



JIFX
Joint Interagency Field Experimentation



JIFX 17-4 Quicklook

From the Director:

Experiments at JIFX 17-4 spanned a wide range of technologies and mission sets, with the primary event focusing on Counter UAS. We had four teams with UAS identification technologies that tested their capabilities on a wide range of drones in various settings. The different environments surrounding McMillan Airfield and inside the Combined Arms Collective Training Facility (CACTF) allowed for each of these technologies to test their capabilities in significantly varied environments – including both natural landscapes around McMillan and within the developed areas of the CACTF. Other exciting experiments include a Naval Postgraduate School research team, lead by Dr. Gurminder Singh and Dr. John Gibson, where they installed a low-cost ground sensor network with facial recognition for surveillance and intrusion detection in various locations around the airfield and at the CACTF, and Carnegie Mellon tested a new low-cost technology to quantify and classify vehicles driving over their device. They tested 8 different vehicles driving at 6 different speeds – including speeds of over 90 mph!

A thank you to the team from the Defense Innovation Unit Experimental (DIUx) and the NPS Advanced Robotic Systems Engineering Laboratory (ARSENL) for flying red air drones to be identified throughout the week.

We are excited to announce that JIFX 18-1 will be conducted a bit differently than most of our previous events. We will be relocating our team to San Clemente Island to conduct the Multi-Thread Experiment (MTX). More about the details on this experiment can be found on page 5, but I wanted to note that we are not accepting any more experiment proposals for this event. We will be back to Camp Roberts for JIFX 18-2 in early 2018, so look for the experiment proposals opening up soon for that event. As always, please submit your proposals as soon as possible so the NPS team can work with you to obtain any approvals you may need to complete your experiment.

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<http://www.nps.edu/fx>

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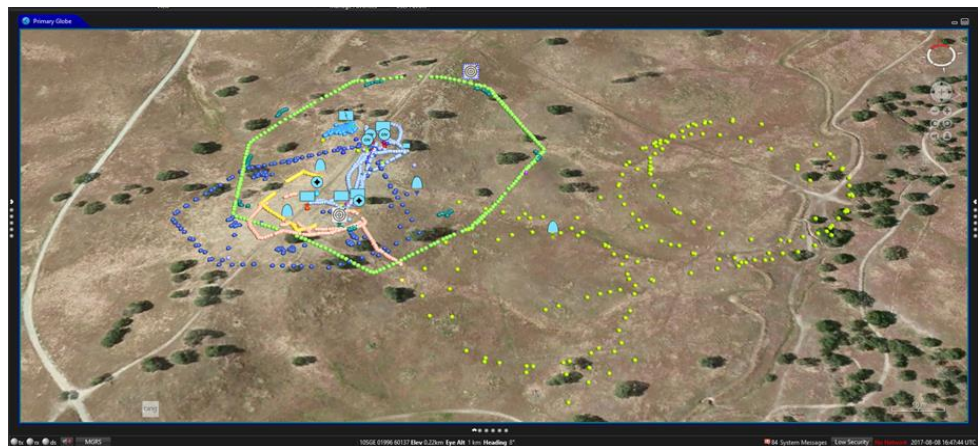


JIFX 17-4

Integrated Experiment

The Naval Postgraduate School led the participants in the execution of an integrated experiment that included the four different CUAS tracking systems identifying CUAS and sharing data across an NPS established mesh radio network using Persistent Systems Wave Radio systems. By compiling radar data from IEC Infrared's tracking system, drone RF control data from WhiteFox, and visual data from both Carnegie Mellon University and Lockheed Martin's tracking cameras/systems we were able to monitor "red force" drones in the Technical Operations Center. The systems all provided Cursor-on-Target (COT) data over the mesh network to a Raptor X display for shared situational awareness around McMillan Airfield (See photos below). The "red force" drones included a small swarm of NPS Advanced Robotic Systems Engineering Laboratory (ARSENL) Zephyr II aircraft and various commercial products flown by the Defense Innovation Unit Experimental (DIUx). The scenario enabled an integrated common operational picture that included detection, characterization and tracking that would have enabled drone engagement by the defeat capabilities under development by Lockheed Martin, White Fox and IEC Infrared.

Cursor On Target Screenshots providing situational awareness to the Technical Operations Center



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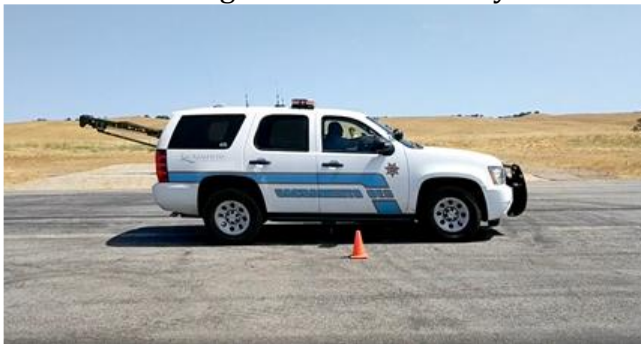


JIFX 17-4

Experiment Highlights

Emergent Needs Collaborative Assessment and Plan Enactment, Georgia Tech Research Institute
GTRI facilitated a workshop to prototype a game which models the interactions between formal and informal entities in a crisis response and to surface potential ways to further improve response and communication. The attendees of the workshop created a game called Emergent Needs Collaborative Assessment & Plan Enactment (ENCAPE): *“ENCAPE is a collaborative card-based strategy game that depends on storytelling for every action to connect the bridge between formal and informal sector responding to a crisis, to relief a crisis you must work with other players to complete a mission. Personas are built on the actual/abstract players of the crisis relief, ENCAPE is an open source that we encourage players build their personas as they imagine.”* The workshop successfully produced a prototyped game, templates for generating future aspects to the game, a white paper about the process, and a proposed workshop format for play testing and expanding the game in the future.

Rapid Wide Area Network Deployment and Assessment Carnegie Mellon University



Frame capture of a vehicle driving over the magnetometer sensors at a target speed.

Automated Visual Detection of sUAS Carnegie Mellon University



Detection of multiple identical UAS flying in formation during the integrated scenario.

Upcoming JIFX Events

Event	Dates	Location
CRUSER Warfare Innovation Continuum Workshop (www.nps.edu/web/cruser)	18-21 September 2017	Naval Postgraduate School
JIFX 18-1: MTX	November 2017	San Clemente Island, CA
JIFX 18-2	12 – 16 February 2018	Camp Roberts, CA
JIFX 18-3	14 – 18 May 2018	Camp Roberts, CA
JIFX 18-4	6 – 10 August 2018	Camp Roberts, CA

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JIFX News

JIFX 18-1: Multi-Thread Experiment (MTX)

The Consortium for Robotics and Unmanned Systems Education and Research (CRUSER) serves to enhance the development of a culture of unmanned systems across the naval enterprise. In November 2017, CRUSER and JIFX will team together to execute a maritime Multi-Thread Experiment (MTX) on San Clemente Island to provide a realistic operational scenario in a multi-domain environment (air, sea surface, and undersea). San Clemente Island is the southernmost of the Channel Islands and is located approximately 68 nautical miles west of San Diego.

The goal of MTX is to advance autonomy of a collaborative UxV Network Control System in a multi-domain environment, and explore the potential to significantly reduce "tail" required to operate UxS for military operations while harnessing the capability of these systems to actively support the warfighter.

Due to the constraints accessing San Clemente Island, participation of both experimenters and observers at the event will be very limited. We are excited to host a unique new experiment, and look forward to another collaborative event with new developments, learning and insight.

For more information about this event, please contact:

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For more information about CRUSER, please visit:
www.nps.edu/web/cruser

Disposable Network Sensor Study

NPS researchers investigating the potential use of disposable sensors to help the 7th Fleet maintain and improve their awareness of changes in their operating areas visited JIFX 17-4. The researchers, Scot Miller, Sue Higgins, and Ann Gallenson, spoke with sponsors and researchers to improve their understanding of sensor-based challenges and innovations under investigation. They had the opportunity to engage several of the researchers and sponsors present that day in impromptu brainstorming sessions. The conversations helped provide insights into the research questions being generated through sensors and the variety of data they provide. The conversations were wide-ranging, enthusiastic, and informative. The views explored and questions raised will be used (in part) to provide input to Design Sprints that will be conducted with NPS students in September and October. The researchers thank all the participants for their willingness to explore and explain the emerging world of sensors and their research interests.

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