



JIFX
Joint Interagency Field Experimentation



NPS Joint Interagency Field Experimentation 23-3 Update

The Naval Postgraduate School (NPS), in support of the Innovation & Modernization (I&M) Office in the Office of the Undersecretary of Defense for Research and Engineering (OUSD R&E), executed JIFX 23-3 at the NPS Field Laboratory on McMillan Airfield, Camp Roberts, CA from 1-5 May 2023. This innovation discovery event focused on small business and non-traditional performers exploring 20 unique technologies in a collaborative learning environment related to the field of autonomous logistics enabled by artificial intelligence and machine learning.

The JIFX team hosted 101 researchers and 77 government participants who were joined by 9 NPS students and several faculty members for the event. Participants represented 5 COCOMs (CENTCOM, NORTHCOM, STRATCOM, TRANSCOM, and SOCOM), NSW, ONR, DIU, JIFCO, MCWL, NASA, NIWC Pacific, US Army DEVCOM, US Air Force, US Army, US Marine Corps, US Navy, and two civilian universities (University of Nebraska Lincoln and University of Arizona). The NPS field lab's multi-domain environment was further enhanced by the integration of a local reservoir which provided a venue to foster an exchange of concepts and user feedback in a maritime environment. All the technologies drew great interest from stakeholders. Initial feedback is that four stood out for their potential to effect logistics operations – Innovative Algorithms' Phalanx Shield sensors, University of Nebraska-Lincoln's Multi-Agent UAS Team, Air Company's AIRMADE Fuel, and Greensight Ag's WeatherHive.

Stakeholders from the I&M, Foreign Comparative Testing (OUSD R&E IP&E/FCT), and TRIDENT WARRIOR offices also participated. They expanded our knowledge of the defense innovation accelerator ecosystem by providing overviews of their programs along with insights on how stakeholders and technology developers can benefit from working with their respective offices.

We were also pleased to welcome the Senior Technical Advisor and acting Deputy Commanding General of the US Army Intelligence Center of Excellence and Fort Huachuca. He concluded that JIFX events could serve as a venue to assist in identifying promising technologies for transition to the Vanguard Joint Intelligence and Electronic Warfare technology experimentation event held annually at Fort Huachuca.

JIFX events are designed to be multi-institutional, semi-structured learning environments for both innovators and observers. This environment enhances collaboration and increases innovation in a pre-acquisition setting.





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	Title	Organization
A-02	Phalanx Shield Multi-Domain	Innovative Algorithms
A-03	AZ Flyer	University of Arizona
A-04	Multi-Agent UAS Teaming for Extended ISTAR and Autonomous Resupply	University of Nebraska-Lincoln
A-08	Autonomous Logistics and Reconnaissance in GPS Denied Environments	Rhoman Aerospace
A-10	Visual Positioning for Autonomous Missions in Degraded/Denied PNT Areas	Vermeer
B-01	DROPs Drone Agnostic Cargo PODs	TB2 Aerospace
B-03	Drone Amplified Block 1.5 Medium Lift Delivery Platform Flyoff	Drone Amplified
B-05	USV Performance Evaluation with AIRMADE Fuel	Air Company
B-07	Weather Hive: Automated wind and Meteorological Sensing for Atmospheric Modeling and Situational Awareness	GreenSight
D-01	Whisper - Secure Wireless WiGig Intra-Boat Communication	Asymmetric Technologies



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	Title	Organization
D-02	Data Strategy for Unmanned Systems	Naval Postgraduate School (NPS)
E-01	Technologies for AI-enabled Logistics in Contested Environments	IoT/AI
F-02	AIPED	Phelps2020 Inc.
F-03	Multi-Domain Expeditionary Artificial Intelligence and Behavior Analysis at-the-edge for Tactical Surveillance Application	Gantz-Mountain Intelligence Automation Systems, Inc.
G-05	ATAK Live Mapping	GreenSight
G-07	Data Driven Contested Logistics Analytical Modeling	Premise Data
I-01	Wearable Brain Health Monitoring	neuroFit
J-01	Foreign Object Debris Detection & Retrieval	DropDrone
L-01	Aerial Logistics	Toofon, Inc.
M-01	Dismounted Inertial Navigation	Yotta Navigation



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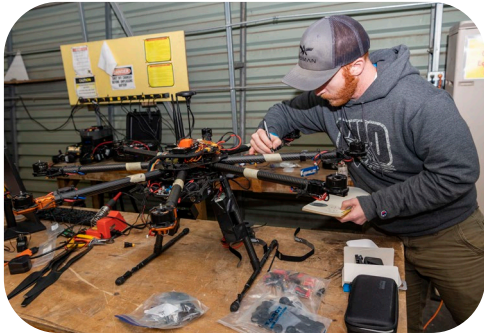
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A-08: Autonomous Logistics and Reconnaissance in GPS Denied Environments, **Rhoman Aerospace**



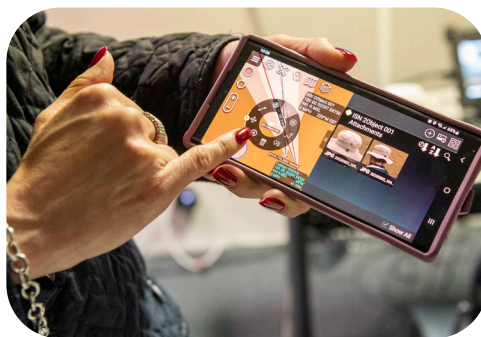
A-02: Phalanx Shield Multi-Domain, **Innovative Algorithms**



A-04: Multi-Agent UAS Teaming for Extended ISTAR and Autonomous Resupply, **University of Nebraska Lincoln**



I-01: Wearable Brain Health Monitoring, **NeuroFit**



F-03: Multi-Domain Expeditionary Artificial Intelligence and Behavior Analysis at-the-edge for Tactical Surveillance Application, **Gantz-Mountain Intelligence Automation Systems, Inc**



B-03: Block 1.5 Medium Lift Delivery Platform Flyoff, **Drone Amplified**

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Academic Participants

A-04: Multi-Agent UAS Teaming

The University of Nebraska Nimbus Lab (Nebraska Intelligent Mobile Unmanned Systems) attended JIFX 23-3 to explore applications for UAS swarms. The team evaluated the effectiveness of an autonomous swarm to conduct intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) tasks against static and moving targets as well as execute resupply missions. The highlight of the effort was the successful deployment, control, and recovery of an 8 UAS swarm launched in the air from two transporting UAS.



A-02: AZ Flyer

Researchers from the University of Arizona returned to McMillan Airfield to complete the initial phase of their AZ Flyer experiment. The main goal was to verify the ability of an unmanned glider to harvest energy from wind gradients in high-altitude jet streams via dynamic soaring profiles to enable prolonged flight. The researchers validated their hypothesis and exceeded their projections for sustaining flight in a series of flights using a 12ft wingspan off-the-shelf glider.

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B-05: USV Performance Evaluation with AIRMADE Fuel

At JIFX 23-3, Air Company captured performance data from measured distances run by NPS SeaFox USV research platforms. One set of laps powered by conventional Jet-A fuel derived from fossil fuels and the other set fueled by Air Company’s alternative Jet-A fuel produced from carbon dioxide and water. Air Company developed technology that produces fuel on-site using carbon dioxide capture from the air or the water as part of the Defense Innovation Unit’s (DIU) Project Synthetic Fuels for the Contested Environment (Project SynCE). The fuel was produced in a pilot plant in Brooklyn, New York, then transported to the west coast for use in the USVs near Camp Roberts. Preliminary analysis of data collected suggests the AIRMADE fuel outperformed the fossil-based fuel while also discovering additional features such as altering the visual signature of the vessel by decreasing engine exhaust. The successful completion of this experiment appears to have proven the efficacy of the alternative fuel which should allow the team to concentrate on developing methods to scale up fuel production.



Upcoming Events

Event	Dates	Focus Area	Location
JIFX 23-4	7 – 11 August 2023	Autonomy & Human Machine Teaming	NPS Field Laboratory at Camp Roberts

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