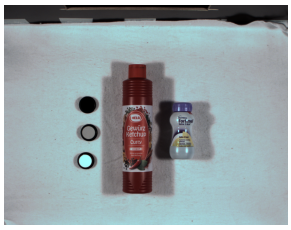
**Lehrstuhl für Multimediakommunikation und Signalverarbeitung**
Universität Erlangen-Nürnberg

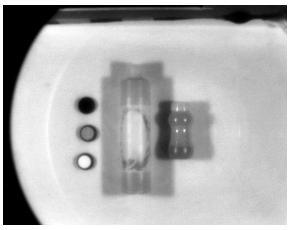
# Proposal for a Bachelor Thesis

**Topic:** **Evaluation of Denoising Algorithms for Multispectral Infrared Imaging**

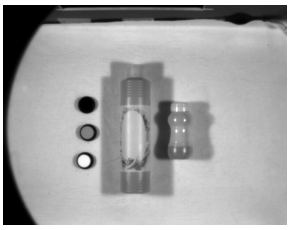
**Description:** Today, multispectral camera arrays are widely used in various applications, such as material classification or remote sensing. In such array setups, the cameras are equipped with infrared filters, each capturing a different spectral range. However, as the wavelength increases, the recorded images become noisier. This increased noise level leads to a substantial loss of information, which can strongly affect the quality of subsequent image analysis and classification tasks.



(a) Noise-free RGB image



(b) Noisy IR image



(c) Denoised IR image

To address this problem, denoising algorithms can be applied to improve the image quality and recover lost information. Therefore the goal of the proposed thesis is to evaluate and compare different existing denoising algorithms on infrared image data obtained from a multispectral camera array. Special focus is placed on the performance of the algorithms across different wavelength ranges and their ability to preserve important image details while reducing noise.

**Tasks:**

- Investigation of existing noise reduction algorithms
- Conduction of experiments
- Evaluation and comparison of results

**Prerequisites:** Experience in python programming

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**Verfügbar:** Sofort (Oktober 2025)