



Master thesis / Diplom- / Studienarbeit

Development and implementation of a monitoring system based on image processing

Theoretical / Practical

General conditions:

- Duration: 6 months
- Basic operation of Matlab
- Able to work independently
- Interest in image processing

Contents:

As a part of the cooperative research with industrial a production process of a **Bucket-wheel excavator** should be automated. A cognitive monitoring system based on a multisensor data as well as decision fusion should be realized, This monitoring system should provide a reliable decision about the state of the production process, where the presence of undesired objects within transported material has to be detected to avoid later on disturbances and failures during the transportation process.

The production process is currently monitored manually. An operator monitors the process through a video camera. The video camera allows the operator to see the undesired objects through the transported material. The path of the transported material is changed by the operator, if an undesired object being detected by him.

The goal of this work is to realize an automated monitoring system for the production process based on the video camera signal. Therefore the video signal should be processed using the image processing toolbox in Matlab to extract the relevant information about system states. The state of the transported material (object present yes/no) should be classifiable upon to the extracted information. An appropriate classification algorithm should be realized in order to perform an automated detection system based on the relevant extracted information.

This work includes the following tasks:

- Literature research in image processing
- Preparing the video signals
- Extracting the relevant features
- Realizing an appropriate classifier to classify system states.

Literature research, feature extraction methods, and classification results have to be documented in detail and handed out in hardcopy and digital form respectively. The results have to be presented within an oral presentation.



Fig. 1: Bucket-wheel excavator