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Identifying and Quantifying Critical Information Streams for Tactical Combat Decision Modeling

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Abstract: It is often asserted that more information on the battlefield leads to greater situational awareness (SA) which, in turn, translates to enhanced mission performance and outcomes. However, the volume of available information on the modern networked battlefield is extensive and growing, which induces risk of indecision due to cognitive overload. The potential overload highlights the need to streamline the flow of information to those critical streams that provide the most value to a tactical leader's decision process at particular points in time. The purpose of this study is to identify critical information streams required by tactical leaders within the various phases of a dismounted search and attack/react to contact scenario. Domain Mapping Matrix methodology (DMM) is utilized to quantify the value of various information streams relative to the sub-phases within the scenario using a constructed nominal scale. The significance of the highlighted interactions is validated through the use of statistical analysis, with combat veterans serving as test cases. The findings of this study will facilitate the development of decision models that will eventually enable more accurate and realistic simulation of the leader's decision processes that increased SA purportedly enhances.

Keywords: Situational Awareness, Domain Mapping Matrix, human decision modeling