Thesis Portfolio

User Experience Design for Human-Machine Teaming in Commanding a Distributed Constellation of Unmanned Assets in Search and Rescue

(Technical Report)

Actor-Network Theory analysis of Unmanned and Autonomous Military Technology and the Effect on Society's Definition of War

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The technical topic in this portfolio focuses on designing a user interface used to oversee the operation of a constellation or fleet of autonomous search and rescue drones. The project was centered around the idea of building trust in automation, while actual programming and implementation of the interface were out of the scope of the project. This concept is important so that the operator is not constantly changing the decisions the autonomous drones are making, but has the ability to when the drones seem to be malfunctioning. These malfunctions are showcased through the interface. A user evaluation of the completed interface was conducted with members of a local search and rescue team which proved the interface was effective.

The STS research paper also concerns unmanned and autonomous technologies, but for military operations. This analysis demonstrated by increasing the use of such technologies the ethical considerations surrounding warfare and how society ultimately defines war changes. Actor-Network Theory analysis shows that by adding unmanned and autonomous technologies to the actor-network society changes.

Working on these two projects allowed me to better understand how autonomous technologies can be helpful, but also harmful if not implemented correctly. For example, in the case of search and rescue drones, they can locate a lost individual faster than a ground search team. But, if the operator overseeing their actions must be able to correct the drone's actions if the autonomous programming fails. In the case of the use of autonomous military technologies, a clear set of rules have to be provided for the technology to follow, or else the decisions it makes could negatively affect the mission. Lastly, it was interesting working on both projects because the interface designed for the technical topic could very well be used for a fleet of autonomous

military drones. Because of this, I predicted how the interface would fit into the various ethical considerations and viewpoints in a military setting.