TECHNISCHE HOCHSCHULE LÜBECK

[Abteilung/FB]
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INDUSTRIAL ROBOTICS – PRACTICAL WORK PART 3: MACHINE VISION

Prof. Dr.-Ing. Thomas Wich

Objectives:

In this experiment, you will learn basic steps of image processing and implement them in a small application.

Preparation:

1. Download the National Instruments Vision Development Module as an evaluation version (https://www.ni.com/de-de/support/downloads/software-products/download.vision-development-module.html#409842) and install the software. We need the "Vision Assistant" in preparation and laboratory tests.
2. As an alternative to installation on your own computer, you can also use a virtual machine running on your computer. Please install the Virtual Box host software (https://www.virtualbox.org/wiki/Downloads) for this.
3. Read the "Vision Assistant" tutorial and set the examples at home as preparation:
    1. "Using Particle Analysis to Analyze the Structure of a Metal" (Chapter 3) and
    2. "Using Gauging for PartInspection" (Chapter 4).

    The required test images and documents can be found in the learning room.

Required parts:

1. Webcam Logitech C270, tripod with mount
2. 1 sheet DIN A3
3. PC with NI Vision Assistant software installed and NI webcam drivers installed
4. 1 dice

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Task: Eye number recognition on a dice

On a dice, the number of eyes is to be determined automatically by means of image processing. For this purpose, two different detection approaches must be used.

1. What methods can be used to determine the number of eyes? Formulate at least two approaches.
2. Which steps of image pre-processing should be used here? Check your approaches on the real object and document your results.
3. Implement both procedures from Task Part 1 and demonstrate their function.
4. Which approach delivers the better results? Evaluate the two procedures and justify your answer.

Document your results in a Word document (with screenshots).