the heat source and thermographic camera. TI was captured after samples heated for 20 seconds and cooled for one second. Smartview and Image J were used to processed and analyzed the TI with the five steps of image processing; thermal image acquisition, converting gray scale image, image segmentation using threshold, image enhancement using watershed tool and image classification using area and roundness. From the results, it can be concluded that this technique has a potential to detect foreign bodies in Job's tears using the difference of thermal properties of materials.

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