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# Value Modeling and Trade-Off Analysis of the Tactical Assault Light Operator Suit

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**Author Note:** Cadets Fairbrass, Genders, Perez-Ortega, and Swisher are all members of the Department of Systems Engineering at the United States Military Academy. This paper presents research performed for a Capstone Project in support of Joint Acquisition Task Force – Tactical Assault Light Operator Suit (TALOS), US Special Operations Command (SOCOM).

**Abstract:** The Tactical Assault Light Operator Suit (TALOS) is a powered, armored exoskeleton designed to enhance an operator's survivability, lethality, and mobility. The suit is a SOCOM initiative using rapid acquisition practices with a functional prototype expected in 2018. Value modeling allows the TALOS design teams to rapidly perform design trade analysis while ensuring that the proposed system is in-line with the operator's needs. A stochastic value model was built for the power subsystem through an analysis of the requirements to develop value hierarchies, swing-weight matrices, and value functions. An Excel based tool performed trade-off analysis to determine the best design solution. This tool accounts for uncertainty in raw data values to create distributions in the cost and value of each design alternative, which is critical for assessing risk. The model was expanded to other subsystems as well as the suit as a whole.

*Keywords:* Trade-Off Analysis, Value Modeling, Design Alternatives