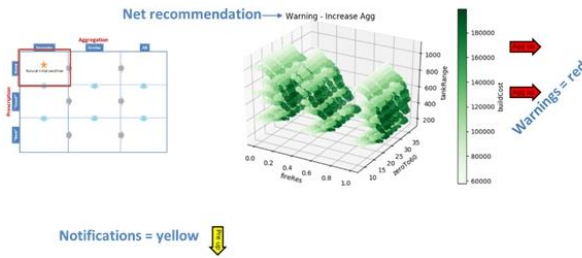


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**Title**

Tailorable Tradespace Analysis of Mobility and Survivability for Ground Vehicles (TTAMS-GV)

**Contract Number**

W56HZV-17-C-0164

**SBIR Topic Number**

A17-107

**Proposal Number**

A171-107-1568

**Summary Report Type**

Phase I Final

**Description and Anticipated Benefits**

The Perduco Group has developed a framework (TTAMS-GV) for conceptualizing, at different levels of automation, the design of ground vehicles: providing guidance to analysts and engineers regarding how a tradespace should be created and explored in order to best gain insights about the tradeoffs between key performance attributes such as mobility and survivability. The automation controls considered in this Phase I project were the use of aggregation (how should attributes be combined into value?) and prescription (how should data be filtered to emphasize “good” alternative designs?). The different possible choices for both of these types of automation result in a wide range of potential tradespace formulations which represent tradeoffs between human and computational exploration effort. Indicator metrics of two levels of severity (notification/warning) were also developed to assess these different formulations for the quality of analysis they enable, which is dependent on the case, the human users, and the available computational resources. The net recommendations of these indicator metrics can be used to improve the quality of an analysis effort by

adjusting automation in a beneficial way, best leveraging the complementary strengths and weaknesses of human and computer. TTAMS-GV was demonstrated on a proxy ground vehicle model in order to illustrate the differences in the types of available insights when conducted at different levels of automation. Though the project was conceived with this use case in mind as per the original topic, the newly developed framework and indicator metrics are fully applicable to any system-level design problem. As such, there are many potential customers both within the DoD and without who could benefit from TTAMS-GV: particularly those with large potential design spaces that must utilize some form of automation (e.g. optimization) in order to process the data to a point at which it is feasible for a human to analyze. TTAMS-GV can assist the practitioner in finding the amount of automation that best supports their analysts while still leveraging their human insight. The Phase I project was not scoped to include a fully developed software package or GUI, so the current set of command-line tools requires some degree of familiarity with the concepts. A future Phase II/III would entail development of a user-friendly interface for leveraging the TTAMS-GV framework, such that it could be more easily transitioned to customers, including those with minimal training in tradespace exploration.