

Automated Evaluation of Abrasion Tests of Motorcyclists' Protective Clothing

Relevance to the Automotive Industry:	Looking at the overall traffic fatality rates and severe injuries, it can be observed that motorcyclists are highly overrepresented compared to car occupants. Hence, in addition to active safety measures to prevent motorcycle accidents, it is of utmost importance that the protective capability of clothing for motorcyclists be advanced to save lives.	
Research Location:	TUD Fahrzeugtechnik (FZD)	
Homepage (Engl.):	http://www.fzd.tu-darmstadt.de	
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Project Description:	<p>For almost 30 years, FZD has performed research on improved protective clothing for motorcyclists. Their unique testing procedure and test rig enables material scientists and manufacturers to assess the friction behavior of protective clothing for motorcyclists on various road conditions. In the current version of the FZD abrasion test rig for protective clothing, the chain of signal processing involves many time-consuming and error-prone manual steps, such as reading numbers from various displays, typing them into a MS Excel spreadsheets, etc.</p> <p>The objective of this NSF REU project is to automate the evaluation of abrasion tests by using a data acquisition system to feed data directly into MATLAB routines. This new automated data collection and processing system will need to be validated against the traditional manual data collection and processing system. Hence, this project effort will include:</p> <ul style="list-style-type: none"> • Practical work with the test rig (acquire reference data); • The analysis of the present system and test evaluation method; and • The development of MATLAB routines for an automated evaluation with tabular and graphical representation of test-results. 	
May 23 - Jul 15, 2011; (8 weeks, 40h/week)		
Target publications:	<ul style="list-style-type: none"> • Technische Textilien / Technical Textiles • Forward Textile Technologies <p>Please note that publication of abrasion tests is usually delayed in order to protect intellectual properties. However, it is the intention that the NSF REU student will co-author one or more publications on the above research effort at the first possible opportunity.</p>	
Necessary Skills/ Knowledge:	<ul style="list-style-type: none"> • High motivation to work independently • MATLAB 	
Desirable Skills/ Knowledge:	<ul style="list-style-type: none"> • Electrical engineering • Signal processing 	
Additional Online Resource(s):		

NSF REU Students must have completed at least two semesters of engineering studies prior to the proposed summer research, and they must have at least one semester remaining before they can earn their BS in Engineering.