Identifying the 95th Percentile Customer

Relevance to the Automotive Industry:	Understanding Customer Usage is an integral part of the engineering design and development process. Properly identifying the 95th Percentile Customer is essential 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, PhD Candidate
Graduate Mentor Email:	altmanct@vt.edu
Project Description: Jun 04 - Aug 10, 2018 (10 weeks, 40 h/week)	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, understanding the influence of the pavement surface (the true vehicle input) on vehicle reliability, the prediction of this reliability, and the design of vehicles for improved reliability are critical. The proposed NSF REU project is to study measured pavement surface data and analyze the pavement surfaces with regard to their potential influence on vehicle fatigue and estimation of the 95th Percentile Customer Usage. **PHASE A** (2-3 weeks): During this introduction phase, the NSF REU student will review relevant research, and investigate existing methods, analysis software, statistical techniques, and existing data. The student will also begin processing pavement surface data from customer sites (previously acquired). This will culminate in a final research plan. **PHASE B** (3 weeks): Next, the student will complete processing surface data and develop new concepts for 95th Percentile Customer Identification. **PHASE C** (3 weeks): Next, the student will apply and assess the concepts for identifying the 95th Percentile Customer using the newly processed customer data. **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.
Target publications:	• 2019 SAE World Congress
Necessary Skills/ Knowledge:	• Basic understanding of probability and statistics, willingness and competence in teamwork, some modeling and simulation experience
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.