



Daniela Florian: Implementation and Evaluation of an Autofocus and Registration Algorithm for Infrared Microscope Imaging

Description

This thesis is realized at KAI – “Kompetenzzentrum Automobil- und Industrieelektronik GmbH”. The thermal characterization of power semiconductor devices is an important challenge in the industrial electronics and automotive sector. Infrared thermography is used to measure the temperature distribution on semiconductor devices, especially the heating up process influences the measurement result due to mechanical and thermal movements. Additionally, a displacement in the image plane of the device under test can occur. For the calibration, a pixel-by-pixel registration of individual images is required.

This master thesis deals with the evaluation of different autofocus and image registration algorithms especially for infrared images. An offline evaluation of three different autofocus methods is performed to determine which of them obtains the best result. The selected method is implemented in the existing infrared measurement setup. Further, two image registration algorithms are implemented to determine the displacement in the image plane. Both are evaluated and compared. Both algorithms provide good results. The main differences between these algorithms are the computing time.

Advisor

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