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Entwicklung einer automatisierten Messreihenverarbeitung mit statistischer Auswertung.

ABSTRACT - Masterthesis

Implementation of an automated measure data processing tool including statistical evaluation

Nowadays measuring systems are present in everyday life. Every smart phone includes at least a position and a brightness sensor, in cars different sensors are the requirement for an abundance of assistance systems and traffic lights detect cars by image processing. All these systems wouldn't work without the correct evaluation and interpretation of the measure data.

This key feature is also very important for the company Automotive Testing Papenburg (ATP) which operates a huge testing area for commercial vehicles and its components. The company wants to improve their engineering service to equip a customer vehicle with measure equipment and evaluate the measure data. For the illustration and evaluation the engineers use the software DIAdem. Regarding to the manual handling in DIAdem until then the amount of time for processing the measure data increases with the length and number of measure channels (included in the measure data).

So the objective of this master thesis was to implement an automated measure data processing tool inside DIAdem. The possibility is given by the SCRIPT environment of the software which offers the development of a graphical user interface and programming in Visual Basic. Furthermore the company wanted to get a relation between the different routes on the testing area and everyday scenarios outside on the streets.

As a result a measure data processing tool was implemented with ample functionality. Beside basic operations like editing channel names, channel units or channels itself, the tool provides the opportunity for a quick illustration of the measure data by time with several settings. Moreover one can sight and compare the estimated density functions by histograms of different sets of measure data. Furthermore the user gets a value between 0-100 for the congruence of two histograms applying the cross correlation. For this an assessment scheme was worked out.

In favor of more statistical evaluation the tool provides for each measure channel important statistical values such as min./max. value, median, mean value, variance and standard deviation.

To get a relation between different sets of measure data their histograms are included in the evaluation. The objective is to reproduce the intended external histogram, which is the result of the set scenario outside the testing area. So the user has to find the optimal ratio between the chosen internal routes with the result that the internal histogram (sum of the weighted histograms) equals to the course of the external histogram. To support the user at this task a least square estimation for the internal factors is implemented.

With the measure data processing tool the ATP is able to evaluate quickly any kind of measure data.