

Photographic Verification of Road Maps

Relevance to the Automotive Industry:	Product testing is an integral part of the engineering design and development process. An increasing amount of this testing is done earlier in the design process using virtual prototyping and simulation. This enables more product testing, faster, sooner, and at less expensive than what is possible in physical prototyping and product testing. The result is faster product introduction with improved quality.	
Research Location:	VT Vehicle Terrain Performance Laboratory (VTPL)	
Homepage (Engl.):	http://www.me.vt.edu/VTPL	
Faculty Mentor:	Prof. John B. Ferris, Ph.D.	
Faculty Mentor Email:	jbferris@vt.edu	
Graduate Mentor:	Craig Altmann, MS	
Graduate Mentor Email:	altmanct@vt.edu	
Project Description:	<p>The mission of the Virginia Tech Vehicle Terrain Performance Laboratory (VTPL) is to improve the performance of ground vehicle systems by studying their interactions with the pavement. Toward this end, measuring the pavement surface is critical and verifying these measurements is an integral part of this step. The proposed NSF REU project is the installation, and triggering of a camera to capture pavement surface images while the host vehicle is acquiring scanning laser data of the pavement surface. These images must be time-stamped and geo-referenced to the GPS system being used as part of the data acquisition package.</p> <p>It is desirable that the NSF REU student at VTPL in Blacksburg stay abreast with the NSF REU project at the Institute for Automotive Engineering (FZD) in Darmstadt to explore future opportunities for combining these two sets of data collection technologies to feed a more comprehensive vehicle simulation system.</p> <p>PHASE A (2-3 weeks): During this introduction phase, the NSF REU student will review relevant research, and investigate existing software and hardware. This will culminate in a final research plan and proposed equipment orders (as needed).</p> <p>PHASE B (3 weeks): Next, the student will develop a preliminary mounting structure and triggering set-up for the camera.</p> <p>PHASE C (3 weeks): Next, the student will finalize the installation and operation of the equipment and verify the results with local roads around Blacksburg.</p> <p>PHASE D (1-2 weeks): Finally, the NSF REU student will document the research performed, prepare a written report to support subsequent publications, and deliver an end-of-summer presentation on the research performed.</p>	
Jun 06 - Aug 11, 2017 (10 weeks, 40 h/week)		
Target publications:	<ul style="list-style-type: none"> • 2018 SAE Word Congress 	
Necessary Skills/ Knowledge:		
Desirable Skills/ Knowledge:		
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.