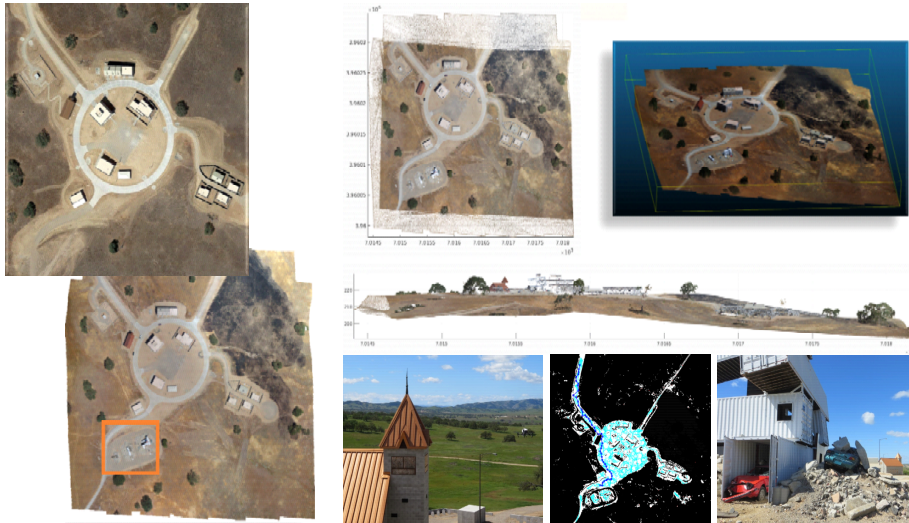
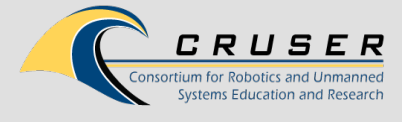


Mission Planning in Support of SAR Operations Involving Heterogeneous UxS



Modeling CACTF environment for planning a joint UAS-UGS mission.

How

- This research will involve fourteen students from four departments (SE, MAE, PH, and CS) working in two teams applying a systems engineering approach to perform a conceptual design of a SAR-type mission involving multiple heterogeneous UAS and UGS.
- They will build two UGSs featuring EO sensors (to provide situational awareness and detect specific features (color, movement)) and the means to communicate with UAS (which will be used to provide UGSs with an overhead view of the CACTF crush site area and also as a relay station for a mission control to feed information about UGSs executing a mission back to the command and control room).
- Students will develop and integrate algorithms allowing to conduct scene recognition, path optimization / following, and image processing.

What / Deliverables

- The objective of this research is to develop and validate a framework for planning a generic search and rescue (SAR) type mission that fully exploits advantages of utilizing multiple heterogeneous unmanned vehicles. Specifically, this research aims at developing and testing new capabilities for unmanned aerial and ground systems (UAS and UGS, respectively), working together in the areas heavily damaged by either natural, technological or social hazards.
- The developed framework is to be demonstrated and assessed within a series of field experimentation events conducted at Camp Roberts Collective Training Facility (CACTF). The development will include conceptualization of a SAR-type mission, development of overarching system architecture, including joint UAS-UGS command and control, design and upgrade of two of the NPS' UAS and UGS to meet mission requirements.

Why / Objective

- The Department of Defense is looking to develop novel capabilities for unmanned vehicles proving their superiority/effectiveness in conducting a variety of autonomous missions including SAR-type missions in disaster areas. The latter represent typical examples of “dull, dirty, or dangerous” missions, where the usage of unmanned assets seems to be most beneficial.
- This research seeks to consider a typical SAR-type mission and develop a complete framework addressing it using multiple heterogeneous unmanned assets.
- The research is anticipated to be multidisciplinary (including hardware, software, and human systems considerations) and involve students from multiple curricula.



FY18 Call for Proposals

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