

## Pre-Analysis of Printed Circuit Boards Based on Multispectral Imaging for Vision Based Recognition of Electronics Waste

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**Abstract :** The increasing demand of gallium, indium and rare-earth elements for the production of electronics, e.g. solid state-lighting, photovoltaics, integrated circuits, and liquid crystal displays, will exceed the world-wide supply according to current forecasts. Recycling systems to reclaim these materials are not yet in place, which challenges the sustainability of these technologies. This paper proposes a multispectral imaging system as a basis for a vision based recognition system for valuable components of electronics waste. Multispectral images intend to enhance the contrast of images of printed circuit boards (single components, as well as labels) for further analysis, such as optical character recognition and entire printed circuit board recognition. The results show that a higher contrast is achieved in the near infrared compared to ultraviolet and visible light.

**Keywords :** electronics waste, multispectral imaging, printed circuit boards, rare-earth elements

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