***Abstract*—Recent research has shown that wilderness search and rescue (WiSAR) can be aided through the use of unmanned arial systems (UASs). A single UAS, however, requires several human operators to manage the interface between the UAS vehicle and the larger search and rescue efforts on the ground and in the air that are coordinated by the central command center. For UASs to scale to real-world wilderness search and rescue scenarios, it is important to reduce operator workload and mitigate the effects of stress and fatigue through effective distributed control and augmented autonomy. A primary challenge in any effort to understand distributed control is in effectively modeling the various roles in the system from the humans, to the GUI, to the actual UAS in the physical environment. This paper discusses a Java model that explicitly formalizes the individual roles of the WiSAR UAS that can be model checked by Java Pathfinder to establish its intended behavior. The model is the basis for research on human machine interfaces to support combined human roles that reduce operator workload. In essence, by modeling each individual role in WiSAR, it is possible to then perform role fusion and show that the new UAS with combined roles, increased autonomy, and new interfaces is a correct implementation of the original system. The experience of this modeling activity suggests that modeling WiSAR or any system will be at least as hard as any solution to distributed control or role fusion.**

***Index Terms*—Keywords goes here.**

I. Introduction

Problem Statement: UASs require several human operators to monitor and administer.

II. Related Work

Creating digital models of the real world is taking place in many disciplines. From video games to NASA more people are obsessed with finding, producing, and examining these digital models in order to better understand and replicate real world events. Brahms is a robust modeling language that involves agents, geographies, and objects. These can also be thought of as the people involved, their environment, and the objects or tools they have to work with.

NASA Ames Research Center is using Brahms to model interactions between operators and their aerial equipment. These complex models have given new understanding to both the instances studied and the language itself. In their study of the Uberlingen collision the model, produced using the Brahms language, Neha Rungta and her colleagues were able to correctly predict the collision. Such a model could have forewarned the air traffic controller of the collision.

WiSAR, Wilderness Search and Rescue, is primarily concerned with the finding people who have become lost in rugged terrain. () Research has shown that UAVs, unmanned aerial vehicles, facilitate the work this group is doing. In principle the vehicle is used to search for victims in areas that would be difficult for ground teams to reach. Michael Goodrich and his colleagues tested the effectiveness of these types of operations. They found that altitude and video clarity determined the success of the mission. Furthermore they supposed that these factors could be enhanced if the roles of the UAV operator and video operator were combined.

III. Conclusion

The conclusion goes here.

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