UTC Project Information	
Project Title	Evaluating Emotion Regulation Techniques for Supporting Driving Safety and Performance
University	Texas A&M University
Principal Investigator	Thomas K. Ferris
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Funding Source(s) and Amounts Provided (by each agency or organization)	TTI - $68276
Total Project Cost	$68276
Agency ID or Contract Number	Grant No: 69A3551747115 Project: TTI-STUDENT-09
Start and End Dates	06-01-2021 to 08-31-2022
Brief Description of Research Project	Humans operating motor vehicles are often required to engage in decision making while under substantial cognitive loads imposed by the driving environment itself. Experiencing elevated emotions can influence driver decision making in a way that increases risk to the safety of the driver and system performance. Emotion regulation techniques (ERTs) can be used to improve driving safety and performance; however, these techniques can only be effective in an operational driving context if they impose minimal additional cognitive loading on the driver, thus avoiding issues with distraction and increased workload that could further impact decision making, driving performance, and safety. Additionally, due to motivational factors influencing individual drivers, ERTs that can be activated with greater subtlety (less obvious to the driver) may be more effective than those that are perceived as more obvious and potentially condescending. To determine effective methods that ultimately improve driving safety, two classes of ERTs will be evaluated in this study: those that are classified as "overt", such as explicitly prompting drivers to perform a cognitive re-appraisal of the situation, and those classified as "covert", such as introducing subtle cues that influence physiological systems, such as synchronizing breathing patterns in a manner that is effective in regulating emotions. Given that affective states can be manipulated with little or no conscious engagement, covert ERTs that minimize cognitive demand, and perhaps even work subconsciously, may be well suited for supporting drivers in

	an active driving context. The findings of this work can provide design guidance for future driver systems design.

Describe Implementation of Research Outcomes (or why not implemented)
 	
Place Any Photos Here
	EWD Plan:
	      This proposed research will help enhance education experience for many graduate and undergraduate students by providing opportunities to conduct research, write publications, etc. PI and graduate student are actively involved in supporting undergraduate research in the university via the Aggie Research Leadership Program (ARLP). Students will also be provided opportunities to present at outlets like the TTI Traffic Safety conference, IISE, Undergraduate Research Week, etc. Additionally, Ferris will work within his role as Track Coordinator for the TAMU Engineering Honors program to recruit a cohort of ISEN-EH students (those taking the required human factors undergraduate course, ISEN 330, which Ferris often teaches) to engage them in enriched class-related activities that interface with this project. In particular, many of the "develop and pilot test" aspects of the various tasks in this project will be led, as often as possible, by undergraduate research groups, overseen by Ferris and Susindar. These opportunities will aid in providing vital experience and exposure to students who will eventually become a part of the U.S. workforce.
	
	T2 Plan:
	      Explore technology transfer opportunities to develop some of the emotion regulation techniques identified.

Impacts/Benefits of Implementation (actual, not anticipated)	Anticipated benefits include: 1. Informing surface transportation research and applications on driving under the influence of emotions 2. Informing surface transportation research and applications on interventions for driving under detrimental emotional loads

	3. Potential for development on in-vehicle technologies for emotion regulation 4. Development of driver training modules or driver education for awareness of the influence of emotional loads on driving

Web Links
   • Reports
   • Project website
	https://safed.vtti.vt.edu/projects/evaluating-emotion-regulation-techniques-for-supporting-driving-safety-and-performance-2/