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Scalable Adaptive Resilient Autonomy (SARA)

W911NF-20-S-0005

Amendment #4

The purpose of this modification is to issue Cycle 4 of the ARL SARA Program. This modification includes sub-topic updates as well as administrative changes to the FOA. Please be sure to read the modification in its entirety. Proposals are due in grants.gov by 5:00pm (local time in Maryland, USA) on 17 May 2024. An email receipt will be provided to each Applicant for each Proposal submission received. Applications submitted after the closing date and time will not be considered or evaluated by the Government.

Scalable Adaptive Resilient Autonomy (SARA)

Funding Opportunity Overview

1. **Federal Awarding Agency Name**

   Combat Capabilities Development Command (DEVCOM)
   Army Research Laboratory
   2800 Powder Mill Road
   Adelphi, MD 20783-1197

   Issuing Acquisition Office:
   U.S. Army Contracting Command – Aberdeen Proving Ground, Research Triangle Park (RTP) Division, 800 Park Office Drive, Suite #4229, Research Triangle Park, NC 27709

2. **Research Opportunity Title:**
   Scalable Adaptive Resilient Autonomy (SARA)

3. **Announcement Type:**
   Amendment: Cycle 4 Update. See Section **"Cycle 4 Technology Sprint Topic: Resilient Autonomous Maneuver"**

4. **Funding Opportunity Number:**
   W911NF-20-S-0005 (The same FOA number from the first cycle will be used throughout all cycles of the program but will be amended at the beginning of each cycle to reflect current topic area descriptions and other relevant program updates.)

5. **Catalog of Federal Domestic Assistance (CFDA) Number(s):**
   12.630 - "Basic, Applied, and Advanced Research in Science and Engineering"

6. **SARA CRA Website:** https://www.arl.devcom.army.mil/cras/sara-cra/

7. **A) Opportunity Webinar:** See SARA website (above) for meeting links and updated schedule. Will be held online via Teams. Planned for 19 April 2024, 1:00 to 2:00 PM EDT.

   ATTENDEE LINK:

   https://dod.teams.microsoft.us/l/meetup-join/19%3adod%3ameeting_8f009261fb2a45caa5ebee7684e8cba9%40thread.v2/0?context=%7b%22Tid%22%3a%22fae6d70f-954b-4811-92b6-0530d6f84c43%22%2c%22Oid%22%3a%22451beed5-66c8-4cd7-be33-2b415be307f4%22%2c%22IsBroadcastMeeting%22%3atrue%7d

   B) 2ND Opportunity Webinar: See SARA website (above) for meeting links and updated schedule. Will be held online via Teams. Planned for 29 April 2024, 1:00 to 2:00 PM EDT.

   ATTENDEE LINK:

https://dod.teams.microsoft.us/l/meetup-join/19%3adod%3ameeting_03b7b3ac3ba64399a47d660c39969106%40thread.v2/0?context=%7b%22Tid%22%3a%22fae6d70f-954b-4811-92b6-0530d6f84c43%22%2c%22Oid%22%3a%22451beed5-66c8-4cd7-be33-2b415be307f4%22%2c%22IsBroadcastMeeting%22%3atrue%7d

8. **Submission of Questions:** usarmy.apg.devcom-arl.mbx.sara-cra@army.mil

9. **Key Dates:**
The following is a summary of the events and dates associated with this SARA CRA Funding Opportunity Announcement (FOA):

EVENT	ESTIMATED DATE/TIMEFRAME
Opportunity released	11 April 2024
Opportunity Webinar	19 April 2024
2nd Opportunity Webinar	29 April 2024
Deadline for Questions on Funding Opportunity	03 May 2024
Proposals Due for Cycle 4	17 May 2024 5:00pm (local time in Maryland, USA)
Notification to Recipients	15 July 2024
Cycle 4 Awards	1 Nov 2024

Scalable, Adaptive, and Resilient Autonomy (SARA)

A. PROGRAM DESCRIPTION

1. Background

The U.S. Army Combat Capabilities Development Command (DEVCOM) Army Research Laboratory (ARL) is focused on developing fundamental understanding and informing the art-of-the-possible for warfighter concepts through research to greatly improve air and ground based autonomous vehicle perception, learning, reasoning, communication, navigation, and physical capabilities to augment and increase the freedom of maneuver in complex and contested environments. The Scalable, Adaptive, and Resilient Autonomy (SARA) program is focused on developing and experimentally accelerating emerging research in autonomous mobility and maneuverability, scalable heterogeneous and collaborative behaviors, and human agent teaming to realize adaptive and resilient Intelligent Systems that can reason about the environment, work in distributed and collaborative heterogeneous teams, and make optempo decisions to enable Autonomous Maneuver in complex and contested environments. In order to achieve this vision, advancements are needed in following:

- Novel methods for all-terrain ground and aerial maneuver to interact with and move through complex environments.
- Methods for scalable and heterogeneous collaborative behaviors in support of collaborative air and ground manned-unmanned teaming operations.
- Techniques for improved perception, decision-making, and adaptive behaviors for fully autonomous maneuver in contested environments.

- Methods, metrics, and tools to facilitate, simulate, and enable testing and evaluation of emerging approaches for intelligent and autonomous systems under Army relevant constraints and environments.
- Experimental testbeds to develop and refine knowledge products to inform and transition technology to Army stakeholders.

2. Cycle Structure

The SARA program consists of a series of technology sprint efforts executed in annual program cycles. Each topic will focus on addressing a different scientific area within the scope of the broad research aims of SARA. Each topic will be carefully chosen based on both program achievements from the previous year, on scientific and technological advancements by the broader research community, and in a way to systematically converge on the specific long-term SARA program goals.

Specific components of the program are highlighted below:

- The FOA will be amended annually to identify a specific problem statement, topic, and other necessary changes for that specific Cycle.
- Each annual Cycle will begin with a call for "seedling" proposals with funding provided to those Recipients selected under a cooperative agreement (CA).
- The Recipients of a seedling CA under the annual Cycle are eligible for consideration to receive funding for an optional extension of up to 3 years, in up to 1-year increments, at the conclusion of the seedling Award.
- Total number of seedling Recipients and funding per Recipient may vary from year to year at the discretion of the Government based on annual Cycle changes or requirements.
- Each Cycle topic will be focused on addressing a different scientific area within the scope of the broad research aims of SARA, with all Cycles designed to ultimately converge on the specific long-term program goal noted above.
- Cycle topics will be carefully chosen based on both program achievements from the previous year and on scientific advancements by the broader research community.
- Enhanced Research Program funding from ARL or Other Government Agencies (OGAs) may become available during a cycle which provides a mechanism for growth and enhancement within the SARA program. A proposal should not include any discussion of the Enhanced Research Program. Recipients receiving a CA will be notified and provided details if the opportunity for Enhanced Research Program funding becomes available during their award period of performance.
- There is no limitation on the place of performance, although on-site collaboration at ARL facilities and with ARL researchers as well as with other Recipients is strongly encouraged. Research outcomes in this program must, at the very least, be demonstrated in situated experimentation events in relevant environments on surrogate research testbed platforms. For SARA Cycle 4, the events are expected to take place at the Robotics Research Collaboration

Campus (R2C2) at Graces Quarters, Aberdeen Proving Ground, Maryland.

- Seedling Recipients will be required to participate in a kickoff meeting within the first month of the start of the program. Relevant internal research program materials and contact information will be provided to Recipients during introductory presentations to help facilitate identification of collaboration between Recipients and individual ARL researchers or internal research programs.

- Recipients will be furnished with access to the ARL Air and Ground Autonomy Stack software suites as well as all relevant simulation tools, for the duration of the award period of performance. Recipients are expected to develop and integrate code into the ARL Autonomy Stack(s) throughout the program, with emphasis on this integration placed in the days and weeks leading up to experimentation events on site at ARL facilities.

3. Deliverables / Research Products

Given the cyclical and collaborative nature of SARA, awardees are encouraged to share research products (e.g., algorithms/code, data, bag files) whenever possible with ARL and fellow awardees in order to contribute to the collective S&T advancement of the program and the autonomous mobility research community and ecosystem. Creative ideas to enable enduring and multiplicative benefits (e.g., government and commercial) of the research conducted under SARA is highly encouraged. Additionally, the intent is to leverage past work to promote greater return on investment (ROI) for government investments under each award.

a) Required Seedling deliverables:
- At kickoff meeting: Seedling Research Summary/Plan (publicly releasable, ½ page target)
- 2 weeks after kickoff meeting: 2-slide overview with first slide including Title, Principal Investigator Names, Objective, ARL Autonomy Stack Context, Approach, and Key Advancements, and supporting graphics; and second slide including a graphical depiction of where contributions will be made to the ARL Autonomy Stack as Replace, Modify, or Create New (publicly releasable) – template will be provided
- End of seedling award: Final Seedling Research Report (publicly releasable, 10 pages max)

b) Required Option deliverables:
- 2 weeks post modification notification: 2-slide overview in same format as Seedling deliverable (public releasable) – template will be provided
- 1 month post modification notification: Proposed Research Summary/Abstract (publicly releasable, ½ page target)
- Annually for extension period of performance: Annual Research Report (publicly releasable, 10 pages max)

c) Additional project-specific deliverable examples are below and will be determined at award time:
- Algorithms developed/used
- Annotated datasets
- Testbed description
- Multimedia (photos and videos)
- Any other relevant research product

4. Cycle 4: Resilient Autonomous Maneuver

SARA Sprint Cycle 1 (Off-road Autonomous Maneuver) focused on fast planning under uncertainty and risk. SARA Sprint Cycle 2 (Autonomous Complex Terrain Maneuver) focused on dense vegetation and complex forested terrain. SARA Sprint Cycle 3 (Long-Duration Autonomous Maneuver) focused on overcoming challenges presented by large separation distances. Sprint Cycle 4 is focused on applied research solutions to enable resilient autonomous maneuver – out of scope for this FOA are basic and foundational research, as well as materiel solutions such as radios and waveforms.

For Sprint Cycle 4, ARL is interested in Robotic Autonomous Systems (RAS) that will have the ability to sustain mission performance despite degradation in communications or having to transition across varied terrains. Urban settings are one possible operational domain. Off-road environments are more relevant, including unstructured scenarios with natural obstacles such as forests, jungles, deserts, dense foliage, and undulating terrain with watershed features including wet gaps and dry gaps. Rural settings are also relevant, with boundary fences, walls, and sparse structures. In each of these domains, the RAS must successfully complete the maneuver and mobility objectives with limited previous knowledge of the environment, human interventions, or external supporting infrastructure. In order to demonstrate the necessary robustness to unknowns and resiliency in complex environments, significant advancements in algorithms for autonomous navigation perception, estimation, planning, and control will be required.

Overall Assumptions for Cycle 4, which apply to all Sub-Topics:

i. GPS limited/denied navigation; GPS is not available or is only intermittently available, which requires drift-free mapping
ii. Unprepared terrain, defined primarily by forest environment
iii. Point A to B navigation over distances on the order of kilometers with potential for area/zone search at point B
iv. Ability to operate with and without a stale map a priori
v. Not reliant on communication/data feeds to complete a commanded task

Program-Level Metrics:

Recipients will be required to integrate their solutions into the ARL Autonomy Stack(s) for experimentation events at ARL facilities, on ARL testbeds. At these events, Recipients and ARL researchers will conduct situated experiments relevant to each Sub-Topic. Component-level performance will be evaluated using the metrics defined in each Sub-Topic. System-level performance will be evaluated using metrics such as:

i. Number and duration of human interactions needed to complete task
ii. Mean Distance Between Interactions
iii. Mean Time Between Interactions

iv. Speed to complete navigation task compared to a single tele-operated ground RAS
v. Complexity of terrain traversed based on number, density, and type of obstacles

An applicant may propose additional or alternative metrics to enable performance evaluation of technologies developed during Sprint 4. Proposed component and system metrics must be relevant and observable, and the proposal should include justification for their necessity and sufficiency.

Sub-Topic #1: Collaborative Behaviors in Comms-denied Areas

Overview: As autonomous systems operate over greater scales, in complex terrain, and out of sight of human operators, there is increased likelihood of experiencing intermittent communications (e.g., messages, telemetry) with command & control (i.e., humans sending goals and commands to robots) and with other autonomous systems. Despite these potential interruptions, the autonomous systems must fulfill their mission objectives.

This Sub-Topic will focus on enabling autonomous systems to perform through adversity using approaches such as re-balancing objectives, adaptation, and recommending alternative approaches to human operators.

Consider this example scenario: The team has received commands and goals (i.e., objective A). Robots are performing autonomous maneuver when they suddenly experience intermittent comms or dropout. How do the robots reorganize to accomplish the objective(s)? How is success measured upon reorganization created? How do they prioritize sub-objectives to achieve mission success?

Focus: Algorithms that enable team performance when experiencing intermittent communications or dropout.

Objective: Develop techniques for enabling autonomous platforms to continuously localize, map, plan, and collaborate when communications are lost. Agents react to comms loss to complete the objectives without human intervention.

Topics of interest include:

- Dynamic mission planning or replanning (real time flexible adaptation to changes in agents, environments, and conditions)
- Resilient mission planning that can leverage task and purpose to achieve independent task adaptation
- Approaches that enable the agents to continue performing the mission (i.e., robustness) when they are no longer able to communicate
- Multi-agent task allocation
- Approaches that passively (i.e., continue pursuing mission objectives) or actively (i.e., change behaviors or recommend alternate sub-objectives) manage behaviors under intermittent comms

This Sub-Topic includes the following unique assumptions:

- At least two agents must collaborate; at least one mobile robotic autonomous system with ability to interact with others, but not all agents in the scene need to be mobile robotic autonomous systems
- Autonomous systems receive a baseline mission including objectives and measures
- Systems do not require line of sight with one another and are expected to continue contributing to scenario objectives in the presence of reduction in comms

Metrics:

- Success rate (per unit time or per unit distance) versus same mission with no reduction in comms
- Time to complete mission versus same mission with no reduction in comms
- Area covered in mission versus same mission with no reduction in comms
- Percent of mission completion and reasons for incompletion
- Number of interventions and reasons for intervention

Guiding Questions:

The following are not intended to suggest approaches or solutions. They are provided to help applicants think through situations that arise from intermittent and denied communications.

- Where is the mission taking place?
- How will you recreate this scene at the ARL Graces Quarters facility and at your own facilities?
- What are the initial conditions of agents in the scene? How will you define this and share it with humans and other agents?
- How does the system react when one agent gets an update and others do not – which command wins? How does the update get from that one agent to all other agents?
- How do the agents know if they are working in a comms-denied area? How do agents know when comms have returned?
- How do / should the agents change their behavior upon entering a comms-denied state? Continue on last command? Suggest new commands?
- When and how to recognize that agents are in a degraded state, and what happens then?
- Can the agents predict a likelihood of comms going down and/or coming back up?
- How will agents reconcile upon comms returning? How do they handle all the data from all the sensors on all the robots coming in at once? How do they prioritize what data to accept first?

Sub-Topic #2: Autonomous Maneuver in Extreme Terrain and Transitions

Overview: Robotic systems, such as quadrupeds, are being developed in support of Infantry Platoons to 1) extend their reach with robotic assets engaging a threat at the front line with human counterparts at a safe distance, and 2) assist the dismounted Soldier in unstructured environments. These unique unstructured environments are areas that Soldiers must traverse, but prove challenging for wheeled, tracked, or aerial systems due to dense foliage. Advancing autonomy of quadrupedal robots will support a platoon's mobility, protection, situational awareness (SA), endurance, and persistence, ultimately enabling faster observation, orientation, decision-making, and action (OODA loop).

Objective: The objective of this Sub-Topic is to enable a legged platform to autonomously maneuver over multiple complex, unstructured terrain types by considering the expanded capabilities of a legged platform beyond similarly sized wheeled and tracked platforms (e.g., climbing/leaping over a log vs. driving around it).

Focus: The focus of this work should be on developing novel algorithms and technologies for advanced maneuver across more than one terrain type (e.g., tall grass, rocky inclines, rubble, indoor clutter, water, subterranean), with communication through a graphical user interface such as ROS Visualization (RVIZ)

Topics of interest include:

- Inform a single agent multi-modal locomotion planner to traverse multiple terrains.
    - Perception and/or Semantic Segmentation algorithms for robust sensing that facilitate maneuver across multiple terrains (e.g., soft soil, rocky terrain, vegetated terrain, ice, snow, rubble, debris, etc.) and/or transition between terrains in multiple weather and lighting conditions (rain, active snow, direct sun, cloudy, night, etc.)
    - Improve identification of soil properties (e.g., stiffness, damping, plasticity, heterogeneity, porosity, etc.) through terrain sensing, proprioception, or a combination to inform a change in robot posture, speed, and/or gait.
    - Motion planning and control methods (e.g., Reinforcement Learning) to intelligently adapt robot posture, speed, gait to adjust for multiple terrain types.

This Sub-Topic includes the following unique assumptions:

- Single agent quadrupedal system
- Autonomy may not be supported by external computational resources
- No human assisted autonomy
- It is essential to account for at least three types of terrain (e.g. tall grass, mud, snow, loose sand, wet sand, rubble, etc.) that pose challenges for a wheeled/tracked platform of similar size. Similar size refers to vehicles with comparable mass and wheelbase.
- Autonomously switch between terrains

- **Metrics:**
- Multi-modal Autonomy/Algorithm behaviors
    - Training time
    - Quantified data needed for training (e.g., bytes of data, number of examples, demonstrations, iterations)
    - Quantified time/effort associated with curating/labeling data.
    - Execution error rate (e.g., failure rate, deviation distance)
    - Execution time/duration (i.e., how fast the algorithm/approach executes a task)
    - Number of human interventions as a function of environmental complexity (i.e., task difficulty)
    - Percentage of successful terrain switches.
    - Slopes that challenge the mobility of similar sized wheeled and tracked platforms.
- Perception/Semantic Segmentation/Mapping
    - % Accuracy of categorizing the environment
    - Localization accuracy of the robot within the environment (e.g., increase legged robot odometry accuracy)
    - (If perception can affect maneuver) Level of terrain complexity able to traverse, (e.g., density and height of grass, slickness of ground (ice vs. no ice), roughness of terrain (e.g., size and wavelength of rocks in terrain)
    - Percentage of room/area successfully mapped.
    - % Accuracy of areas of interest.
    - Number of terrains identified over baseline.

5. Government furnished equipment (GFE) and software

To allow for diverse and unexpected proposals, the use of the following GFE is optional but may enable better integration with ARL research programs for system experimentation and demonstration.

The baseline ARL Autonomy Stacks will be made available to seedling Recipients as GFE at Award for development purposes. Awards will contain terms and conditions for receipt of this GFE. Recipients may use their own autonomy stacks and RAS testbeds during performance of the SARA program, but capabilities developed or modified are expected to be integrated into the ARL Autonomy Stack(s) and onto ARL RAS testbeds in support of collaborative experimentation. Proposals will describe a plan for and ability to integrate hardware and algorithm solutions into ARL architectures and testbeds and will be evaluated on this plan as part of the collaboration and experimentation factor.

ARL Ground Autonomy Architecture

The autonomy architecture is based on packages and components implemented with the Robotic Operating System (ROS) to enable reproducibility and modularity. Reproducibility derives from package meta-data (ROS package.xml) and build system (catkin-tools). We consider modularity at two scales: both individual algorithms/nodes and clusters of nodes that provide capability. The architecture depends on the TF library and adheres to the ROS Enhancement Protocol. Central to the world model and representations of the architecture is the adoption of pose-graph-based solutions to the simultaneous localization and mapping (SLAM) problem for GPS-denied or degraded localization. That is, representations of the world consume a list of frame correction (e.g., map to odometry) in order to process observations in a consistent frame (e.g.,

map). Finally, we assume a federated world model; the location and communication of data is in the hands of the system designer.

Contributions to the existing architecture come in three possible ways:

- Replace an existing algorithm or capability with a newly-developed or already-existing one. Experiments should then be conducted to show improved performance.
- Add an algorithm or capability, either already-existing or newly-developed. Experiments should then be conducted to show augmented capability.
- Modify an existing algorithm or capability. Experiments should then be conducted to show improved performance.

ARL Ground Autonomy Stack

The existing ARL Autonomy Stack provides an implementation of the architecture described above and will be provided as GFE to seedling Recipients. It consists of four major capabilities as described below and shown in Figure 1:

- Perception pipeline: Take sensor data, e.g., RGB images and point clouds, and process to symbolic observations. Components include object detection, per-pixel image classification, object position/pose estimation based on LIDAR, etc.

- Simultaneous Localization and Mapping (SLAM): Using sensor data and perception pipeline products, formulate SLAM problem as a pose-graph optimization and solve. Includes components for point cloud alignment (ICP), pose-graph optimization (GTSAM), caching/data-association/fusion of symbolic object measurements, renderers of terrain classes/occupancy grids/point clouds.

- Metric Planning and Execution: Use metric model of the world to achieve metric goals, e.g., waypoint navigation. Includes components for global planning (e.g., lattice-based motion planning), local planning (e.g., trajectory optimization), and an executor to sequence planning and control.

- Symbolic Planning: Use symbolic model of the world to achieve symbolic goals, e.g., going near a particular object. Underlying symbolic planning architecture is based on behavior trees. Includes components for mission planning (e.g., the Planning and Acting using Behavior Trees), mission execution, sample behaviors that interface with mission planning/execution and the metric planning/execution layer (e.g., going to an object).

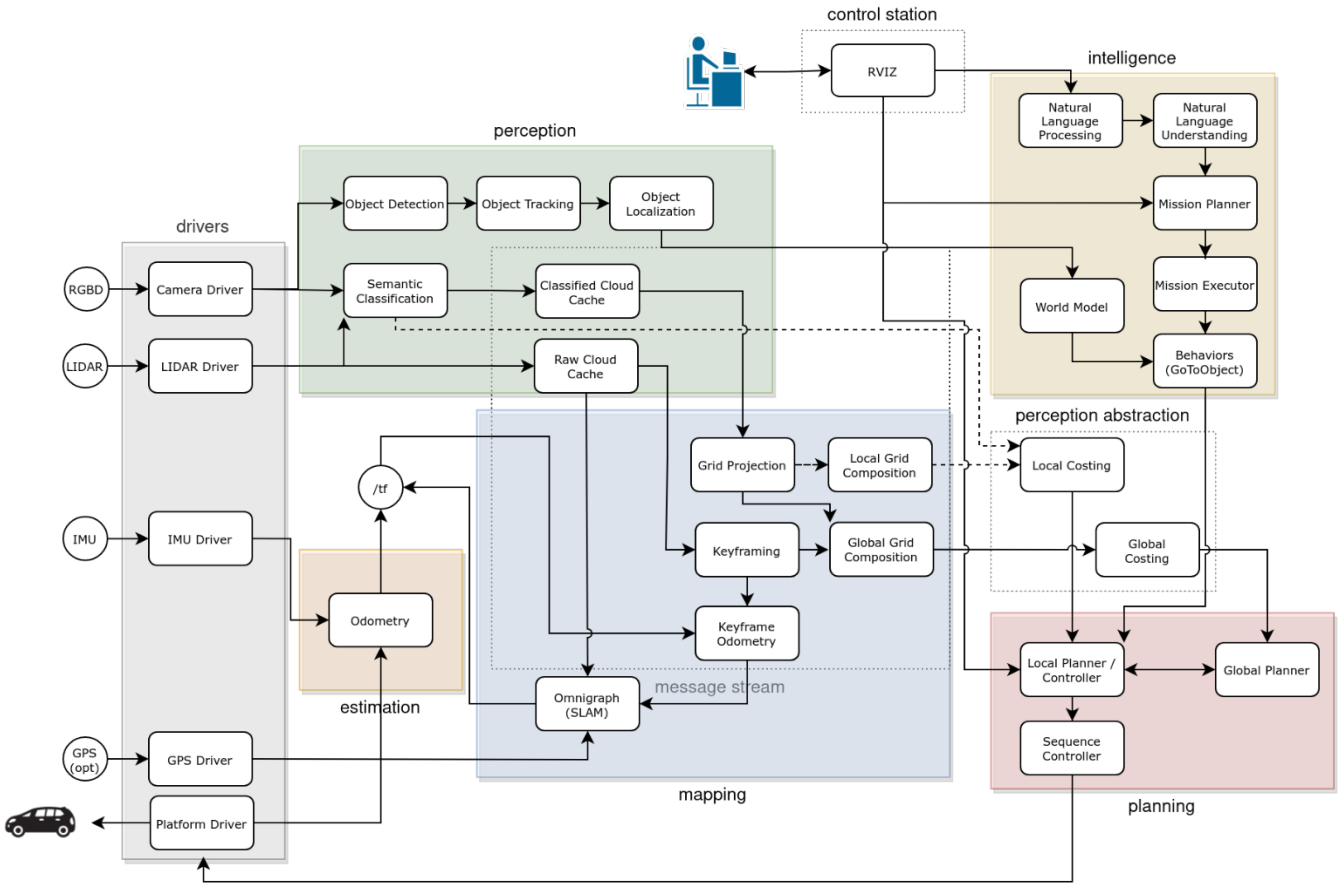

Figure 1. ARL Ground Autonomy Stack

ARL Air Autonomy Architecture

ARL's air autonomy architecture is known as "MAVericks" and leverages the ROS2 ecosystem. It strives to be consistent with ROS architecture conventions such as the use of standard message types, transform trees, vehicle definition files, etc. It leverages the open source PX4 flight control software to perform low level control and state estimation. A particular focus of the architecture has been in a modular behavior tree-based navigation stack, as well as being designed for multi-agent teaming from the ground up. This includes removing any constraints of the ROS1 "master-slave" paradigm as well as the ability of explicitly defining data shared between agents and the quality of services rules to improve reliability. MAVericks is designed to also act as a multi-agent bridge for ROS1 based autonomy architectures.

Like with the ground autonomy architecture, contributions to the existing architecture come in three possible ways:

- Replace an existing algorithm or capability with a newly-developed or already-existing one. Experiments should then be conducted to show improved performance.
- Add an algorithm or capability, either already-existing or newly-developed. Experiments should then be conducted to show augmented capability.
- Modify an existing algorithm or capability. Experiments should then be conducted to show improved performance.

ARL Air Autonomy Stack

The existing ARL Air Autonomy Stack provides an implementation of the architecture described above and will be provided as GFE to seedling Recipients. It consists of these major capabilities and is shown in Figure 2:

- Leverages PX4 and ROS2: PX4 used for state estimation, position/attitude control, sensor interface. ROS2 for higher level decision making and visual processing. ROS has direct access to internal flight control data.
- Multi-agent teaming.
    - No longer constrained by ROS1 master-slave architecture
    - Data transmission can be tuned using Quality of Service (QoS) rules
    - Can act as a multi-agent bridge for ROS1 based ground vehicles including translating messages from ROS1 to ROS2, and localizing the height of a ground vehicle based on an existing terrain map.
- Behavior tree-based actions (e.g. go to, takeoff, land):
    - Modular plug-in navigation architecture. Planners and controllers can be easily swapped.
    - Easy to expand and build complicated behaviors. Behavior trees can build off of existing behavior trees to achieve increasingly complex behavior.
    - Uses built-in ROS2 transform tree to link coordinate frames
- Onboard target detection and localization.
    - Uses lightweight model inferencing like Mobilenet and Yolov5 to hardware accelerate detection algorithms on low size, weight, and power (SWaP) constrained systems.
    - Targets are localized using known vehicle position and camera parameters.
    - A target disambiguation system that attempts to fuse detections from multiple vehicles into a consistent list of detected objects across all connected vehicles.
- Simulation
    - High visual fidelity Unity game engine simulation environment
    - Vehicle definitions are consistent between sim and experiment
- Safety
    - Verified RC loss failsafe
    - GPS based geo-fencing
    - Multiple failsafe options include disable motors, land in place, return home, etc
    - Can use QGroundControl as a vehicle safety interface for defining failsafe rules and geofences

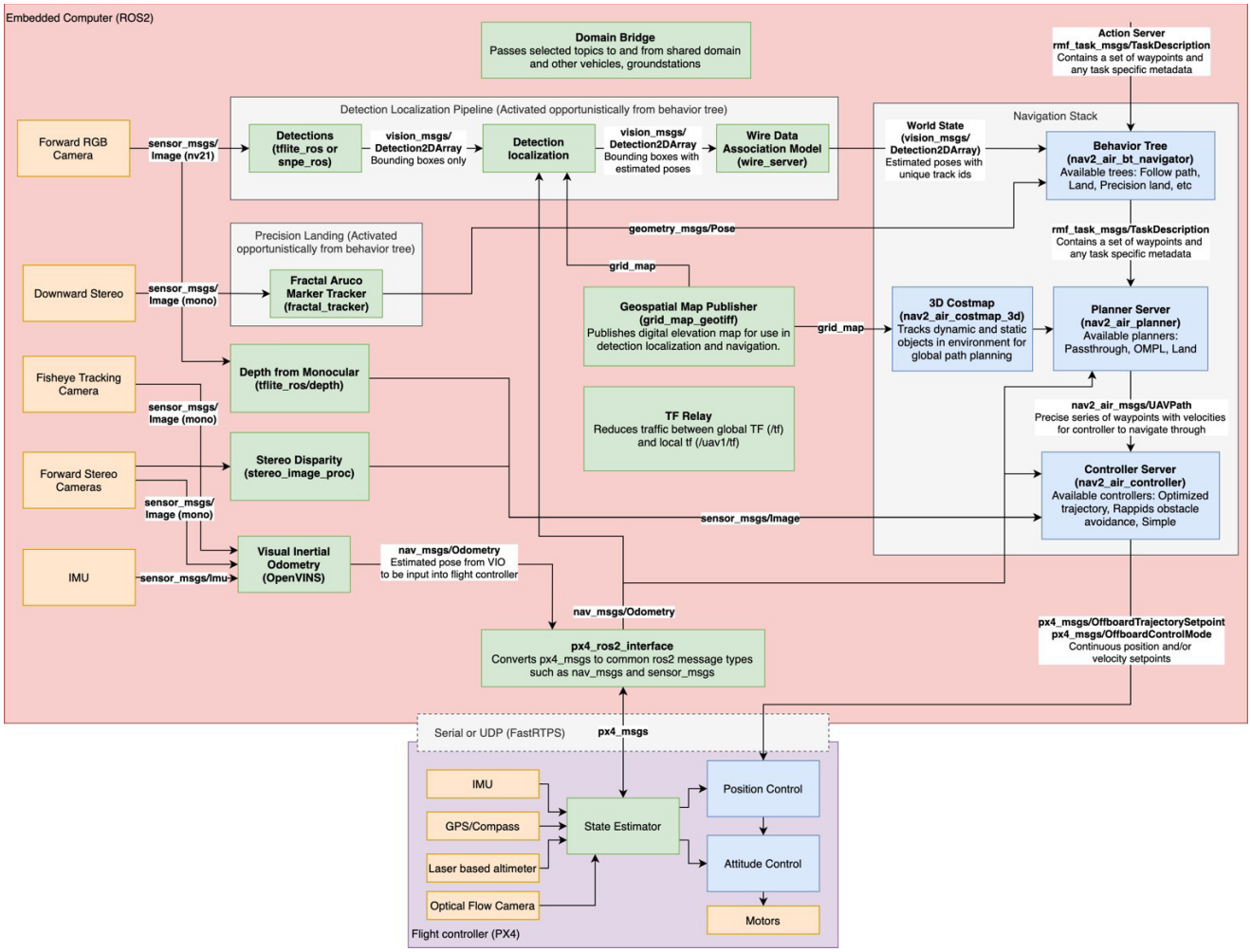

Figure 2. ARL Air Autonomy Stack

ARL Testbeds

Hardware

Development will be done by Recipients on their local RAS testbeds, but experimentation events will be performed using ARL-provided platforms and with autonomy solutions integrated into the ARL Autonomy Stack(s) as defined above.

It is reasonable for Applicants to ask for ARL to undertake specific hardware and software integration tasks as part of the anticipated collaboration, but these requirements must be clearly stated so that ARL can balance them against available resources during the evaluation process. ARL has full configuration control over its own autonomy hardware kits but does not have access to low-level controllers and actuators on the base air and ground vehicle platforms, for example wheel and propeller motor controllers.

Applicants may suggest modifications (i.e., additions, changes) to the ARL UGV and UAS autonomy hardware kits but material, equipment, and integration costs must be factored into the proposal budget. Applicants may include hardware (e.g., sensors, compute, robots) in their proposals, for example to perform local integration and assessment at their own facilities. Title to permanent equipment will be in accordance with the applicable regulations. Suggested modifications and hardware included as part of

proposals will be evaluated under evaluation factor #4, which considers cost realism, cost reasonableness, and affordability within funding constraints. See Cost Component section, of the Proposal Preparation and Submission section, later in this FOA.

ARL has integrated its Ground Autonomy Stack onto the Clearpath Robotics Warthog platform as the primary ground testbed for Cycle 4, Sub-Topic #1 experimentation. The ARL Warthog is approximately 2 m^3 with a maximum speed of 5 m/s, and is equipped with the following baseline computation and sensor payload (subject to change):

i. Two (2) Intel i7 computers with minimum 32GB RAM, 1TB of onboard SSD storage, 1TB of additional storage, and NVIDIA T4 GPU w/ minimum 16GB RAM
ii. Carnegie Robotics S27 MultiSense
iii. LiDAR: Ouster OS1-128
iv. IMU: LORD Microstrain 3DM-GX5-25
v. GPS: u-Blox EVK-M8T
vi. RGBD Camera: Intel RealSense D435i
vii. Two (2) High Resolution Cameras: FLIR Blackfly S, BFS-PGE-16S2C-CS
viii. Two (2) camera lenses: Fujinon DF6HA-1S
ix. Hardware Time Synchronization: Masterclock GMR1000 providing PTP server to LiDAR and cameras, PPS signal to IMU

Cycle 4, Sub-topic #2 performers will work closely with ARL researchers to integrate their solutions with ARL's Ground Autonomy Stack, which is customized for the Ghost Robotics Vision 60 and the Boston Dynamics Spot platforms. These platforms are equipped with the following baseline computation and sensor payload:

i. Out of the box. <Vision 60>
    a. Compute: NVIDIA Xavier
    b. Cameras:
        i. Forward facing stereo camera pair
        ii. Rear Camera
        iii. Left and right cameras
        iv. Forward and rear depth sensors
    c. Internal IMU
    d. WiFi
    e. GPS
ii. Out of the box. <Spot>
    a. Compute: N/A
    b. Cameras:
        i. Two front cameras with depth sensors
        ii. Left and Right cameras w/ depth sensors
        iii. Rear facing camera with depth sensor
    c. WiFi
iii. ARL add-ons. <Vision 60 & Spot>
    a. Compute: TBD
    b. Lidar: Ouster OS0-64 or similar
    c. Camera: Realsense d455 camera and depth sensor
    d. IMU: Microstrain 3DM-GX5-25 or similar

It is not a requirement to match these UGV configurations one-for-one; the Recipient is free to conduct development on a surrogate platform. Upon receipt of Award, specifications of the listed hardware can be made available to Recipients upon request, should the Recipient want to closely match the ARL ground vehicle testbeds.

The ARL air platform (Grazer A) is composed of:

i. Pixhawk based quadrotor vehicle
ii. 2.5 kg approximate weight
iii. Modal AI VOXL 2 onboard computer
iv. Cameras: Forward facing 4K RGB camera, forward stereo, downward stereo
v. Downward facing rangefinder
vi. Available gimbaled camera
vii. Doodle Helix mesh radio

The Grazer A platform is available for purchase and conforms to National Defense Authorization Act (NDAA) 2020 requirements for DoD UAS. As with the ground platform, awardees are not required to use the ARL air platform, but all algorithms developed or modified during performance of the SARA program must be compatible with the Grazer A components.

Flying a UAS at ARL facilities requires close coordination between the Recipient and ARL, to ensure hardware, software, and the pilot meet the necessary requirements and certifications.

Simulation

ARL's simulation environment utilizes the Unity game engine using a custom interface to pass data between ROS and the simulation engine. This simulator works as a "software in the loop (SITL)" in that it simulates sensors and actuators, with the autonomy stack interfacing in the same way as it would on a physical robot. It utilizes a rigid body physics simulation for basic dynamics and collision modeling.

The simulation environment includes representation of the Warthog platform with ARL sensor payloads and autonomy stack. Implemented sensors include cameras, LiDARs, IMUs and wheel encoders; actuators include wheels and motors.

ARL Facilities

The Robotics Research Collaboration Campus (R2C2) at Graces Quarters is a state-of-the-art robotics research facility consisting of approximately 500 acres of natural terrain, existing Administrative and Support Facilities, and a 600-foot diameter gravel pad harboring a Military Operations in Urban Terrain (MOUT) site.

Infrastructure at this site has been tailored to support multi-domain, virtual and live experimentation, with relevant features such as transitions between natural and simulated urban environments. Existing facilities and infrastructure facilitate the full life cycle of robotics research for the laboratory. The Support Facility includes maintenance, tooling, fabrication, and electronics work areas for developing and maintaining platform readiness and employing mission-specific functionality. It also hosts laboratory workspace and a high bay area with full motion capture system. The Administration Building provides ample collaboration space, video conferencing tools, offices, and individual workspaces for both permanent and temporary employees. It also houses considerable networking and compute resources, as well as command and control audio visual interfaces for remote operations.

The site includes a mix of mature and developing forested terrain, fields, varying topographic features and various other unstructured natural elements that provide targeted complexity for both air and ground autonomous systems. From an operational perspective, R2C2 is a collaborative research destination providing partners and ARL researchers access to state-of-the-art facilities, equipment, experimental testbeds, IT resources, and professional engineering and integration support. R2C2 is a critical asset in facilitating joint ventures between ARL and its collaborative research and transition partners.

6. Intellectual Property

For solutions developed under the course of this program ARL, as the Federal awarding agency, will obtain a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use this software for Federal purposes, and to authorize others to do so in accordance with 2 CFR 200.315(b). Solutions with restrictive Intellectual Property or non-open architecture solutions will also be considered, but the proposal must provide for a pathway to transition to future Army systems and integration and operation.

Recipients will include the following in their software releases:

"This software was created by [RECIPIENT] under Army Research Laboratory (ARL) Cooperative Agreement Number W911NF-20-S-0005. ARL, as the Federal awarding agency, reserves a royalty- free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use this software for Federal purposes, and to authorize others to do so in accordance with 2 CFR 200.315(b)."

In accordance with 2 CFR 200.315(d), ARL, as the Federal awarding agency, has the right to obtain, reproduce, publish, or otherwise use the data produced under a Federal award and authorize others to receive, reproduce, publish, or otherwise use such data for Federal purposes.

7. Proposal Intent

It is the intent of this FOA to solicit the most creative, innovative, and flexible approaches to the ultimate goal of generating and exploiting research to solve pressing research gaps and issues impacting both the military and commercial sectors. This FOA seeks Proposals which will result in the award of multiple CAs. Proposals will be solicited for innovative solutions that will advance the state-of-art and the provided baseline ARL autonomy capability along the sprint topic focus area(s) and enable new novel maneuver or mobility behaviors for autonomous systems. Research from these proposals should result in experiments demonstrating the art-of-the-possible to inform future RAS mobility concepts and augment the ARL RAS code and technology base.

1. For each cycle, funding will be provided to selected Recipients under a cooperative agreement (CA). The Cycle 4 period of performance will be a 12-month seedling effort followed by a possible 3-year option Awarded in up to 1-year increments. The seedling period of performance is expected to begin in early Q1 FY2025 but may be shifted based upon funding availability.

2. Total number of Recipients and funding per Recipient will vary from year to year at the 20discretion of the Government and based on available funding. ARL reserves the right to negotiate with an Applicant to re-scope their proposal technical focus, period of

performance, and associated costs in order to maximize the available program funding, balance of research topics across the program, and overall impact to the program. ARL reserves the right to adjust the balance of research based on merit of proposals received and potential impact to the overall program and advancing the state-of-art.

3. A decision to exercise an option will be made based on a review of the seedling technical and fiscal performance, potential of the proposed optional effort to significantly improve the state-of-art beyond the results of the seedling effort, the relevancy of the technology to the overall SARA program and Army maneuver goals, the ability of the effort to substantially contribute to the ARL autonomy testbed and code base for informing and transitioning to other Army and DoD programs, and the availability of funding and balance of research topics across the program. ARL also reserves the right to negotiate with an Applicant to re-scope their optional proposal technical focus, period of performance, and associated costs in order to maximize the available program funding, balance of research topics across the program, and overall impact to the program.

4. Proposals must address a minimum of one sub-topic but can address more than one sub-topic within this amended special notice.

5. Proposals must address one or more, but need not address all, of the assumptions and challenges listed within each sub-topic within this special notice. If all assumptions are not able to be met, then proposals will outline how not meeting assumptions will impact the proposed solution and approach. Proposals are also not limited to assumptions and challenges listed.

6. The success of this multidisciplinary effort will require meaningful collaborative partnerships between government, academia, and industry to advance the science. Proposals must address the intellectual property (IP) approach, how the approach will foster collaboration with ARL and other SARA Recipients, and how the proposed solution will further advance the state-of-art of open source or ARL/government owned autonomy solutions.

7. The research proposed and performed must comply with the definition for Budget Activities 1-2 research as outlined in the DoD Financial Management Regulation (FMR), Volume 2B, Chapter 5. Budget Activity 1 is for basic research. Budget Activity 2 is for applied research. See DoD 7000.14-R for additional details.

8. All funding is expected to be expended within the cycle period of performance. Available funding will vary from cycle to cycle; for Cycle 4, a total of $2.5M is expected. Additional Enhanced Research Program funding from ARL or Other Government Agencies (OGAs) may become available during a cycle. Multiple awards are expected to be funded out of Cycle 4. Proposals are expected to be bid at a cost commensurate with the level of effort.

8. Collaboration and Experimentation

SARA aims to advance the state-of-art in autonomous vehicle multi-agent tactical maneuver in complex and realistic contested environments. The program has been developed in coordination with

other related ARL-funded collaborative efforts (see descriptions of ARL collaborative alliances at https://www.arl.army.mil/collaborate-with-us/opportunity/collaborative-research-alliance and shares a common vision of highly collaborative academia-industry-government partnerships.

Research results of each cycle are expected to build in a coordinated, collaborative, and cumulative manner to significantly advance the state-of-art in off-road mobility and maneuver. Within a cycle, Recipients are expected to have regular touchpoints with their ARL counterparts. The first touchpoint will be a kickoff meeting where annual program objectives, approach, outcomes, and plans for experimentation will be discussed. Throughout the program bi-weekly collaboration meetings will cover progress towards development and integration of hardware and software solutions in both simulation and on actual testbeds, with more frequent communication leading up to experimentation events. A final review meeting will be conducted at or near the conclusion of each Recipient's period of performance. Recipients are expected to pursue joint research publications and presentations with their ARL counterparts.

Research outcomes in this program must, at the very least, be demonstrated in situated experimentation events in relevant environments on surrogate research testbed platforms. It is encouraged for all Recipients to participate in collaborative experimentation events, with a strong preference for in-person attendance by Recipient team members and ARL researchers. Exceptions will be made on a case-by-case basis (e.g., health, travel restrictions, Citizenship). For SARA Cycle 4, the events are currently expected to take place at the R2C2 Graces Quarters facility, Aberdeen Proving Ground, Maryland. The number of visits that Recipients can make to the ARL R2C2 Graces Quarters facility is only limited by availability of ARL personnel, testbeds, and the facility. Recipients are expected to perform continuous development, integration, experimentation, and learning at their own facility as needed throughout the program. Recipients should plan on at least 2 trips to the ARL R2C2 Graces Quarters Facility during the seedling period of performance.

Experimentation events are expected to nominally last for one week at a time. An objective is for ARL to experimentally assess the impact of each Recipient's contribution to the Stack(s). As such, the Recipient and ARL will document and track relevant metrics at least at the component level, and ideally also at the system level. Leading up to each event, Recipients will commit their algorithms to the ARL Ground and/or Air Autonomy Stacks. ARL will process requests for data collections, transfer of data (i.e., bag files) to the Recipient, and integration of novel sensors onto ARL testbeds, such that Recipients can perform pre-experimentation algorithm verification, validation, and modification. Recipients and ARL will collaborate to closely track the hardware and software configurations of testbed systems during each experimentation event.

B. FEDERAL AWARD INFORMATION

Multiple CAs may be awarded from this FOA. The Applicants selected for award will be notified by the Grants Officer or his/her designee telephonically or via email. The CA award is not official until the Applicant has received the award signed by the Grants Officer.

Cooperative agreements for institutions of higher education, nonprofit organizations, foreign organizations, and foreign public entities are primarily governed by the following:

- Federal statutes
- Federal regulations

- 2 CFR Part 200
- 2 CFR Parts 1104 and 1108
- 32 CFR Parts 21, 22, 26, and 28
- DoD Research and Development General Terms and Conditions
- Agency-specific Research Terms and Conditions

Cooperative agreements for for-profit and nonprofit organizations exempted from Subpart E – Cost Principles of 2 CFR Part 200, are primarily governed by the following:

- Federal statutes
- Federal regulations
- 32 CFR Part 34 – Administrative Requirements for Grants and Agreements with For-Profit Organizations
- 32 CFR Parts 21, 22, 26, and 28
- DoD Research and Development General Terms and Conditions
- Agency-specific Research Terms and Conditions

The following websites may be accessed to obtain an electronic copy of the governing regulations and guidance:

- FAR, DFARS, and AFARS: https://www.acquisition.gov/content/regulations
- Code of Federal Regulations: http://www.ecfr.gov
- DoD Research and Development General Terms and Conditions January 2023: https://www.nre.navy.mil/media/document/dod-research-and-development-rd-general-terms- and-conditions-january-2023
- ACC-APG-RTP Division Assistance, Research General Terms and Conditions dated JANUARY 2022: https://www.arl.army.mil/wp-content/uploads/2022/02/RTP-Agency-Specific-JAN-2022-FINAL.pdf

1. Anticipated Core Funding Cycles

Proposal	FY20	FY21	FY22*	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30**
Cycle 1	B	O		O	O						
Cycle 2		B		O	O	O					
Cycle 3					B	O	O	O			
Cycle 4						B	O	O	O		
Cycle 5						B	O	O	O		
Cycle 6							B	O	O	O	
Cycle 7								B	O	O	O
Cycle 8									B	O	O
Cycle 9										B	O

*No Seedling or Option Awards given in FY22
**Funding not identified beyond FY29

Note: B is for Base ("seedling") period of Cooperative Agreement; O indicates up-to-3-year Option.

2. Award Instrument

This Funding Opportunity is expected to result in the award of multiple seedling cooperative agreements (CAs) during each Cycle as defined at 31 U.S.C. 6305 for the execution of the program. The CA is used to enter into a relationship:

- The principal purpose of which is to transfer a thing of value to the Recipient to carry out a public purpose of support or stimulation authorized by a law or the United States, rather than to acquire property or services for the Federal Government's direct benefit or use.

- Substantial involvement is expected between the Federal Government and the Recipient when carrying out the activity contemplated by the CA.

- No fee or profit is allowed.

3. Structure of Award

The CAs will consist of a proposal structured as a 12-month Base award that will be executed and considered a seedling CA. The Recipients of a "seedling" CA are then eligible for consideration to receive funding for an optional extension of up to 3 years, in up to 1-year increments, at the conclusion of the seedling Award. The period of the performance and funding amount of potential option periods will be based on the goals of the SARA program, merits of the proposed optional research and potential impact to advancing the SARA goals, and available funding.

4. Proposal Submission

The application process consists of proposal submissions from applicants for each Cycle under this FOA. Applicants should note there are page limitations and other requirements associated with the submission process. Submissions in connection with this FOA are due by the date and time specified below. FOA amendments for future topics will include the submission requirements for those submissions. The Government's decision to award a seedling CA will be based upon the evaluation results of the proposal submission.

5. Period of Performance

The CA Awards made as a result of this FOA will provide for a period of performance of one year, with the potential exercise an option period for up to three additional years at the discretion of the Government.

6. Place of Performance

There is no limitation on the place of performance, although on-site collaboration at ARL facilities and with ARL researchers as well as with other Recipients is strongly encouraged. Research outcomes in this program must, at the very least, be demonstrated in situated experimentation events in relevant environments on surrogate research testbed platforms. For SARA Cycle 4, the events are expected to take place at the Robotics Research Collaboration Campus (R2C2) at Graces Quarters, Aberdeen Proving Ground, Maryland.

7. Funding

This FOA is issued subject to the availability of funds. ARL has submitted the requisite documents to request funding for the period covered by the program. However, Applicants are reminded this request is subject to Presidential, Congressional and Departmental approval. Funding levels specified in this FOA are estimated funding levels and are for proposal preparation purposes only; actual funding levels of the CAs will be updated annually as part of the federal appropriation process.

8. Profit/Fee

Profit/fee is not permitted under the CA.

9. Cost Sharing

Cost sharing is not required under this FOA.

10. Opportunity Webinar

ARL will host an opportunity webinar on (see Event timeline above). A link to the webinar will be posted on the SARA Program website at:
https://www.arl.army.mil/cras/sara-cra/

11. Contact Information

Additional information about scheduling and events related to the SARA CRA is available upon request via email to usarmy.apg.devcom-arl.mbx.sara-cra@army.mil. All questions or comments concerning this FOA shall be submitted to usarmy.apg.devcom-arl.mbx.sara-cra@army.mil. Comments or questions submitted should be concise and to the point. In addition, the relevant part and paragraph of the FOA to which a comment or question pertains must be referenced. Responses to non-proprietary questions received will be answered at the SARA opportunity webinar and posted to the SARA program website for the benefit of all interested parties. All clearly identified and marked proprietary questions submitted will be responded to via an individual email response, and not responded to at the opportunity webinar or posted to the SARA program website. Applicants are encouraged to submit questions as early as possible. The deadline for submission of questions which will be answered under this FOA is listed in Event timeline above. Any answers provided to questions do not change the requirements of this FOA. Future amendments to this FOA, including new cycle topics, will be issued via an amended FOA posted in grants.gov.

C. ELIGIBILITY INFORMATION

1. Eligible Applicants

Eligible applicants under this FOA include institutions of higher education, nonprofit organizations, state and local governments, foreign organizations, foreign public entities, and for-profit organizations (i.e. large and small businesses).

2. Cost Sharing or Matching

There is no requirement for cost sharing, matching, or cost participation to be eligible for award under this FOA. Cost sharing and matching is not an evaluation factor used under this FOA.

3. Other

Federally Funded Research and Development Centers (FFRDCs) are subject to applicable direct competition limitations and cannot propose to this solicitation in any capacity unless they meet the following conditions. (1) FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector. (2) FFRDCs must provide a letter, on official letterhead from their sponsoring organization, that (a) cites the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and (b) certifies the FFRDC's compliance with the associated FFRDC sponsor agreement's terms and conditions. These conditions are a requirement for FFRDCs proposing to be awardees or subawardees.

D. APPLICATION AND SUBMISSION INFORMATION

The application process consists of a single Proposal stage. Applicants will receive feedback regarding their proposal **ONLY IF IT IS SELECTED FOR AWARD**, in order to improve the proposal and ensure alignment of the proposed research with Government goals. Applicants with **non-selected proposals will be notified of their non-selection but will not receive feedback**.

1. Address to View the Funding Opportunity Announcement

This FOA may be accessed from the following: Grants.gov (www.grants.gov).

Amendments, if any, to this FOA will be posted to this website when they occur. Interested parties are encouraged to periodically check the website for updates and amendments.

2. Content and Format of Application Submission

The following information is for those wishing to respond to the FOA:

Application Process Overview

Grants.gov Submission

(1) Proposals requesting Assistance agreements must be submitted via Grants.gov.

(2) Grants.gov Registration must be accomplished prior to application submission in Grants.gov.

Each organization that desires to submit applications via Grants.Gov must complete a one-time registration. There are several one-time actions your organization must complete in order to submit applications through Grants.gov (e.g., obtain a Unique Entity Identifier, register with the SAM, register with the credential provider, register with Grants.gov and obtain approval for an authorized organization representative (AOR) to submit applications on behalf of the organization). To register please see http://www.grants.gov/web/grants/applicants/organization-registration.html.

Please note the registration process for an Organization or an Individual can take between three to five business days or as long as four weeks if all steps are not completed in a timely manner.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process should be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

NOTE: All web links referenced in this section are subject to change by Grants.gov and may not be updated here.

(3) Specific forms are required for submission of a proposal. The forms are contained in the Application Package available at http://www.grants.gov under the specific opportunity you are submitting under. When viewing an opportunity, select the "Package" tab and then select "View." A Grant Application Package and Application Instructions are available for this FOA through the Grants.gov Apply portal under CFDA Number 12.630/Funding Opportunity Number W911NF-20-S-0005. To apply, select "Apply" and then "Apply Now Using Workspace."

NOTE: Effective 31 December 2017, applicants must apply online at Grants.gov using the application Workspace. For access to complete instructions on how to apply for opportunities using Workspace refer to https://www.grants.gov/web/grants/applicants/workspace-overview.html.

(4) The SF 424 (R&R) form is to be used as the cover page for all proposals submitted via Grants.gov. Form: The SF 424 (R&R) must be fully completed. Complete this form first to populate data in other forms. Authorized Organization Representative (AOR) usernames and passwords serve as "electronic signatures" when your organization submits applications through Grants.gov. By using the SF 424 (R&R), applicants are providing the certification required by 32 CFR Part 28 regarding lobbying.

How to Register to Apply through Grants.gov

Instructions: Read the instructions below about registering to apply for DoD funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

Organizations must have an active System for Award Management (SAM) registration and Grants.gov account to apply for grants. Creating a Grants.gov account can be completed online in minutes, but SAM registrations may take additional time. Therefore, an organization's registration should be done in sufficient time to ensure it does not impact the entity's ability to meet required application submission deadlines.

Register with SAM: All organizations applying online through Grants.gov must register with the System for Award Management (SAM). Failure to register with SAM will prevent your organization from applying through Grants.gov. SAM registration must be renewed annually. For more detailed instructions for registering with SAM, refer to: https://www.grants.gov/web/grants/applicants/organization-registration/step-2-register-with-sam.html

Create a Grants.gov Account: The next step is to register an account with Grants.gov. Follow the on-screen instructions or refer to the detailed instructions here: https://www.grants.gov/web/grants/applicants/registration.html

Add a Profile to a Grants.gov Account: A profile in Grants.gov corresponds to a single applicant organization the user represents (i.e., an applicant) or an individual applicant. If you work for or consult with multiple organizations and have a profile for each, you may log in to one Grants.gov account to access all of your grant applications. To add an organizational profile to your Grants.gov account, enter the UEI Number for the organization in the UEI field while adding a profile. For more detailed instructions about creating a profile on Grants.gov, refer to: https://www.grants.gov/web/grants/applicants/registration/add-profile.htm

EBiz POC Authorized Profile Roles: After you register with Grants.gov and create an Organization Applicant Profile, the organization applicant's request for Grants.gov roles and access is sent to the EBiz POC. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the Authorized Organization Representative (AOR) role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been assigned the AOR role. For more detailed instructions

about creating a profile on Grants.gov, refer to:
https://www.grants.gov/web/grants/applicants/registration/authorize-roles.html

Track Role Status: To track your role request, refer to:
https://www.grants.gov/web/grants/applicants/registration/track-role-status.html

Electronic Signature: When applications are submitted through Grants.gov, the name of the organization applicant with the AOR role that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC must authorize people who are able to make legally binding commitments on behalf of the organization as a user with the AOR role; this step is often missed, and it is crucial for valid and timely submissions.

How to Submit an Application to DoD via Grants.gov

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different webforms within an application. For each funding opportunity announcement (FOA), you can create individual instances of a workspace. Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to: https://www.grants.gov/web/grants/applicants/workspace-overview.html

Create a Workspace: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.

Complete a Workspace: Add participants to the workspace to work on the application together, complete all the required forms online or by downloading PDF versions, and check for errors before submission. The Workspace progress bar will display the state of your application process as you apply. As you apply using Workspace, you may click the blue question mark icon near the upper-right corner of each page to access context-sensitive help.

Adobe Reader: If you decide not to apply by filling out webforms you can download individual PDF forms in Workspace. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader. NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at:
https://www.grants.gov/web/grants/applicants/adobe-softwarecompatibility.html

Mandatory Fields in Forms: In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.

Complete SF 424 Fields First: The forms are designed to fill in common required fields across other forms, such as the applicant's name, address, and UEI Number. Once it is completed, the information will transfer to the other forms.

Submit a Workspace: An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package **at least 24-48 hours prior to the close date** to provide you with time to correct any potential technical issues that may disrupt the application submission.

Track a Workspace Submission: After successfully submitting a workspace application, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the application. The number will be listed on the Confirmation page that is generated after submission. Using the tracking number, access the Track My Application page under the Applicants tab or the Details tab in the submitted workspace.

For additional training resources, including video tutorials, refer to:
https://www.grants.gov/web/grants/applicants/applicanttraining.html

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1-800-518-4726 and email at support@grants.gov. For questions related to the specific grant opportunity, contact the number listed in the application package of the grant you are applying for.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist the DoD with tracking your issue and understanding background information on the issue.

Application forms and instructions will be available at Grants.gov. To access these materials, go to http://www.grants.gov, select "Apply for Grants", and then select "Download an Application Package." Enter the FOA number, W911NF-20-S-0005.

Applicants must complete the mandatory forms and any optional forms (e.g., SF-LLL Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. The required fields should be completed in accordance with the "pop-up" instructions on the forms. To activate the instructions, turn on the "Help Mode" (icon with the pointer and question mark at the top of the form). Files that are attached to the forms must be in Adobe Portable Document Form (PDF) unless otherwise specified in this announcement. The following formatting rules apply for the file attachments:

- Paper size when printed – 8.5 x 11 inch paper.
- Margins – 1 inch
- Spacing – Single
- Font – No Smaller than Times New Roman, 11 point

Proposal Preparation and Submission

Statement of Disclosure Preference (Form 52 or 52A)

Complete and sign ARO Form 52 (Industrial Contractors) or ARO Form 52A (Educational and Nonprofit Organizations).

Research & Related Other Project Information

Must be completed and signed by all applicants.

Project Summary / Abstract

The Project Summary/Abstract shall include a concise statement of work and basic approaches to be used in the proposed effort. The summary/abstract should include a statement of scientific objectives, methods to be employed, and the significance of the proposed effort to the advancement of scientific knowledge.

The project summary/abstract must not exceed 1 page (4,000 characters) and will not be evaluated as it is primarily for documentation purposes.

The project summary/abstract shall be marked by the applicant as publicly releasable. By submission of the project abstract, the applicant confirms that the abstract is releasable to the public. For a proposal that results in a grant award, the project abstract will be posted to a searchable website available to the general public to meet the requirements of Section 8123 of the DoD Appropriations Act, 2015. The website address is https://dodgrantawards.dtic.mil/grants.

Project Description / Narrative

The technical portion of the proposal shall contain the following.

The Chapters and Numbers of pages field is to contain the chapters set forth below and may not exceed the stipulated page counts for those chapters. Pages in excess of the page limits may be removed for the evaluation of the application. All chapters set forth below should be in a single PDF file. For those chapters with specified page limitations, any pages submitted beyond the specified amount for a chapter will not be reviewed or evaluation.

Chapter 1: Technical Component. The pages included in Chapter 1 are to be numbered. Applicants are advised that Chapter 1 will not exceed 10 pages, utilizing one side of the page using a font no smaller than 11 point. Tables that extend beyond one page (fold out tables) will only count as one page.

Proposed Effort (approximately 5 pages): This section of Chapter 1 should include an overview of the research strategy to be employed to advance the state-of-the-art in enhancing performance in off-road autonomous maneuver; a short description and justification for annual research goals of the proposed effort; and a short technical discussion stating the background and objectives of the proposed research, and the overall technical approaches to be pursued. This technical discussion should include a proposed breakdown of research tasks and short description of the technical approaches for each task. The proposed effort should include the specific hypotheses to be tested, and what specific tasks will be performed by the research team to test them, as well as justification for why these are the appropriate measures.

Proposed Experimentation Participation and Collaboration Development (approximately 2 pages): Include here the plan for scale and scope of proposed experiments as well as a notional or developed plan for involving ARL research personnel and programs and other Recipients. Proposals must address any Intellectual Property and how their approach will foster collaboration with ARL and other Recipients, and how their solutions will further advance the state-of-art of open source or ARL/government owned autonomy solutions in the area of off-road maneuver.

Participant(s) roles, qualifications and bio-sketches (approximately 2 pages): Must include the names, primary role/availability, and brief biographies of Key Personnel. Include plans for junior investigator development and mentorship of less experienced personnel (mentoring plan). A comprehensive biographical sketch will be included as part of the grants.gov submittal and will not count toward the

10-page Technical Component page count.

Proposed timeline (approximately 0.5-1 page): An estimated timeline of tasks to be completed during the 12-month period, including research timelines and planned experimental milestones.

Chapter 2: Technical Component – Option Years. The pages included in Chapter 2 are to be numbered. Applicants are advised that Chapter 2 will not exceed 4 pages, utilizing one side of the page. Tables that extend beyond one page (fold out tables) will only count as one page.

Proposed Effort (approximately 2-4 pages): This section of Chapter 2 should include an overview of the research to extend the methods proposed in Chapter 1 if successful; a short description and justification for annual (up to 3 additional years beyond the seedling year) research goals of the proposed effort; and a short technical discussion stating the background and objectives of the proposed research, and the overall technical approaches to be pursued. The technical discussion should include a proposed breakdown of research tasks and short description of the technical approaches for each task. The Proposed Effort should include the specific hypotheses to be tested, and what specific tasks will be performed by the research team to test them, as well as justification for why these are the appropriate measures.

Chapter 3: Cost Component. The pages included in Chapter 3 will be numbered and Chapter 3 does not have a page limitation. Cost Application must include a budget for the period of performance. The cost portion of the application will contain cost estimates sufficiently detailed for meaningful evaluation, to include potential travel funding for participation in annual reviews as well as in-person interaction with ARL researchers. Budget justification may also be attached in this chapter. Before award it must be established that an approved accounting system and financial management system exist. Proposals should include itemized budgets per the instructions below and must be commensurate with the technical level of effort proposed. For all applications, the budget details should include:

1. Direct Labor: Show the current and projected salary amounts in terms of man-hours, man-months, or annual salary to be charged by the personnel performing under this agreement either by personnel or position. State the number of man-hours used to calculate a man-month or man-year. For each person or position, provide the following information:
    a. The basis for the direct labor hours or percentage of effort (e.g., historical hours or estimates).
    b. The basis for the direct labor rates or salaries. Labor costs should be predicted upon current labor rates or salaries. These rates may be adjusted upward for forecast salary or wage cost-of-living increases that will occur during the agreement period. The cost application should separately identify the rationale applied to base salary/wage for cost-of-living adjustments and merit increases. Each must be fully explained;
        i. The portion of time to be devoted to the requirements of the agreement.
        ii. The total annual salary charged to the agreement; and
        iii. Any details that may affect the salary during the project, such as plans for leave and/or remuneration while on leave.

2. Fringe Benefits and Indirect Costs (Overhead, G&A, and Other): The most recent rates, dates of negotiation, the base(s) and periods to which the rates apply must be disclosed and a statement included identifying whether the proposed rates are provisional or fixed. If the rates have been negotiated by a Government agency, state when and by which agency. A copy of the negotiation

memorandum should be provided. If negotiated forecast rates do not exist, applicants must provide sufficient detail to enable a determination to be made that the costs included in the forecast rate are allocable according to applicable cost provisions. Applicants' disclosure should be sufficient to permit a full understanding of the content of the rate(s) and how it was established. At a minimum, the submission should identify:

a. All individual cost elements included in the forecast rate(s);
b. Basis used to prorate indirect expenses to cost pools, if any;
c. How the rate(s) was calculated;
d. Distribution basis of the developed rate(s);
e. Basis on which the overhead rate is calculated, such as "salaries and wages" or "total costs;" and
f. The period of the applicant's FY.

3. Permanent Equipment: If facilities or equipment are required, a justification why this property should be purchased with Government funds must be submitted. State the organization's inability or unwillingness to furnish the facilities or equipment. Applicants must provide an itemized list of permanent equipment showing the cost for each item. Permanent equipment is any article or tangible nonexpendable property having a useful life of more than one year and an acquisition cost of $5,000 or more per unit. The basis for the cost of each item of permanent equipment included in the budget must be disclosed, such as:
    a. Vendor Quote: Show name of vendor, number of quotes received and justification, if intended award is to other than lowest bidder.
    b. Historical Cost: Identify vendor, date of purchase, and whether or not cost represents lowest bid. Include reason(s) for not soliciting current quotes.
    c. Engineering Estimate: Include rationale for quote and reason for not soliciting current quotes.
    d. If applicable, the following additional information must be disclosed in the applicant's cost application:
        i. Special test equipment to be fabricated by the Recipient for specific requirements in the agreement.
        ii. Standard equipment to be acquired and modified to meet specific requirements, including acquisition and modification costs, listed separately.
        iii. Existing equipment to be modified to meet specific research requirements, including modification costs. Do not include equipment the organization will purchase with its funds if the equipment will be capitalized for Federal income tax purposes. Proposed permanent equipment purchases during the final year of an award must be limited and fully justified.
        iv. Grants and cooperative agreements may convey title to an eligible institution for permanent equipment purchased with project funds. At the discretion of the Contracting/Grants Officer, the agreement may provide for retention of the title by the Government or may impose conditions governing the equipment conveyed to the organization per the governing laws and regulations.

4. Travel: Forecasts of travel expenditures (domestic and foreign) that identify the destination (if known) and the various cost elements (airfare, mileage, per diem rates, etc.) must be submitted. The costs should be in sufficient detail to determine the reasonableness of such costs. Allowance for air travel normally will not exceed the cost of round-trip, economy air accommodations. Specify the type of travel and its relationship to the requirements of the agreement.

5. Participant Support Costs: This budget category refers to costs of transportation, per diem, stipends, and other related costs for participants or trainees (but not employees) in connection with DoD-sponsored conferences, meetings, symposia, training activities, and workshops. Generally, indirect costs are not allowed on participant support costs. The number of participants to be supported should be entered in the parentheses on the budget form. These costs should also be justified in the budget justification page(s) attached to the cost application.
6. Materials, Supplies, and Consumables: A general description and total estimated cost of expendable equipment and supplies are required. The basis for developing the cost estimate (vendor quotes, invoice prices, engineering estimate, purchase order history, etc.) must be included. If possible, provide a material list.
7. Publication, Documentation, and Dissemination: The budget may request funds for the costs of preparing, publishing, or otherwise making available to others the findings and products of the work conducted under an agreement, including costs of reports, reprints, page charges, or other journal costs (except costs for prior or early publication); necessary illustrations, cleanup, documentation, storage, and indexing of data and databases; and development, documentation, and debugging of software.
8. Consultant Costs: Applicants normally are expected to utilize the services of their own staff to the maximum extent possible in managing and performing the project's effort. If the need for consultant services is anticipated, the nature of proposed consultant services should be justified and included in the technical application narrative. The cost application should include the names of consultant(s), primary organizational affiliation, each individual's expertise, daily compensation rate, number of days of expected service, and estimated travel and per diem costs.
9. Computer Services: The cost of computer services, including computer-based retrieval of scientific, technical, and educational information, may be requested. A justification/explanation based on the established computer service rates at the proposing organization should be included. The budget also may request costs, which must be shown to be reasonable, for leasing automatic data processing equipment. The purchase of computers or associated hardware and software should be requested as items of equipment.
10. Subawards (Subcontracts or Subgrants): A precise description of services or materials that are to be awarded by a subaward must be provided. For subawards totaling $10,000 or more, provide the following specific information:
    a. A clear description of the work to be performed;
    b. If known, the identification of the proposed subawardee and an explanation of why and how the subawardee was selected or will be selected;
    c. The identification of the type of award to be used (cost reimbursement, fixed price, etc.);
    d. Whether or not the award will be competitive and, if noncompetitive, rationale to justify the absence of competition; and
    e. A detailed cost summary.

11. ODCs: Itemize and provide the basis for proposed costs for other anticipated direct costs such as communications, transportation, insurance, and rental of equipment other than computer related items. Unusual or expensive items must be fully explained and justified.
12. Profit/ Fee: Profit/fee is not allowed for the Recipient of or subaward to an assistance instrument, where the principal purpose of the activity to be carried out is to stimulate or support a public purpose (i.e., to provide assistance), rather than acquisition (i.e., to acquire goods and services for the direct benefit of the Government). A subaward is an award of financial assistance in the form of money, or property in lieu of money, made under a DoD grant or cooperative agreement by a Recipient to an eligible subrecipient. The term includes financial assistance for substantive

program performance by the Subrecipient of a portion of the program for which the DoD grant or cooperative agreement was made. It does not include the Recipient's procurement of goods and services needed to carry out the program.

Biographical Sketch

1. This section shall contain the biographical sketches for Key Personnel only.
    a. Primary PI: The Primary PI provides a single or initial point of communication between ARL and the awardee organization(s) about scientific matters. If not otherwise designated, the first PI listed will serve as the Primary PI. This individual can be changed with notification to ARL. ARL does not infer any additional scientific stature to this role among collaborating investigators.
    b. Co-PIs: The individual(s) a research organization designates as having an appropriate level of authority and responsibility for the proper conduct of the research and submission of required reports to ARL. When an organization designates more than one PI, it identifies them as individuals who share the authority and responsibility for leading and directing the research, intellectually and logistically. ARL does not infer any distinction among multiple PIs.
2. The following information is required:
    a. Relevant experience and employment history including a description of any prior Federal employment within one year preceding the date of proposal submission.
    b. List of up to five publications most closely related to the proposed project and up to five other significant publications, including those being printed. Patents, copyrights, or software systems developed may be substituted for publications.
    c. List of persons, other than those cited in the publications list, who have collaborated on a project or a book, article, report or paper within the last four years. Include pending publications and submissions. Otherwise, state “None.”
    d. Names of each investigator's own graduate or post-graduate advisors and advisees.

    NOTE: The information provided in (c) and (d) is used to help identify potential conflicts or bias in the selection of reviewers.

3. For the personnel categories of postdoctoral associates, other professionals, and students (research assistants), the proposal may include information on exceptional qualifications of these individuals that merit consideration in the evaluation of the proposal.
4. The biographical sketches are limited to three (3) pages per investigator and other individuals that merit consideration.

Bibliography

A bibliography of pertinent literature is required. Citations must be complete (including full name of author(s), title, and location in the literature).

Current and Pending Support

This announcement requires all current and pending research support, as defined by Section 223 of the Fiscal Year (FY) 2021 National Defense Authorization Act, must be disclosed at the time of proposal submission, for all covered individuals. Such disclosure will be updated annually during the performance of any research project selected for funding, and whenever covered individuals are added or identified as performing under the project.

1. All project support from whatever source must be listed. The list must include all projects requiring a portion of the PI's and other key personnel's time, even if they receive no salary support from the project(s).
2. The information should include, as a minimum: (i) the project/proposal title and brief description, (ii) the name and location of the organization or agency presently funding the work or requested to fund such work, (iii) the award amount or annual dollar volume of the effort, (iv) the period of performance, and (v) a breakdown of the time required of the PI and/or other key personnel.

Facilities, Equipment, and Other Resources

The applicant is to provide a listing and description of any facilities, equipment, and other resources already available and planned to be used for the project, whether at the home institution or a partner facility. A note of support guaranteeing access to these facilities on behalf of their primary management should also be included. Any Government equipment necessary for performance is to be clearly identified.

Appendices

Some situations require that special information and supporting documents be included in the proposal before funding can be approved. Such information and documentation should be included by appendix to the proposal.

1. To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A Section 1681 Et. Seq.), the Department of Defense is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in STEM disciplines. To enable this assessment, each application must include the following forms completed as indicated.
    a. Research and Related Senior/Key Person Profile (Expanded) form: The Degree Type and Degree Year fields on the Research and Related Senior/Key Person Profile (Expanded) form will be used by DoD as the source for career information. In addition to the required fields on the form, applicants must complete these two fields for all individuals that are identified as having the project role of PD/PI or Co-PD/PI on the form. Additional senior/key persons can be added by selecting the “Next Person” button.
    b. Research and Related Personal Data form: This form will be used by DoD as the source of demographic information, such as gender, race, ethnicity, and disability information for the Project Director/Principal Investigator and all other persons identified as Co-Project Director(s)/Co-Principal Investigator(s). Each application must include this form with the name fields of the Project Director/Principal Investigator or any Co-Project Director(s)/Co-Principal Investigator(s) completed; however, provision of the demographic information in the form is voluntary. If completing the form for multiple individuals, each Co-Project Director/Co-Principal Investigator can be added by selecting the “Next Person” button. The demographic information, if provided, will be used for statistical purposed only and will not be made available to merit reviewers. Applicants who do not wish to provide some or all of the information should check or select the “Do not wish to provide” option.

2. Data Management Plan

A data management plan is a document that describes which data generated through the course of the proposed research will be shared and preserved, how it will be done, or explains why data sharing or

preservation is not possible or scientifically appropriate, or why the costs of sharing or preservation are incommensurate with the value of doing so. See also: DoD Instruction 3200.12. In no more than 2 pages set forth as a separate PDF document, discuss the following:

- The types of data, software, and other materials to be produced.
- How the data will be acquired.
- Expected location of data acquisition, for example ARL facilities and/or your own facilities.
- How the data will be processed and transferred.
- The proposed file formats and naming conventions that will be used.
- A description of how stored data will be accessed for use and reuse, for example on a local server or cloud server, and with login credentials.
- A description of the quality assurance and quality control measures during collection, analysis, and processing.
- A description of dataset origin when existing data resources are used.
- A description of the standards to be used for data and metadata format and content.
- Appropriate timeframe for preservation.
- The plan may consider the balance between the relative value of data preservation and other factors such as the associated cost and administrative burden. The plan will provide a justification for such decisions.
- A statement that the data cannot be made available to the public when there are national security or controlled unclassified information concerns (e.g., "This data cannot be cleared for public release in accordance with the requirements in DoD Directive 5230.09.")

Recipients will be provided with the ARL R2C2 Data Collection and Sharing Standard Operating Procedure. Recipients and ARL collaborators will determine the most appropriate data acquisition, sharing, storage, and transfer approaches.

3. Privacy Act Statement

With the application, the Applicant must provide the following "Privacy Act Statement" consent form for each Covered Individual in the proposal. This form must also be signed by the Applicant as that Individual's Sponsor.

Privacy Act Statement
Army Futures Command or Department of the Army
Application for Federal Assistance

Authority: Government Paperwork Elimination Act (Pub. L. 105-277, 44 U.S.C. 3504); Executive Order 12372, Intergovernmental review of Federal Programs (47 FR 30959); 42 U.S. Code § 6605 – Disclosure of funding sources in applications for Federal research and development awards; Public Law 117-167, CHIPS and Science Act; Public Law 116-92, National Defense Authorization Act for Fiscal Year 2020; 5 U.S.C. 9101, Access to Criminal History for National Security and Other Purposes 5 CFR §1320.8, Agency collection of information Responsibility; 18 U.S.C. § 1001, False Statements, Concealment; E.O. 13478, Amendments to Executive Order 9397 Related to Federal Use of social Security Numbers; NSPM-33, National Security Presidential Memorandum 33 on National Security for United States Research and Development; DoD-D 5240.01, DoD Intelligence Activities; DoD-I 5200.02, Department of Defense Personnel Security Program; Army Regulation 381-10, U.S. Army

Intelligence Activities.

Purpose: The information collected may be used in processing, investigating, and maintaining records relevant to Federal Assistance awarded by the Department of the Army. Records in these systems will be used to ensure Army sponsored and/or awarded federal grants, assistance, contracts, and/or benefits are awarded to responsible parties, entities, and individuals.

Routine Uses: To contractors, grantees, experts, consultants, students, and others performing or working on a contract, service, grant, cooperative agreement, or other assignment for the Federal Government when necessary to accomplish an agency function.

To the appropriate Federal, State, local, territorial, tribal, foreign, or international law enforcement authority or other appropriate entity where a record, either alone or in conjunction with other information, indicates a violation or potential violation of law, whether criminal, civil, or regulatory in nature.

DoD Blanket Routine Use (http://dpcld.defense.gov/privacy).

Effect of not providing information: Providing information to the Department of the Army is voluntary. However, 42 U.S. Code § 6605, which imposes certain disclosure requirements in connection with Federal research and development awards, provides various enforcement mechanisms for non-compliance. One such mechanism, which the Department of the Army intends to pursue here, is rejection of such applications.

Proposal Title (or grants.gov number): _____

Acknowledgment of consent:

Covered individual (Signature): _____Date: _____

Covered individual (Name print): _____

Institution's Authorized Representative (Signature): _____Date: _____

Institution's Authorized Representative (Name print): _____

Institution Name: _____

3. Submission Dates and Times

All proposals for Assistance Instruments (Grants, Cooperative Agreements, and OTs) must be submitted electronically through Grants.gov using the Workspace system. Proposals must be submitted through the applicant's organizational office having responsibility for Government business relations. All signatures must be that of an official authorized to commit the organization in business and financial affairs.

Proposals are due in Grants.gov by 1700 EDT on 17 May 2024. An email receipt will be provided to each Applicant for each Proposal submission received. Applications submitted after the closing date and

time will not be considered or evaluated by the Government.

4. Application Receipt Notices

Grants.gov: After an application is submitted to Grants.gov, the AOR will receive a series of three emails from Grants.gov. The first two emails will be received within 24 to 48 hours after submission. The first email will confirm time of receipt of the application by the Grants.gov system and the second will indicate that the application has either been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors. A third email will be received once the grantor agency has confirmed receipt of the application.

Reference the Grants.gov User Guide at https://www.grants.gov/help/html/help/GetStarted/Get_Started.htm for information on how to track your application package.

For the purposes of this FOA, an applicant's application is not considered received by the Government until the AOR receives email #3.

E. APPLICATION REVIEW / EVALUATION INFORMATION

1. Evaluation Criteria

The following represents the evaluation criteria for this FOA:

Factor 1: Scientific Merit and Relevance: Evaluation of this factor will concentrate on the overall scientific and technical merit, creativity, innovation, and flexibility of the proposed research considering the current state-of-the-art of cybersecurity techniques for military tactical systems as described in this announcement and the expected outcomes based on the timeline of execution. The scientific merit will be evaluated with regard to the specific research topic to be addressed in this Funding Opportunity. Evaluation of this factor will also concentrate on the long-term relevance of the proposed research and the likelihood that the proposed research will address scientific challenges and research barriers facing the Army and commercial sectors.

Factor 2: Research Plan and Plan for Collaboration: Evaluation of this factor will concentrate on the Applicant's strategies, plans and experience in fostering collaborative research and managing collaborative research programs as set forth in this FOA. Evaluation of this factor will include evidence of previous successful collaborative efforts, plans for collaboration and synergy with ARL component research programs and approaches to data/coding/model sharing and transition of products that create collaborative potential amongst government, academic, and industry partners.

Factor 3: Experience and Qualifications of Scientific Staff and Junior Investigator Development: Evaluation of this factor will concentrate on the qualifications, capabilities, availability, proposed level of effort, and experience of both the Applicant's key research personnel (individually and as a whole), their relevant past accomplishments, and their ability to achieve the proposed technical objectives. Key personnel are expected to be substantially and meaningfully engaged in the research and the proposed level of effort for key personnel reflected in the proposal should be commensurate with and demonstrate such engagement. The extent to which the Applicant's proposed facilities and equipment will contribute to

the accomplishment of the proposed research will be evaluated, including the nature, quality, relevance, availability, and access to state-of-the-art research facilities and equipment.

Factor 4: Cost. While this area will not be weighted, evaluation of this area will consider cost realism, cost reasonableness, and affordability within funding constraints. The Government may make adjustments to the cost of the total proposed effort as deemed necessary to reflect what the effort should cost. These adjustments will consider the task undertaken and approach proposed. These adjustments may include upward or downward adjustments to proposed labor hours, labor rates, quantity of materials, price of materials, overhead rates and G&A, etc.

2. Review and Selection Process

a. Upon receipt of a proposal, ARL staff will perform an initial review of its scientific merit and potential contribution to the Army mission, and also determine if funds are expected to be available for the effort. Proposals not considered having sufficient scientific merit or relevance to the Army's needs, or those in areas for which funds are not expected to be available, may not receive further review.
b. All timely and compliant Proposal submissions will be evaluated in accordance with the evaluation criteria, set forth in this FOA, by an evaluation panel of highly qualified subject matter experts, both Government employees and non-Government employees. While the applicant may restrict the evaluation to Government employees, to do so may prevent review of the proposal by other qualified experts in the field of research covered by the proposal. The applicant must indicate on the appropriate proposal form (Form 52 or 52A) any limitation to be placed on disclosure of information contained in the proposal.
c. Evaluation and selection of seedling awards will be based on application of the evaluation factors and ratings to Chapter 1 (Technical Component), Chapter 2 (Technical Component – Option Years), and Chapter 3 (Cost Component).
d. The evaluation panel will provide recommendations for award to the decision maker for the Government. The decision maker will make decisions concerning award selection. The Government reserves the right not to make an award should no acceptable Proposal be submitted.
e. No other material outside of a Proposal will be provided to, or considered by, those evaluating proposals. An initial review of the proposals will be conducted to ensure compliance with the requirements of this FOA. Failure to comply with the requirements of the FOA may result in a proposal not being evaluated and receiving no further consideration for award.
f. Proposals that are timely and in compliance with the requirements of the FOA will be evaluated in accordance with merit based, competitive procedures. These procedures will include evaluation factors that will be evaluated using an adjectival and color rating system as follows:

OUTSTANDING (blue): The proposal is evaluated as outstanding for this factor. The proposal includes one or more significant strengths that are not offset by weaknesses.

GOOD (purple): The proposal is evaluated as good for this factor. The proposal includes some strengths that are not offset by weaknesses.

ACCEPTABLE (green): The proposal is evaluated as acceptable for this factor. Any strengths and weaknesses in the proposal balance out.

MARGINAL (yellow): The proposal is evaluated as marginal for this factor. While the proposal may or may not contain some strengths, and strengths are more than offset by any weakness or weaknesses.

UNACCEPTABLE (red): The proposal is evaluated as unacceptable for this factor. While the proposal may or may not contain some strengths, and strengths are offset by any significant weakness or weaknesses.

Option Years Selection Process

Near the end of the period of performance for the relevant phase of Cycle 4 (e.g., Base year, Option Year 1, Option Year 2), or whenever funding decisions need to be made for the Awarding entity, the decision to exercise option periods of any awards will be made at the discretion of the Government. The Government also reserves the right to negotiate with an Applicant to re-scope their proposal or optional proposal technical focus, period of performance, and associated costs in order to maximize the available program funding, balance of research topics across the program, and overall impact to the program resulting in the development of an annual program plan to cover the optional research to be performed and the period of performance of that research.

3. Army Research Risk Assessment

Proposals are subject to the Army Research Risk Assessment Program as described below.

The Army Research Risk Assessment Program. The Army Research Risk Assessment Program (ARRP) is an adaptive risk management security program, applied to Army-funded research, designed to help protect Army Science and Technology (S&T) by identifying possible vectors of undue foreign influence.

In order to identify and mitigate undue foreign influence as required by federal law and policy, the Army will perform a research risk assessment of each proposal selected based on the criteria above for consideration of a fundamental research grant or cooperative agreement award. ARRP risk assessments for these subject proposals will be developed for all proposed Senior/Key personnel, (also referred to as "Covered Individuals"). These risk assessments will be based on information disclosed in the Standard Form (SF) 424, "Senior/Key Person Profile (Expanded)," any of its accompanying or referenced documents, publicly available information, and information contained in internal Army databases.

Nationality or citizenship is not a factor in the risk assessment.

ARRP has a risk matrix which identifies risk factors and resulting risk ratings. The matrix generally looks at four factors, or risk areas: participation in foreign talent programs; denied entity list affiliation or association (see https://www.bis.doc.gov/index.php/the-denied-persons-list and https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern/entity-list); funding sources to include conflict of interest or conflict of commitment, or funding from a strategic competitor; and foreign influence showing a pattern or history of affiliation, association, or collaboration with a foreign institution, person or entity from a U.S. strategic competitor. The matrix is set forth below:

MATRIX

Rating	Identified Specific Actions of the Senior/Key Personnel			
	Foreign Talent Program	**Denied Entities**	**Funding**	**Foreign Institutions**
HIGH	Indicators of active (ongoing) participation or sponsorship in a strategic competitor Foreign Talent Program	Indicators of an active (ongoing) affiliation or past affiliation or present association with an entity on the U.S. Gov't denied entity or person list or EO 13959 or subsequent similar issuances	Indicators of active (ongoing) conflict of interest, conflict of commitment, or pattern of direct funding from a strategic competitor or country with history of targeting U.S. research or technology	Indicators of active (ongoing) direct affiliation, association or collaboration with a foreign institution, person, or entity from a strategic competitor
MODERATE	Indicators of past participation in a Foreign Talent Program with a U.S. strategic competitor, or country with a history of targeting U.S. research or technology	Indicators of past association with an entity identified in the U.S. Gov't denied entity or person list or EO 13959 or subsequent similar issuances	Indicators of any history or nonconsecutive pattern of, conflict of interest, conflict of commitment, or funding from a strategic competitor or country with history of targeting U.S. research or technology	Indicators of a history or pattern of association or collaboration with foreign institution, person, or entity from a strategic competitor or country with history of targeting U.S. research or technology
LOW	No participation in a Foreign Talent Program	No indicators of past or current association or affiliation with an entity on the U.S. Gov't denied entity or person list or EO 13959 or subsequent similar issuances	No indicators of past funding from a strategic competitor or country with history of targeting U.S. research or technology	No indicators of an association or collaboration with a foreign institution, person, or entity from a strategic competitor or country with history of targeting U.S. research or technology

- **Affiliation** is academic, professional, or institutional appointments or positions with a foreign government-connected entity, whether full-time, part-time, or voluntary (including adjunct, visiting, honorary, or lectures/visits) where direct monetary or non- monetary reward is involved.

- **Association** is academic, professional, or institutional appointments or positions with a foreign government-connected entity, whether full-time, part-time, or voluntary (including adjunct, visiting, honorary, or lectures/visits) where no direct monetary or non-monetary reward is involved.

- **Collaboration** is academic, professional, or institutional agreement to jointly work together with a foreign government- connected entity, whether full-time, part-time, or voluntarily, in an official or unofficial capacity. Co-authorship in research endeavors is an example of collaboration.

- **Strategic competitors** are those adversaries identified in the current year Annual Threat Assessment report from Director of National Intelligence. The 2021 assessment was published on April 9, 2021 and can be found at https://www.dno.gov/index.php/.

- **Conflict of Interest and Conflict of Commitment** are defined in NSPM-33 and in the CONOP as well as the ARRP Policy memorandum.

- **Senior/Key Personnel** are those who (a) contribute in a substantive, meaningful way to the scientific development or execution of a research and development project proposed to be carried out with a research and development award from a Federal research agency; and (b) are designated as a covered individual by the Federal research agency concerned.

ARRP risk ratings range from LOW to HIGH depending on the amount, type, and timing of foreign associations or affiliations that could constitute a foreign-influenced "Conflict of Interest" or "Conflict of Commitment," as defined by National Security Presidential Memorandum 33 (NSPM-33).

Once the research risk assessments are performed, the Army risk acceptance authority has several courses of action available for consideration. These courses of action are as follows:

Course of Action 1 - The Army risk acceptance authority may accept the risk rating that results from the risk assessment process and proceed with the award. This typically happens with proposals with risk ratings of "LOW" but could also happen with the other risk ratings. In Course of Action 1, the applicant will not be required to do anything related to the risk assessment process or the assigned risk rating.

Course of Action 2 - The Army risk acceptance authority may accept the risk rating with some research protection requirements added to the grant or cooperative agreement award. This typically happens with proposals with risk ratings of "MODERATE" but could also happen with the other risk ratings. Also, typically, these added research protection requirements could include, but not be limited to the following in the grant or cooperative agreement award:

- The University's Security Office shall provide the Principal Investigator and key personnel related to this award training on foreign talent recruitment programs and threat awareness and reporting requirements.
- The University shall disclose to the Army Research Laboratory Security Office and Grants Officer all international travel, i.e., all international travel completed as part of any university business, by the Principal Investigator and key personnel related to this award instrument prior to travel.
- The University shall report to the Army Research Laboratory Security Office and Grants Officer all inquiries by foreign operatives or suspected foreign operatives into research associated with the award.
- The University is encouraged to utilize students without potential conflicts of interest or conflicts of commitment as identified in U.S. National Security Presidential Memorandum (NSPM-33).

Under Course of Action 2, the applicant will be asked to sign the grant or cooperative agreement prior to award, confirming agreement to these added requirements. Should the applicant not agree to these added research protection requirements, the Army risk assessment authority may decide not to award.

Course of Action 3 - The Army risk acceptance authority is not willing to accept the risk assigned as a result of the assessment process. In this case, the applicant will be provided an opportunity to provide a risk mitigation plan. This typically happens with proposals with risk ratings of "HIGH" but could also happen with the other risk ratings. In Course of Action 3, the applicant will be informed of the risk rating assigned during the risk assessment process as well as the block(s) on the matrix where the review resulted in some type of finding that contributed to the assigned risk rating. Should the applicant choose to not submit a risk mitigation plan, the Army risk assessment authority may decide not to award. Should the applicant choose to submit a risk mitigation plan, the Army will review such plan. As a result of this review, the Army risk acceptance authority may then be willing to accept the risk assigned with the mitigation plan and proceed with the award or the Army risk acceptance authority may not be willing to accept the risk and may decide not to award. Further, should the risk mitigation plan include proposal revisions that affect those aspects of the proposal included in the review or selection process, the original proposal evaluation will be reviewed and revised as appropriate based on the proposal revisions.

i. Actions Required by Applicants.

(1) By submission of this application and authorized signature on the SF 424 (R&R) Form, the Applicant agrees to comply with the following requirements:

- To certify that each covered individual who is listed on the application has been made aware: (1) of all relevant disclosure requirements, including the requirements of 42 U.S.C. § 6605; and (2) that false representations may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802. See National Science and Technology Council Guidance for Implementing National Security Presidential Memorandum 33 (NSPM-33) on National Security Strategy for United States Government-Supported Research and Development (January 2022), at p. 7 (available at https://www.whitehouse.gov/wp- content/uploads/2022/01/010422-NSPM-33-Implementation-Guidance.pdf).

- To establish and maintain an internal process or procedure to address foreign talent programs, conflicts of commitment, conflicts of interest, and research integrity.

- To exercise due diligence to identify Foreign Components or participation by Senior/Key Personnel in Foreign Government Talent Recruitment Programs and agree to share such information with the Government upon request.

(2) With the application, the Applicant must provide a completed "Privacy Act Statement" consent form for each Covered Individual that is also signed by the Applicant as that Individual's Sponsor. The "Privacy Act Statement" form is included in this FOA.

(3) During the award period of performance:

- If, at any time, during performance of this award, the Recipient learns that its Senior/Key Research Personnel (including any sub-awardee personnel who receive this designation) are or are believed to be participants in a Foreign Government Talent Program or have Foreign Components with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer, the recipient will notify the Government or Grants Officer within 5 business days of awareness.
- This disclosure must include specific information as to the personnel involved and the nature of the situation and relationship. The Government will review this information and conduct any necessary fact-finding or discussion with the Recipient. The Government's determination on disclosure may include acceptance, mitigation, or termination of the award.
- Failure of the Recipient to reasonably exercise due diligence to discover or ensure that neither it nor any of its Senior/Key Research Personnel involved in the subject award are participating in a Foreign Government Talent Program or have a Foreign Component with a strategic competitor or country with a history of targeting U.S. technology for unauthorized transfer may result in the Government exercising remedies in accordance with federal law and regulation.
- The provisions concerning this disclosure will be included in each award.
- The Recipient will be required to flow down this provision to all sub-awardees who have personnel designated as Senior/Key Research Personnel as a result of their involvement in the performance of the research.

ii. Actions Required by Covered Individuals.

Federal law requires that all current and pending research support, as defined by 42 U.S.C. §6605, must be disclosed at the time of proposal submission, for all covered individuals. The Government may require an updated disclosure during the performance of any research project selected for funding. The Government will require an updated disclosure whenever covered individuals are added or identified as performing under the funded project. See definition of "Covered Individuals" below.

Covered Individuals are also required to sign the "Privacy Act Statement" and provide such signed statement to the applicant for submission with the proposal. Any decision to accept a proposal for funding under this announcement will include full reliance on the individual's statements. Failure to report fully and completely all sources of project support and outside positions and affiliations may be considered a material statement within the meaning of the False Claims Act, 31 U.S.C. 3729, and constitute a violation of Federal law.

iii. Privacy Act Compliance.

All information collected and developed for the purpose of conducting ARRP risk assessments will be maintained in accordance with the following authorities:

- Office of Personnel Management (OPM) System of Records Notice (SORN) GOVT-1. This SORN governs information collected from federal grantees for the purpose of conducting a national security investigation or carrying out other lawful statutory, administrative, or investigative purposes of the agency, to the extent the information is relevant and necessary to the requesting agency's decision.

- Department of the Army (DA) SORN A0381-20b-DAMI (Feb. 10, 2009, 74 F.R. 6596). This SORN applies to information contained in systems used by the Department of the Army to develop ARRP risk assessments.

- 32 C.F.R. Appendix A to Part 310, Paragraph N: DoD Blanket Routine Uses. Pursuant to this provision, a record from a system of records maintained by a Component may be disclosed as a routine use outside the DoD or the U.S. Government for the purpose of counterintelligence activities authorized by U.S. law or Executive order or for the purpose of enforcing laws that protect the national security of the United States.

iv. Definitions

- Covered Individual. An individual who contributes in a substantive, meaningful way to the scientific development or execution of a research and development project proposed to be carried out with a research and development award from a Federal research agency; and is designated as a covered individual by the Federal research agency concerned. *See* 42 U.S.C. § 6605, Definitions. (For purposes of this FOA, "covered individuals" are all Senior/Key Personnel.)

- Senior/Key Research Personnel. This term includes the Principal Investigator (PI) and other individuals who contribute to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the award. These include individuals whose absence from the project would be expected to impact the approved scope of the project. (For purposes of this FOA, "Senior/Key Personnel" are all considered "covered individuals."

- Foreign Associations and Affiliations. Association is defined as collaboration, coordination or interrelation, professionally or personally, with a foreign government-connected entity where no

direct monetary or non-monetary reward is involved. Affiliation is defined as collaboration, coordination, or interrelation, professionally or personally, with a foreign government-connected entity where direct monetary or non-monetary reward is involved.

- Foreign Government Talent Recruitment Programs. In general, these programs include any foreign-state-sponsored attempt to acquire U.S. scientific-funded research or technology through foreign government-run or funded recruitment programs that target scientists, engineers, academics, researchers, and entrepreneurs of all nationalities working and educated in the U.S. Distinguishing features of a Foreign Government Talent Recruitment Program may include:
  - Compensation, either monetary or in-kind, provided by the foreign state to the targeted individual in exchange for the individual transferring their knowledge and expertise to the foreign country. In-kind compensation may include honorific titles, career advancement opportunities, promised future compensation or other types of remuneration or compensation.
  - Recruitment, in this context, refers to the foreign-state-sponsor's active engagement in attracting the targeted individual to join the foreign-sponsored program and transfer their knowledge and expertise to the foreign state. The targeted individual may be employed and located in the U.S. or in the foreign state.
  - Contracts for participation in some programs that create conflicts of commitment and/or conflicts of interest for researchers. These contracts include, but are not limited to, requirements to attribute awards, patents, and projects to the foreign institution, even if conducted under U.S. funding, to recruit or train other talent recruitment plan members, circumventing merit-based processes, and to replicate or transfer U.S.-funded work in another country.
  - Many, but not all, of these programs aim to incentivize the targeted individual to physically relocate to the foreign state. Of particular concern are those programs that allow for continued employment at U.S. research facilities or receipt of U.S. Government research funding while concurrently receiving compensation from the foreign state.
  - Foreign Government Talent Recruitment Programs do **not** include research agreements between the University and a foreign entity, unless that agreement includes provisions that create situations of concern addressed elsewhere in this section; agreements for the provision of goods or services by commercial vendors; or invitations to attend or present at conferences.

- Conflict of Interest. A situation in which an individual, or the individual's spouse or dependent children, has a financial interest or financial relationship that could directly and significantly affect the design, conduct, reporting, or funding of research.

- Conflict of Commitment. A situation in which an individual accepts or incurs conflicting obligations between or among multiple employers or other entities. Common conflicts of commitment involve conflicting commitments of time and effort, including obligations to dedicate time in excess of institutional or funding agency policies or commitments. Other types of conflicting obligations, including obligations to improperly share information with, or withhold information from, an employer or funding agency, can also threaten research security and integrity and are an element of a broader concept of conflicts of commitment.

- Foreign Component. Performance of any significant scientific element or segment of a program or project outside of the U.S., either by the University or by a researcher employed by a foreign organization, whether or not U.S. government funds are expended. Activities that would meet this definition include, but are not limited to: involvement of human subjects or animals; extensive foreign travel by University research program or project staff for the purpose of data collection, surveying, sampling, and similar activities; collaborations with investigators at a foreign site anticipated to result in co-authorship; use of facilities or instrumentation at a foreign site; receipt of financial support or resources from a foreign entity; or any activity of the University that may have an impact on U.S. foreign policy through involvement in the affairs or environment of a foreign country.

- Strategic Competitor. A nation, or nation-state, that engages in diplomatic, economic or technological rivalry with the United States where the fundamental strategic interests of the U.S are under threat.

4. Recipient Qualification

The Grants Officer is responsible for determining a Recipient's qualification prior to award. In general, a Grants Officer will award grants or CAs only to qualified Recipients that meet the standards at 32 CFR 22.415. To be qualified, a potential Recipient must:

- Have the management capability and adequate financial and technical resources, given those that would be made available through the grant or cooperative agreement, to execute the program of activities envisioned under the grant or cooperative agreement;
- Have a satisfactory record of executing such programs or activities (if a prior Recipient of an award);
- Have a satisfactory record of integrity and business ethics; and
- Be otherwise qualified and eligible to receive a grant or cooperative agreement under applicable laws and regulations (see 32 CFR 22.420(c)). Applicants are requested to provide information with proposal submission to assist the Grants Officer's evaluation of Recipient qualification.

In accordance with OMB guidance in parts 180 and 200 of Title 2, CFR, it is DoD policy that DoD Components must report and use integrity and performance information in the Federal Awardee Performance and Integrity Information System (FAPIIS), or any successor system designated by OMB, concerning grants, cooperative agreements, and OTs as follows:

If the total Federal share will be greater than the simplified acquisition threshold on any Federal award under a notice of funding opportunity (see 2 CFR 200.88 Simplified Acquisition Threshold):

- The Federal awarding agency, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, will review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313);

- An applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM;

The Federal awarding agency will consider any comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in 2 CFR 200.205 Federal awarding agency review of risk posed by applicants.

F. AWARD ADMINISTRATION INFORMATION

1. Award Notices

Should your Proposal be selected for award, you will be contacted telephonically or via email by the Grants Officer or his/her representative to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, and other information as applicable to the proposed award. The anticipated start date will be determined at that time.

The award document signed by the Government Grants Officer is the official and authorizing award instrument.

2. Administrative and National Policy Requirements

a. Each award under this announcement will be governed by the general award terms and conditions in effect at the time of the award that conform to DoD's implementation of OMB guidance applicable to financial assistance in 2 CFR part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards." The DoD Research and Development General Terms and Conditions (latest version, January 2023) are located at https://www.onr.navy.mil/work-with-us/manage-your-award/manage-grant-award/grants-terms-conditions. These terms and conditions are incorporated by reference in this announcement.

b. You must comply with all applicable national policy requirements. The key national policy requirements that may relate to an award under this FOA are included in the terms and conditions specified in paragraph 2.a above.

c. By electronically signing the SF 424, the applicant affirms its agreement with the following certification.

Certification Required for Grant and Cooperative Agreement Awards

The Certification at Appendix A to 32 CFR Part 28 regarding lobbying: Certification for Contracts, Grants, Loans, and Cooperative Agreements the undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit SF-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions..

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Representations Required for Grant and Cooperative Agreement Awards

Appropriations Provisions on Tax Delinquency and Felony Conviction

Check either “is” or “is not” for each of these two representations, as appropriate for the proposing institution, include the AOR signature and point of contact information, and attach the representation page to Field 12 of the SF 424 Research & Related Other Project Information form. The page for these representations is provided with the application materials that are available for download at Grants.gov.

Representations:
The applicant is ( ) is not ( ) a “Corporation” meaning any entity, including any institution of higher education, other nonprofit organization, or for-profit entity that has filed articles of incorporation. If the applicant is a “Corporation” please complete the following representations:

a. The applicant represents that it is ( ) or is not ( ) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
b. The applicant represents that it is ( ) is not ( ) a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

NOTE: If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the agency suspension and debarment official (SDO) has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore should provide information about its tax liability or conviction to the agency's SDO as soon as it can do so, to facilitate completion of the required considerations before award decisions are made.

OMB CONTROL NUMBER: 0704-0494 OMB
EXPIRATION DATE: 11/30/2019

AGENCY DISCLOSURE NOTICE

The public reporting burden for this collection of information is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Directives Division, 4800 Mark Center Drive, East Tower, Suite 02G09, Alexandria, VA 22350-3100 [0704-0494]. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Prohibition on Contracting with Entities that Require Certain Internal Confidentiality

Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements

Agreement with the representation below will be affirmed by checking the "I agree" box in block 17 of the SF 424 (R&R) as part of the electronic application submitted via Grants.gov. The representation reads as follows:

By submission of its application, the applicant represents that it does not require any of its employees, contractors, or Subrecipients seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting those employees, contractors, Subrecipients from lawfully reporting that waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

Note that: (1) the basis for this representation is a prohibition in Section 743 of the Financial Services and General Government Appropriations Act, 2015, Pub. L. 113-235) on provision of funds through grants and cooperative agreements to entities with certain internal confidentiality agreements or statements; and (2) Section 743 states that it does not contravene requirements applicable to SF-312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

Section 889 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2019

Section 889 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2019 (Public Law 115-232) prohibits the head of an executive agency from obligating or expending loan or grant funds to procure or obtain, extend, or renew a contract to procure or obtain, or enter into a contract (or extend or renew a contract) to procure or obtain the equipment, services, or systems prohibited systems as identified in section 889 of the NDAA for FY 2019.

(1) In accordance with 2 CFR 200.216 and 200.471, all awards that are issued on or after August 13, 2020, recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

1. Procure or obtain;
2. Extend or renew a contract to procure or obtain; or,
3. Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115- 232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

(a) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(b) Telecommunications or video surveillance services provided by such entities or using such equipment.

(c) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

(2) In implementing the prohibition under Public Law 115-232, section 889, subsection (f), paragraph (1), heads of executive agencies administering loan, grant, or subsidy programs shall prioritize available funding and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered communications equipment and services, to procure replacement equipment and services, and to ensure that communications service to users and customers is sustained.

(3) See Public Law 115-232, section 889 for additional information.

COVERED FOREIGN COUNTRY means the People's Republic of China.

G. AGENCY CONTACTS

All questions or comments concerning this FOA should be submitted via email to usarmy.apg.devcom-arl.mbx.sara-cra@army.mil on or before the deadline (see Event timeline above). Questions and comments should be concise and to the point. In addition, the relevant part and paragraph of the FOA must be referenced. Responses to non-proprietary questions received by the specified date will be posted to the SARA CRA website for the benefit of all interested parties. Should an Applicant have questions they believe are of a proprietary nature, the Applicant must clearly state so and identify and mark the proprietary information in the question when submitted. Answers to questions of a proprietary nature will be provided via email directly to the requestor of the question and not posted on the SARA website.

H. OTHER – HUMAN SUBJECTS

For Assistance Instruments:

a) The Recipient must protect the rights and welfare of individuals who participate as human subjects in research under this award and comply with the requirements at 32 CFR part 219, Department of Defense Instruction (DoDI) 3216.02, 10 U.S.C. 980, and when applicable, Food and Drug Administration (FDA) regulations.
b) The Recipient must not begin performance of research involving human subjects, also known as human subjects research (HSR), that is covered under 32 CFR part 219, or that meets exemption criteria under 32 CFR 219.101(b), until you receive a formal notification of approval from a DoD Human Research Protection Official (HRPO). Approval to perform HSR under this award is received after the HRPO has performed a review of the Recipient's documentation of planned HSR activities and has officially furnished a concurrence with the Recipient's determination as presented in the documentation.
c) In order for the HRPO to accomplish this concurrence review, the Recipient must provide sufficient documentation to enable his or her assessment as follows:
    i. If the HSR meets an exemption criterion under 32 CFR 219.101(b), the documentation must include a citation of the exemption category under 32 CFR 219.101(b) and a rationale statement.
    ii. If the Recipient's activity is determined as "non-exempt research involving human subjects", the documentation must include:
        - Assurance of Compliance (i.e., Department of Health and Human Services Office for Human Research Protections (OHRP) Federal Wide Assurance (FWA)) appropriate for the scope of work or program plan; and
        - Institutional Review Board (IRB) approval, as well as all documentation reviewed by the IRB to make their determination.
d) The HRPO retains final judgment on what activities constitute HSR, whether an exempt category applies, whether the risk determination is appropriate, and whether the planned HSR activities comply with the requirements in paragraph (a) of this section.

e) The Recipient must notify the HRPO immediately of any suspensions or terminations of the Assurance of Compliance.
f) DoD staff, consultants, and advisory groups may independently review and inspect the Recipient's research and research procedures involving human subjects and based on such findings, DoD may prohibit research that presents unacceptable hazards or otherwise fails to comply with DoD requirements.
g) Definitions for terms used in this article are found in DoDI 3216.02.