



Research Announcement
Young Faculty Award (YFA)

DARPA-RA-16-63

September 30, 2016

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ATTACHMENT 1: EXECUTIVE SUMMARY TEMPLATE

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PART I: OVERVIEW INFORMATION

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Defense Sciences Office (DSO)
- **Funding Opportunity Title:** Young Faculty Award (YFA)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** DARPA-RA-16-63
- **Catalog of Federal Domestic Assistance (CFDA) Number(s):** 12.910 Research and Technology Development
- **Dates** (All times listed herein are Eastern Time.)
 - Posting Date: September 30, 2016
 - Proposers Day: October 3, 2016. See Section VIII.C.
 - Executive Summary Due Date: November 1, 2016, 4:00 p.m.
 - FAQ Submission Deadline: January 11, 2017, 4:00 p.m. See Section VIII.A.
 - Full Proposal Due Date: January 18, 2017, 4:00 p.m.
- **Anticipated Individual Awards:** Multiple awards are anticipated.
- **Anticipated Funding Available for Award:** each award will include funding for a 24-month base period (a maximum of \$500,000) and a 12-month option period (a maximum of \$500,000).
- **Types of Instruments that May be Awarded:** Grants
- **Agency contacts**
 - **Technical POC:** RA Coordinator, DARPA/DSO
 - **Solicitation Email:** YFA2017@darpa.mil
 - **Solicitation Mailing Address:**
DARPA/DSO
ATTN: DARPA-RA-16-63
675 North Randolph Street
Arlington, VA 22203-2114
- **DARPA/DSO Solicitation Website:** <http://www.darpa.mil/work-with-us/opportunities>
- **Teaming Information:** See Section VIII.B for information on teaming opportunities.
- **Frequently Asked Questions (FAQ):** FAQs for this solicitation may be viewed on the DSO Solicitation Website. See Section VIII.A for further information.

PART II: FULL TEXT OF ANNOUNCEMENT

I. Funding Opportunity Description

This RA is being issued, and any resultant selection will be made, using procedures under Federal Acquisition Regulation (FAR) 35.016 and 2 Code of Federal Regulations (CFR) § 200. Any amendments to this RA will be posted to the Federal Business Opportunities (FBO) website (<http://www.fbo.gov/>) and the Grants.gov website (<http://www.grants.gov/>).

A. Introduction

The Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA) program aims to identify and engage rising stars in junior faculty positions in academia and equivalent positions at non-profit research institutions and expose them to Department of Defense (DoD) and National Security challenges and needs. In particular, this YFA will provide high-impact funding to elite researchers early in their careers to develop innovative new research directions in the context of enabling transformative DoD capabilities. The long-term goal of the program is to develop the next generation of scientists and engineers in the research community who will focus a significant portion of their future careers on DoD and National Security issues. DARPA is particularly interested in identifying outstanding researchers who have previously not been performers on DARPA programs, but the program is open to all qualified applicants with innovative research ideas.

Before preparing an executive summary or proposal submission, proposers are encouraged to review the DARPA mission statement and current program descriptions at the DARPA website <https://www.darpa.mil> to familiarize themselves with examples of current DARPA investments. This is not meant as instruction to duplicate those efforts, but rather to illustrate that current programs are aimed at research that will substantially advance our capabilities in these areas. Once awards are made, each YFA performer will be assigned a DARPA Program Manager with interests closely related to their research topic. The Program Manager will act as project manager and mentor to the YFA award recipients.

Proposers should also familiarize themselves with the “Heilmeier Catechism.” Details about the catechism and questions it seeks to answer can be found at <https://www.darpa.mil/work-with-us/heilmeier-catechism>.

B. Program Description

DARPA is soliciting innovative research proposals in the areas of physical sciences, engineering, materials, mathematics, biology, computing, informatics, social science, and manufacturing of interest to DARPA’s Defense Sciences Office (DSO), Microsystems Technology Office (MTO), and Biological Technologies Office (BTO). Further detail regarding the specific technical areas of interest can be found under Section I.E “Topic Areas (TAs).” Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

Submissions responding to this RA should clearly describe the DoD problem being addressed, the current state-of-the-art technology, new insights to address the problem, a credible research plan and schedule, and critical, quantitative milestones to be pursued over the research period.

This RA seeks grant proposals only. Submissions for any other instrument type may be considered non-conforming with the RA and may not be reviewed.

C. Program Structure

This RA seeks grant proposals for a research activity consisting of a 24-month base period and a 12-month option period, each with a maximum funding level of \$500,000. The 12-month option period, referred to as the “Director’s Fellowship,” will be reserved for a limited number of awardees who demonstrate exceptional YFA project performance over the 24-month base period.

Proposals should include a 24-month base period not to exceed \$500,000. A target start date of July 2017 may be assumed for planning purposes. Each 12 month interval of the base period should not exceed \$250,000. Proposals should also include a short summary of the proposed follow-on work for the estimated 12-month “Director’s Fellowship” option period not to exceed \$500,000.

As part of the program, a number of visits/exercises at a variety of DoD sites and facilities will be scheduled. These briefings and visits will provide YFA recipients a unique, first-hand exposure to DoD personnel and technologies in the field, issues faced by the Military Services in execution of their missions, and current National Security challenges. It is expected that YFA recipients will participate in a subset of the visits/exercises made available to them. Participation in all such opportunities is not a requirement; however, lack of participation may impact the award of the Director’s Fellowship. Proposers are expected to include the necessary travel funds within the total budget of their proposal. For budgeting purposes, please plan for a minimum of four two-day meetings over the course of the 24 month base period, and 2 meetings over the course of the 12 month option period (three meetings in the Washington, D.C. area and three meetings in the San Francisco, CA area).

D. Eligibility

Participation in the YFA program is limited to Assistant or Associate Professors within eight (8) years of appointment to a tenure-track position at a U.S. institution of higher education or equivalent at a non-profit science and technology research institution in the United States. Proposals are not being sought from foreign organizations.

Previous YFA recipients are not eligible to apply to this or any future YFA program. Please see Section III for more details.

E. Topic Areas (TAs)

This RA solicits single principal investigator (PI) proposals for research and development in the specific TAs of interest articulated below. Prior to submitting a full proposal, proposers are *strongly encouraged* to first submit an executive summary as described in Section IV. Only one executive summary and one full proposal submission is allowed per PI. **Executive Summaries and full proposals must specify ONE and only one of these TAs for their submission and identify this TA on the submission's cover page.** DARPA reserves the right to assign proposals to a different topic area than indicated by the proposer.

Potential applicants are encouraged to carefully consider the descriptions of the TAs before proposing. Executive Summaries and Full Proposals that do not clearly address a specific topic may be deemed non-responsive and may not be reviewed.

Potential applicants that have questions about specific TAs should email YFA2017@darpa.mil with the TA stated in the subject line. Your question will be distributed to the appropriate contact. Please see Section VIII.A for more details regarding the question and answer process.

1. Analysis, Inference and Control of Time-Varying Networks

For complex systems of interest such as biological and social systems, there exist no analytical modeling tools that could adequately capture the complex and multiscale nature of these systems. This topic seeks innovative mathematical research at the intersection of statistics, dynamics, computational topology, spectral theory, and control theory to develop new methods for analysis, inference or control of time evolving networks and dynamical systems which are modeled using data-driven techniques. Proposals could address mathematical questions such as causal inference in time-evolved networks with limited or missing information, control methodologies for data-driven models, or analysis methods which could handle the high-dimensional, highly correlated data sets that correspond to these complex systems and networks of interest.

2. Geometric Methods in Optimization

This topic seeks mathematical methods based on computational geometry and topology, geometric probability theory and infinite-dimensional optimization, and variational methods to open new frontiers in solving a large class of high-dimensional optimization in applications to problems in logistics and planning, machine learning and material design, among others. The goal is to explore geometric principles and properties of the optimization problem to reveal structure and patterns that could lead to development of more efficient algorithms for the computationally challenging optimization problems.

3. Functional Mathematical Tools in Design

This topic seeks proposals that leverage advanced mathematical concepts including, but not limited to, category theory, co-chains, and operads to characterize and synthesize complex mechanical assemblies with multi-physics interactions that perform a desired function (e.g., flight). The goal is to explore such mathematical concepts for design, demonstrate how they could be leveraged to build practical systems to aid in design synthesis and quantify both the advantages of the technical approach as well as identify its limitations. All proposals to this topic should provide a basic overview of the mathematical concept and how it will be adapted to

address real world defense applications. The proposals should define at least one target DoD problem that can be used as a test case for the proposed solution

4. Emergent properties of nano-engineered materials

This topic seeks innovative approaches for modeling and engineering novel materials to obtain desired system-level properties. Of particular interest are approaches that take advantage of new additive manufacturing, nano-scale engineering, and other materials fabrication processes to obtain previously unachievable macroscopic properties in the electric, thermal, optical, mechanical and/or hybrid domains. Materials of interest include novel superconductors, topological insulators, phase change materials, multiferroics, thermoelectrics, photostrictive and optoelectronic materials, structural materials, and other DoD-relevant materials having properties that can be modulated to serve new systems requirements.

5. How, When, and Why the Social Becomes the Biological

The question of how, when, and why different human social phenomena (collective structures, organizations, interactions, behaviors, etc.) can come to be encoded or registered as biological phenomena at an individual level (genetic and epigenetic regulation, neurobiological structure/function, psychophysiology, etc.) remains a "grand challenge" for both social and biological sciences. The impacts of social phenomena, such as group cohesion and leadership or cooperation and competition among different social entities, on individual biological systems and functions are being increasingly documented. However, there remain deep questions about what, if any, theories can most accurately explain or predict different causal mechanisms and time scales through which these social-to-biological dynamics can occur. With some promising advances in animal research, as well as new and growing datasets and computational modeling approaches, this topic seeks new ways to tackle this challenge to provide greater insight into how, when, and why the social becomes the biological.

6. Characterizing Micro-Macro Dynamics in Social-like Systems

Social-like systems are complex systems where agents have some limited notion of themselves, their properties or nature, as well as some awareness of other agents (a.k.a. "not self"). Importantly, these notions of themselves and the self/not-self distinction may be plastic, which can be affected through interactions with and feedback from other agents or the environment. From sociology, economics, and ecology, to other physical, biological, and material sciences, a critical challenge remains in understanding the dynamic interplay among agents and their behaviors at a microscale that influence more global behaviors and patterns at a macroscale. This topic seeks ideas to address whether there are common, first principles of micro-macro dynamics that recur across different, seemingly unrelated social-like systems. Of interest are best methods for identifying and modeling causal relationships, exploring the phase transitions of micro-macro dynamics change, capturing contextual information to inform how and where certain dynamics are operative, predicting how behavior at one level affects other levels, and quantifying uncertainty in these models.

7. Rapid Countermeasure Discovery via Functional Evolution

Biological threats, such as new strains of virulent microbes and viruses, as well as the looming potential of weaponized biological systems, pose a serious risk to military readiness. Transformative approaches that can rapidly generate translatable small molecules to combat new

threats as they arise are needed. The objective of the Functional Evolution topic is to build a system that can rapidly evolve molecular countermeasures under conditions that mimic those found in the human body (as opposed to state-of-the-art screening in vitro). Successful outcomes should realize new methods to rapidly yield deployable bio-warfare agent countermeasures.

8. Designing Metasurfaces Using Inverse Scattering Methods

Metasurfaces hold the promise of high-quality, manufacturable “flat” optics that efficiently scatter incident fields in a prescribed way, either in reflection or transmission. This effort should be focused on new approaches for designing metasurfaces based on solving electromagnetic inverse scattering problems. Algorithms should incorporate multiple scattering within and between resonant subwavelength-sized elements, and allow their form-factors and the unit cell dimensions to be incorporated into the inverse algorithm as prior knowledge (i.e., as constraints). The capability to move beyond simulations and fabricate and test surfaces designed using these algorithms is desirable/expected.

9. Designing Structured Materials for Improved Parametric Processes

Nonlinear responses in materials provide mechanisms for switching, thresholding, low noise amplification and frequency generation. The goal is to develop an artificial nonlinear medium by modeling the dynamics of coupling and energy transfer in and between elements of electromagnetically resonant structures with different quality factors (Qs). Of particular interest is using these elements for nonharmonic frequency generation and also high-frequency generation from a difference frequency. Any appropriate theoretical model based on simple example structures will be considered, including a circuit or scattering model.

10. Synthesis of Three-dimensional Molecular Assemblies

This topic seeks generalizable, scalable approaches to selectively react, join, or otherwise build three-dimensional molecular assemblies with atom-scale precision. Methods must be wholly synthetic (i.e., of abiotic or non-natural origin) and should not require localized manipulation (e.g., no Atomic Force Microscopy (AFM) based pick-and-place approaches). Strategies such as self-limiting and/or orthogonal reactions for self-assembly are of interest, as well as completely new approaches that ensure chemical selectivity in a scalable, heterogeneous system. Our core interest is development and demonstration of a generalizable strategy that can be tailored for different chemistries/compositions. Proposers may choose their own system design including substrate, shape and composition of the three-dimensional assembly, and targeted physical properties. However, both the approach and anticipated properties of the molecular assembly should be outlined in the proposal.

11. DNA Encryption

This topic seeks development of technologies that enable the protection of large amounts of digital data that can be stored in deoxyribonucleic acid (DNA). DNA offers many advantages for data storage, including high data density, long-term stability, and resistance to obsolescence. DNA computing and storage capabilities have not yet achieved the technological readiness levels or the economic feasibility for widespread adoption. While the development of conventional data storage methods (e.g., hard disk or solid-state drives) preceded the implementation of encryption technologies, this topic is interested in the immediate pursuit of novel DNA encryption methodologies and tools to be developed prior to, or in parallel with, the development

of DNA data storage and computing capabilities. This will ensure that future DNA-based data storage modalities can be robustly protected from their inception. Specific areas of interest include *in silico*, *in vitro*, and/or *in vivo* demonstration of obfuscation strategies, encryption, and secure communication/data transfer.

12. Ecological Niche-preference Engineering

This topic seeks development of technologies that enable the genetic engineering of an organism's preference for a niche (e.g., temperature range, food source, and habitat). Organisms, such as Darwin's finches, have evolved to thrive in specific niches with both genetic and physiological manifestations. However, niche preferences of some organisms—for example, disease transmitting insects, biofouling microorganisms, and crop pests—can interfere with human health, infrastructure, and agriculture. DARPA envisions creating genetic engineering strategies to control and alter the niche preferences of organisms to reduce economic, health, and resource burdens. A fundamental component of this work will be to expand our understanding of the genetic, epigenetic, and molecular contributors to the establishment of niche preference.

13. Engineered Neurobiological Systems

Biological sensors and neural circuits remain unparalleled in their capacity to sense, detect, and problem solve. This topic seeks to advance our ability to harness and engineer complex biological systems to perform enhanced sensing and detection. Focus should be on utilizing the strengths of neural circuits to process noisy data, rapidly ingest environmental stimuli, and perform pattern recognition. This topic is also interested in developing and integrating biological reporting capabilities such as integrated optical reporters or harnessed behavior. Emphasis should be placed on biological-based reporters capable of providing multiplexed output. Strategies to link sensors, neural circuits, and reporters should be clearly outlined, and may involve electrical, chemical, genetic, or other means of control. A variety of *in vivo* and *in vitro* preparations across a wide range of animal models will be considered. Functional linking of sensing, processing, and reporting components should be demonstrated within the period of performance.

14. Biopolymers on Demand

This topic seeks proposals to develop strategies to assemble programmed biopolymer sequences *de novo* and *in vivo*. While the vast majority of biopolymers in a cell follow the central dogma of biology—namely that DNA is transcribed into RNA, which is translated into protein—native enzymes and pathways exist for alternative biopolymer production. For example, Poly-A tails may be appended to transcribed RNAs and nonribosomal peptides are generated from enzyme clusters. The ability to control such processes dynamically could enable revolutionary advances to synthetic biology, organism development, and biological control. Approaches must involve template-free biopolymer production and/or the ability for substantial, targeted, and programmable editing of an existing biopolymer.

15. Reprogramming Larval Behavior in the Sea

This topic seeks innovative methods to control the behavior of marine invertebrate larvae during dispersal and settlement, with the long term aims of reducing the operational costs of biofouling, reinforcing food security, and accelerating ecosystem recovery. Specific areas of interest include, but are not limited to, genetic, epigenetic, biochemical, microbial, or conditioning-based

approaches that alter settlement habitat preferences in a lab-raised cohort of larvae, or that alter settlement rates of larvae in the ocean by redirecting them to a specific surface or beacon. Also of interest are methods to predict larval behaviors or behavioral cues from genomic or metabolomic data and novel high-throughput approaches to accelerate research on larval biology. Projects focused on antifouling coatings are not of interest at this time.

16. Novel Approaches to Reduce Agricultural Loss and Increase Crop Productivity

This topic seeks novel approaches to limit agricultural loss and increase crop productivity. As global connectivity and environmental stressors increase, it is essential to develop technologies which counter agricultural threats as they arise. This topic aims to develop technology to mitigate the pests and/or pathogens through molecular approaches, and then, recover from crop loss by increasing the rate of plant phenology. The first objective is to mitigate pests and/or pathogens of biosecurity importance with genetic countermeasures which includes the use of ribonucleic acid interference (RNAi) or ribonuclease H (RNaseH) that can be quickly produced and easily deployed in a field setting. Then, through genetic modification for more robust plant life cycle, alter phenology to improve crop recovery from yield losses due to viral, fungal, bacterial, or insect outbreak. We can salvage crop yields by inducing perennial crops to produce within one season or allow annual crops to survive for multiple seasons. Phenology control would prevent large losses from occurring during the immediate season and, often more devastating, limit effects during the next few seasons as a production system re-builds. We seek innovative research aimed at protecting our nation's agriculture disruption through (1) highly specific and fast genetic countermeasures and (2) innovative genomic approaches to alter plant phenology.

17. Life-Long Learning

This topic seeks innovative research on life-long learning algorithms and systems that can modify their architecture and function in reaction to dynamic changes in their inputs and goals. This topic requests solutions that go well beyond current methods of learning networks, whose parameters are derived from training data. The key challenge for such systems is to adapt continuously without forgetting previous knowledge. This topic is also interested in systems that are sensitive to changing contexts. These systems will likely require recurrence and temporal awareness to create a combined top-down, bottom-up, goal-driven approach. Topics of interest include both algorithms that adapt (based on network structure or otherwise) during operation and hardware systems that efficiently modify in useful ways to changes in data. Research efforts that leverage bio-inspired features are of particular interest. These features include, but are not limited to, plasticity, randomness, asynchrony, analog computing, and minimizing energy and/or precision. Hardware approaches could include circuits that adapt to their inputs or synthetic biological devices. Also of interest is research in the fundamental theory of how systems can modify their architecture and function in reaction to dynamic changes in their environment, including characterization of their functional capabilities, time and resource efficiency, training rules, and methods to enforce bounds on the behaviors of such systems.

18. Online Machine Learning for Sequential Decision Making

This topic seeks novel methodologies in hardware/software codesign for advancing online machine learning scenarios in support of sequential decision-making problems in case of uncertainty. For this research, development of predictive algorithms comprises half of the

technology interest of this topic. An equally important aspect of this topic is research into novel devices (or existing devices used in novel ways), to reduce computational time needed to execute these algorithms and potentially reduce the amount of energy consumed as well. Training continuously to update models from streaming data while measuring uncertainty will take deliberate and synergistic advancements from both the hardware and software directions. Specific algorithmic research areas of interest include stochastic optimization, approximate dynamic programming, reinforcement learning, contextual multi-armed bandits, dimensionality reduction, and classification in streaming feature and label environments. Hardware innovations of interest span the entire device architecture to include memory, computation, and interconnected sub-systems. Approaches of interest include novel mixed-signal circuit designs, memristors or floating gate transistors, and other uses of hot carrier injection. Researchers should plan on demonstrating a prototype or proof-of-concept circuit that accelerates one or more online learning algorithms as compared to the execution of the same (or comparable) algorithms on a conventional system.

19. Collaborative RF Systems

In emerging small autonomous platforms, the size, weight, power and cost (SWaP-C) of radio frequency (RF) systems are heavily constrained, limiting the functionality (noise, bandwidth, linearity, etc.) when compared to traditional RF systems on full-scale platforms. It is anticipated that having multiple platforms collaborate and share data can not only recover system performance, but also enable new capabilities due to the distributed nature of the system. This topic seeks innovations in collaborative RF systems where the use of many inferior nodes provides superior system performance for relevant RF metrics. Emphasis should be placed on determining what information should be shared, how much information should be phase coherent or time synchronized, and to what accuracy, and, finally, how limited or degraded can the capabilities of a single RF node be while continuing to provide enhanced system performance through the collaboration of many nodes. Innovative ideas in new hardware that enable the RF functionality of small, collaborative systems are encouraged.

20. Millimeter-wave Passive Components

This topic seeks innovative concepts and manufacturing methods for creating high performance, low cost, and highly integrable millimeter-wave passive components. Components of interest include, but are not limited to: low-loss, low-dispersion, and high-density transmission line interconnects that can incorporate discrete components such as resistors, capacitors, and MMICs; hybrid and directional couplers; power splitters and combiners; low-loss, high-quality factor filters with good impedance matching; and high-gain, lightweight antenna structures. Proposals should explicitly state the core innovative concept being pursued, and quantitatively compare the potential performance of the proposed technology to the current state of the art. Using novel materials and/or fabrication techniques including MEMS micromachining, self-assembly, additive manufacturing, or other methods, the research will develop, demonstrate, and characterize selected millimeter-wave passive components, with an emphasis on validating high performance, low manufacturing cost, and integration capability. The research also should result in predictive, physics-based models that can allow other researchers to access and evaluate these new component technologies.

21. Improving Utilization of Open Source Software

This topic seeks new ideas for how to easily bring user-accessibility, graphical user interfaces, and robustness to Free and Open Source Software (FOSS) projects. Use and adoption of FOSS is increasingly an integral part of daily life. Within the U.S. government, both the White House and the DoD have made moves to engage with FOSS projects. As FOSS projects are generally motivated and led by a technical community of people, the focus tends to be on the development of the project, which can take precedence over the user's experience with the project. Areas of interest include, but are not limited to, human-computer interfaces to support models of programmer-program relationships and user-program relationships; self-describing/self-documenting code; quality assurance/verification of graphical user interfaces (GUIs); hardware-in-the-loop testing and development; and multi-platform, architecture, and processor support.

22. Innovative SDR Uses

Software defined radio (SDR) is the de facto way of building radio systems, from specialized baseband processors for a single standard, to more mission-driven field-programmable gate array (FPGA) implementations, to highly flexible and adaptive general purpose processor-based concepts. This topic seeks innovations in the latter: finding new application spaces where dynamic, flexible, and adaptive SDR creates new models of interacting with the electromagnetic spectrum. An emphasis is placed on multi-dimensional, multi-objective problem spaces where the radio, or more accurately an electromagnetic emitter and receiver, is one of many sensors and actuators that interacts with the physical world for both awareness, feedback, learning, and effecting change.

II. Award Information

A. Awards

Multiple awards are anticipated. Awards under this solicitation will be made to proposers whose proposals are determined to be the most advantageous and provide best value to the Government, all factors considered, including the potential contributions of the proposed work, overall funding strategy, and availability of funding. See Section V for further information.

The Government reserves the right to:

- select for negotiation all, some, one, or none of the proposals received in response to this solicitation;
- make awards without discussions with proposers;
- conduct discussions with proposers if it is later determined to be necessary;
- segregate portions of resulting awards into pre-priced options;
- accept proposals in their entirety or to select only portions of proposals for award;
- fund proposals in increments with options for continued work at the end of one or more phases;
- request additional documentation once the award instrument has been determined (e.g., representations and certifications); and
- remove proposers from award consideration should the parties fail to reach agreement on award terms within a reasonable time or the proposer fails to provide requested additional information in a timely manner.

Proposals identified for negotiation may result in a grant.

In all cases, the Government contracting officer shall have sole discretion to select award instrument type and to negotiate all instrument terms and conditions with selectees. DARPA will apply publication or other restrictions, as necessary, if it determines that the research resulting from the proposed effort will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any award resulting from such a determination will include a requirement for DARPA permission before publishing any information or results on the program. For more information on publication restrictions, see the section below on Fundamental Research.

B. Fundamental Research

It is DoD policy that the publication of products of fundamental research will remain unrestricted to the maximum extent possible. National Security Decision Directive (NSDD) 189 established the national policy for controlling the flow of scientific, technical, and engineering information produced in federally funded fundamental research at colleges, universities, and laboratories. The Directive defines fundamental research as follows:

'Fundamental research' means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.

As of the date of publication of this RA, the Government expects that program goals as described herein may be met by proposers intending to perform fundamental research. The Government does not anticipate applying publication restrictions of any kind to individual awards for fundamental research that may result from this RA. Notwithstanding this statement of expectation, the Government is not prohibited from considering and selecting research proposals that, while perhaps not qualifying as fundamental research under the foregoing definition, still meet the RA criteria for submissions. If proposals are selected for award that offer other than a fundamental research solution, the Government will either work with the proposer to modify the proposed statement of work to bring the research back into line with fundamental research or else the proposer will agree to restrictions in order to receive an award.

Proposers should indicate in their proposal whether they believe the scope of the research included in their proposal is fundamental or not. While proposers should clearly explain the intended results of their research, the Government shall have sole discretion to select award instrument type and to negotiate all instrument terms and conditions with selectees. Appropriate clauses will be included in resultant awards for non-fundamental research to prescribe publication requirements and other restrictions, as appropriate.

For certain research projects, it may be possible that although the research being performed by the prime contractor is restricted research, a subawardee may be conducting fundamental

research. In those cases, it is the prime contractor's responsibility to explain in its proposal why its subawardee's effort is fundamental research.

The following statement or similar provision will be incorporated into any resultant non-fundamental research procurement contract or other transaction:

There shall be no dissemination or publication, except within and between the contractor and any subawardees, of information developed under this contract or contained in the reports to be furnished pursuant to this contract without prior written approval of DARPA's Public Release Center (DARPA/PRC). All technical reports will be given proper review by appropriate authority to determine which Distribution Statement is to be applied prior to the initial distribution of these reports by the contractor. With regard to subawardee proposals for Fundamental Research, papers resulting from unclassified fundamental research are exempt from prepublication controls and this review requirement, pursuant to DoD Instruction 5230.27 dated October 6, 1987.

When submitting material for written approval for open publication, the contractor/awardee must submit a request for public release to the DARPA/PRC and include the following information: (1) Document Information: document title, document author, short plain-language description of technology discussed in the material (approx. 30 words), number of pages (or minutes of video) and document type (e.g., briefing, report, abstract, article, or paper); (2) Event Information: event type (conference, principal investigator meeting, article or paper), event date, desired date for DARPA's approval; (3) DARPA Sponsor: DARPA Program Manager, DARPA office, and contract number; and (4) Contractor/Awardee's Information: POC name, email and phone. Allow four weeks for processing; due dates under four weeks require a justification. Unusual electronic file formats may require additional processing time. Requests may be sent either via email to public_release_center@darpa.mil or by mail at 675 North Randolph Street, Arlington VA 22203-2114, telephone (571) 218-4235. Refer to the following for link for information about DARPA's public release process: <http://www.darpa.mil/work-with-us/contract-management/public-release>."

III. Eligibility Information

A. Eligible Applicants

Participation is open to individuals who are U.S. Citizens, U.S. Permanent Residents, and Foreign Nationals at U.S. Institutions who meet the eligibility criteria listed below:

- Proposers must be Tenure Track Assistant/Associate Professors or their equivalent at non-profit research institutions.
- By the full proposal deadline of January 18, 2017, proposers must be within 8 years of their tenure-clock/appointment start date at a U.S. Institution, excluding any personal leaves of absence.
- Previous YFA Award recipients are not eligible for this or any future YFA program.

- Former DARPA Program Managers are not eligible to apply for funding under this program.
- Non-U.S. individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.
- PIs are limited to one executive summary and one full proposal submission to this RA; a proposer is strongly encouraged to submit an executive summary in advance of a full proposal to determine DARPA's interest and minimize the effort and expense of preparing an out of scope proposal.
- Recipients of non-YFA DARPA awards are eligible to propose. Proposers must provide a listing of federal support (past, current, and pending). This list must include the sponsor, amount, and performance dates of all federally-funded research efforts and should be present on the submission cover sheet as indicated in Section IV

There is no limit to the number of applications that can be submitted by an institution; however each submission must have a single principal investigator. Submissions to young investigator programs sponsored by other agencies are not restricted.

1. Federally Funded Research and Development Centers (FFRDCs) and Government Entities

Federally Funded Research and Development Centers (FFRDCs) and Government entities (e.g., Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations and cannot propose to this RA 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; and (2) FFRDCs must provide a letter on official letterhead from their sponsoring organization citing the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and their compliance with the associated FFRDC sponsor agreement's terms and conditions. This information is required for FFRDCs proposing to be prime contractors or subawardees. Government entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority and contractual authority, if relevant, establishing their ability to propose to Government solicitations. At the present time, DARPA does not consider 15 U.S.C. § 3710a to be sufficient legal authority to show eligibility. While 10 U.S.C. § 2539b may be the appropriate statutory starting point for some entities, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility. DARPA will consider FFRDC and Government entity eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

2. Foreign Participation

Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances.

B. Procurement Integrity, Standards of Conduct, Ethical Considerations, and Organizational Conflicts of Interest

Current federal employees are prohibited from participating in particular matters involving conflicting financial, employment, and representational interests (18 U.S.C. §§ 203, 205, and 208). Once the proposals have been received, and prior to the start of proposal evaluations, the Government will assess potential conflicts of interest and will promptly notify the proposer if any appear to exist. The Government assessment does NOT affect, offset, or mitigate the proposer's responsibility to give full notice and planned mitigation for all potential organizational conflicts, as discussed below.

Without prior approval or a waiver from the DARPA Director, in accordance with FAR 9.503, a contractor cannot simultaneously provide scientific, engineering, technical assistance (SETA) or similar support and also be a technical performer. As part of the proposal submission, all members of the proposed team (prime proposers, proposed subcontractors, and consultants) must affirm whether they (their organizations and individual team members) are providing SETA or similar support to any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the proposer, subcontractor, consultant, or individual supports and identify the prime contract number(s). All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. The disclosure must include a description of the action the proposer has taken or proposes to take to avoid, neutralize, or mitigate such conflict. If in the sole opinion of the Government after full consideration of the circumstances, a proposal fails to fully disclose potential conflicts of interest and/or any identified conflict situation cannot be effectively mitigated, the proposal will be rejected without technical evaluation and withdrawn from further consideration for award.

If a prospective proposer believes a conflict of interest exists or may exist (whether organizational or otherwise) or has questions on what constitutes a conflict of interest, the proposer should send his/her contact information and a summary of the potential conflict via email to the RA email address before time and effort are expended in preparing a proposal and mitigation plan.

C. Cost Sharing/Matching

Cost sharing is not required.

IV. Application and Submission Information

Prior to submitting a full proposal, proposers are *strongly encouraged* to first submit an executive summary as described below. This process allows a proposer to ascertain whether the proposed concept is: (1) applicable to the YFA RA and (2) currently of interest. For the purposes of this RA, applicability is defined as follows:

- The proposed concept is applicable to the technical and topic areas described herein.
- The proposed concept is important to DARPA's current investment portfolio.
- The proposed concept investigates an innovative approach that enables revolutionary advances, i.e., will not primarily result in evolutionary improvements to the existing state of practice.
- The proposed work has not already been completed (i.e., the research element is complete but manufacturing/fabrication funds are required).
- The proposer has not already received funding or a positive funding decision for the proposed concept (whether from DARPA or another Government agency).
- The proposer must meet the eligibility requirements outlined in Section III.

Executive summaries and full proposals that are not found to be applicable to the YFA RA as defined above may be deemed non-conforming¹ and removed from consideration. All executive summaries and full proposals must provide sufficient information to assess the validity/feasibility of their claims as well as comply with the requirements outlined herein for submission formatting, content and transmission to DARPA. Executive summaries and full proposals that fail to do so may be deemed non-conforming and removed from consideration. Proposers will be notified of non-conforming determinations via letter.

A. Address to Request Application Package

This document contains all information required to submit a response to this solicitation. No additional forms, kits, or other materials are needed except as referenced herein. No request for proposal or additional solicitation regarding this opportunity will be issued, nor is additional information available except as provided at the Federal Business Opportunities website (<http://www.fbo.gov>), the Grants.gov website (<http://www.grants.gov/>), or referenced herein.

B. Content and Form of Application Submission

1. Executive Summary Information

As stated above, proposers are *strongly encouraged* to submit an executive summary in advance of a full proposal to minimize effort and reduce the potential expense of preparing an out of scope proposal.

DARPA will respond to executive summaries with a statement as to whether DARPA is interested in the idea. Regardless of DARPA's response to an executive summary, proposers may submit a full proposal. DARPA will review all full proposals submitted using the published evaluation criteria and without regard to any comments resulting from the review of an executive summary.

¹ "Conforming" is defined as having been submitted in accordance with the requirements outlined herein.

Proposers to this solicitation may anticipate a response within approximately 30 days.

Executive Summaries must not be submitted to DARPA via email. See Section IV.E.1 for executive summary submission instructions.

a. Executive Summary Format

All proposers are required to use the template provided as Attachment 1 to this solicitation on www.fbo.gov and <http://www.grants.gov>. All pages shall be formatted for printing on 8-1/2 by 11 inch paper with 1-inch margins and font size not smaller than 12 point. Font sizes of 8 or 10 point may be used for figures, tables, and charts. Document files must be in .pdf, .ppt, .pptx, .odx, .doc, .docx, .xls, or .xlsx formats. Submissions must be written in English.

Abstracts shall not exceed a maximum of 1 page excluding the cover sheet and optional bibliography as shown in the table below.

Page limit includes:	Page limit does NOT include:
All figures, tables, charts	Cover Sheet
	Bibliography (optional), not exceed 2 pages

i. Cover Sheet: Provide the following information:

- RA number (DARPA-RA-16-63)
- Topic Area (choose one, only)
- Executive Summary Title
- Respondent Organization
- Technical point of contact (POC)/Principal Investigator (PI) including name, mailing address, telephone, and email address
- PI's Tenure-Track Start Date (or equivalent)
- PI's approved leaves of absence, if any
- Is the PI within the 8 year eligibility window? Yes/No
- Administrative POC including name, mailing address, telephone number, and email address
- Other Team Members (subcontractors and consultants), if any, including name, organization and organization type.
- Total Proposed Cost (Rough Order of Magnitude)
- Date Executive Summary was prepared
- List all federal awards and award applications (past, current, and pending)

Sections ii-viii should not exceed 1 page. Do not include any identifying information of the PI, Organization or Team Members in this page. Identifying information may be included on the Cover Sheet and Bibliography pages, only. Failure to anonymize sections ii-viii may result in the executive summary being determined non-conforming.

ii. Topic Area

iii. Executive Summary Title

iv. Summary of effort: Provide a one-two sentence summary about what you are trying to do and why does it matter. Please minimize jargon. (1-2 sentences)

v. Intro/Background: Describe the problem space you are trying to explore. (One paragraph)

- a. What is the problem you are trying to solve and why is it important?
- b. What is/are the current state of the art and what are the limitations to current approaches?

vi. Impact: Describe the impact your project will have within the field, community, and wider audience. (One short paragraph)

- a. If you succeed, what difference do you think it will make?
- b. How will the project impact your field?

vii. Methods/Approach: Identify and describe the scientific phenomena and/or engineering capability under consideration. Outline your research plan and summarize the methodologies you will be employing. Please incorporate the answers to the following questions within your description. (Up to remainder of page)

- a. What methodologies will you be employing?
- b. What is new about your approaches?
- c. What are the advantages of your proposed methodologies over existing ones?

viii. Bibliography (Optional): If desired, include a brief bibliography with *links* to relevant papers, reports, or resumes of key team members. The bibliography should not exceed 2 pages.

2. Full Proposal Information

Proposals consist of Volume 1: Technical and Management Volume (including mandatory subsection xiv - Administrative and National Policy Requirements); and Volume 2: Cost Volume.

All proposers are required to use the proposal templates provided as Attachment 2, Attachment 3, and Attachment 4 to this solicitation on www.fbo.gov and <http://www.grants.gov>. Attachment 2 is for the Volume 1: Technical and Management Volume and Attachment 3 is for Volume 2: Cost Volume. Attachment 4 is for the Executive Summary Slide.

Proposers are encouraged to submit concise, but descriptive, proposals. Specific examples of problems, approaches, or goals are preferred to qualitative generalities. The Government will not consider pages in excess of the page count limitation, as described herein. Proposals with fewer than the maximum number of pages will not be penalized. Information incorporated into the Cost Volume which is not related to cost will not be considered. Additional information not explicitly called for in the Technical and Management Volume must not be submitted with the proposal, but may be included as links in the bibliography. Such materials will be considered for

the reviewers' convenience only and not evaluated as part of the proposal.

All pages in both the Technical and Management Volume and the Cost Volume shall be formatted for printing on 8-1/2 by 11-inch paper with 1-inch margins, single-line spacing, and a font size not smaller than 12 point. Font sizes of 8 or 10 point may only be used for figures, tables, and charts in the Technical and Management Volume. Document files must be in .pdf, .odx, .ppt, .pptx, .doc, .docx, .xls, or .xlsx formats. Submissions must be written in English.

Proposals not meeting the format prescribed herein may not be reviewed.

a. Volume 1: Technical and Management Proposal

Volume 1 shall not exceed a maximum of 8 pages excluding the items listed in the table below. All proposers are required to use the Volume 1: Technical and Management Volume template provided as Attachment 2 and the Executive Summary Slide provided as Attachment 4 to this solicitation on www.fbo.gov and <http://www.grants.gov>.

Page limit includes:	Page limit does NOT include:
Technical figures, tables, charts	Cover Sheet
	Official transmittal letter
	Executive Summary Slide
	Table of Contents
	Administrative and National Policy Requirements (mandatory)
	Bibliography (not to exceed 2 pages)

Volume 1 must include the following components:

i. Cover Sheet: Include the following information.

- Label: “Proposal: Volume 1 – Technical and Management Volume”
- RA number (DARPA-RA-16-63)
- Topic Area (choose one, only)
- Proposal title
- Proposer’s internal reference number, if any
- Lead organization (prime)
- Type of organization, selected from the following categories: Historically Black Colleges and Universities (HBCU), Minority Institution (MI), Other Educational, or Other Nonprofit
- Technical point of contact (POC)/Principal Investigator (PI) including name, mailing address, telephone, and email address
- PI’s Tenure Track Start Date (or equivalent)
- PI’s Approved Leaves of Absence, if any
- Is the PI within the 8 year eligibility window?
- Administrative POC including name, mailing address, telephone number, and email address

- Total proposed cost separated by base award and Director’s Fellowship option, if proposed
- Award Instrument Requested (Grants only)
- Place(s) of performance
- Period(s) of performance
- List all other team members (subcontractors and consultants), including Technical POC name, organization, organization type, and if they are YFA eligible
- Date proposal was prepared
- Proposal validity period (minimum 120 days)
- List all federal awards and award applications (past, current, and pending).

ii. Table of Contents

iii. Official Transmittal Letter

iv. Executive Summary Slide: All proposers are required to use the Executive Summary Slide template provided as Attachment 4 to this solicitation on www.fbo.gov and <http://www.grants.gov>. Provide a one slide summary in PowerPoint that effectively and succinctly conveys the main objective, key innovations, expected impact, and other unique aspects of the proposed project.

v. Executive Summary: Provide a synopsis of the proposed project, including answers to the following questions:

- What is the proposed work attempting to accomplish or do?
- How is it done today, and what are the limitations?
- Who or what will be affected and what will be the impact if the work is successful?
- How much will it cost, and how long will it take?

The summary should include a description of the key technical challenges, a concise review of the technologies proposed to overcome these challenges and achieve the project’s goal, and a clear statement of the novelty and uniqueness of the proposed work.

vi. Goals and Impact: Describe what the proposed team is trying to achieve and the difference it will make (qualitatively and quantitatively) if successful. Describe the innovative aspects of the project in the context of existing capabilities and approaches, clearly delineating the uniqueness and benefits of this project in the context of the state of the art, alternative approaches, and other projects from the past and present. Describe how the proposed project is revolutionary and how it significantly rises above the current state of the art.

Describe the deliverables associated with the proposed project and any plans to commercialize the technology, transition it to a customer, or further the work. Discuss the mitigation of any issues related to sustainment of the technology over its entire

lifecycle, assuming the technology transition plan is successful.

vii. Technical Plan: Outline and address technical challenges inherent in the approach and possible solutions for overcoming potential problems. Demonstrate a deep understanding of the technical challenges and present a credible (even if risky) plan to achieve the project's goal. Discuss mitigation of technical risk. Provide appropriate measurable milestones (quantitative if possible) at intermediate stages of the project to demonstrate progress, and a plan for achieving the milestones. List Government-furnished materials or data assumed to be available.

viii. Management Plan: Provide a summary of expertise of the proposed team, including any subcontractors/consultants and key personnel who will be executing the work. Identify a principal investigator (PI) for the project. Provide a clear description of the team's organization including an organization chart that includes, as applicable, the relationship of team members; unique capabilities of team members; task responsibilities of team members; teaming strategy among the team members; and key personnel with the amount of effort to be expended by each person during the project. Provide a detailed plan for coordination including explicit guidelines for interaction among collaborators/subcontractors of the proposed project. Include risk management approaches. Describe any formal teaming agreements that are required to execute this project.

ix. Personnel, Qualifications, and Commitments: List key personnel (no more than one page per person), showing a concise summary of their qualifications, discussion of previous accomplishments, and work in this or closely related research areas. Indicate the level of effort in terms of hours to be expended by each person during each contract year and other (current and proposed) major sources of support for them and/or commitments of their efforts. DARPA expects all key personnel associated with a proposal to make substantial time commitment to the proposed activity and the proposal will be evaluated accordingly. It is DARPA's intention to put key personnel conditions into the awards, so proposers should not propose personnel that are not anticipated to execute the work.

x. Capabilities: Describe organizational experience in relevant subject area(s), existing intellectual property, or specialized facilities. Discuss any work in closely related research areas and previous accomplishments. Identify other solicitation(s) to which this concept has been proposed. If applicable, state whether funding or a positive funding decision has already been received, and from which agency.

xi. Statement of Work (SOW): The SOW must provide a detailed task breakdown, citing specific tasks and their connection to the interim milestones and metrics, as applicable. Each year of the project should be separately defined. The SOW must not include proprietary information. For each defined task/subtask, provide:

- A general description of the objective.
- A detailed description of the approach to be taken to accomplish each defined

task/subtask (including, where applicable, identifying the tasks/subtasks that will be performed on campus at a university).

- Identification (by name) of the primary organization (prime contractor, subcontractor(s), consultant(s)) responsible for task/subtask execution.
- A measurable milestone (e.g., a deliverable, demonstration, or other event/activity that marks task completion).
- A definition of all deliverables (e.g., data, reports, software) to be provided to the Government in support of the proposed tasks/subtasks.

xii. Schedule and Milestones: Provide a detailed schedule showing tasks (task name, duration, work breakdown structure element as applicable, performing organization), milestones, and the interrelationships among tasks. The task structure must be consistent with that in the SOW. Measurable milestones should be clearly articulated and defined in time relative to the start of the project.

xiii. Cost Summary: Provide the cost summary as described in Section IV.B.2.b.ii.(1).

xiv. Administrative and National Policy Requirements: This section is mandatory and must include ALL of the following components. If a particular subsection is not applicable, state “NONE” (i.e., do not delete the subsection or leave it blank).

- (1). **Team Member Identification:** Provide a list of all team members including the prime, subcontractor(s), and consultant(s), as applicable. Identify specifically whether any are a non-US organization or individual, FFRDC and/or Government entity. Use the following format for this list:

Prime			
Individual Name:	Organization:	Non-U.S. Organization:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Non-U.S. Individual:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		FFRDC:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		U.S. Government Entity:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Subcontractors/Consultants			
Individual Name:	Organization:	Non-U.S. Organization:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Non-U.S. Individual:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		FFRDC:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		U.S. Government Entity:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Individual Name:	Organization:	Non-U.S. Organization:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		Non-U.S. US Individual:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		FFRDC:	<input type="checkbox"/> Yes <input type="checkbox"/> No
		U.S. Government Entity:	<input type="checkbox"/> Yes <input type="checkbox"/> No

- (2). **Government or FFRDC Team Member Proof of Eligibility to Propose:** If any of the team member organizations are a Government entity or FFRDC, provide documentation (per Section III.A.1) citing the specific authority that establishes the applicable team member’s eligibility to propose to Government solicitations to include: (1) statutory authority; (2) contractual authority; (3) supporting regulatory guidance; and (4) evidence of agency approval for applicable team member participation.

- (3). Government or FFRDC Team Member Statement of Unique Capability:** If any of the team member organizations are a Government entity or FFRDC, provide a statement (per Section III.A.1) that demonstrates the work to be performed by the Government entity or FFRDC team member is not otherwise available from the private sector.
- (4). Organizational Conflict of Interest Affirmations and Disclosure:** If none of the proposed team members is currently providing SETA or similar support as described in Section III.B, state “NONE.”

If any of the proposed team members (individual or organization) is currently performing SETA or similar support, provide the following information:

Prime Contract Number	DARPA Office supported	Description of any action the proposer has taken or proposes to take to avoid, neutralize, or mitigate the conflict

- (5). Intellectual Property (IP):** If no IP restrictions are intended, state “NONE.” The Government will assume unlimited rights to all IP not explicitly identified as restricted in the proposal.

For all technical data or computer software that will be delivered to the Government with other than unlimited rights, provide (per Section VI.B.1) a list describing all proprietary claims to results, prototypes, deliverables or systems supporting and/or necessary for the use of the research, results, prototypes and/or deliverables. Provide documentation proving ownership or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) to be used for the proposed project. Use the following format for these lists:

NONCOMMERCIAL				
Technical Data and/or Computer Software To be Delivered With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions

COMMERCIAL				
Technical Data and/or Computer Software To be Delivered With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions

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(6). Human Subjects Research (HSR): If HSR is not a factor in the proposal, state “NONE.”

If the proposed work will involve human subjects, provide evidence of or a plan for review by an institutional review board (IRB). For further information on this subject, see Section VI.B.2.

(7). Animal Use: If animal use is not a factor in the proposal, state “NONE.”

If the proposed research will involve animal use, provide a brief description of the plan for Institutional Animal Care and Use Committee (IACUC) review and approval. For further information on this subject, see Section VI.B.3.

(8). Representations Regarding Unpaid Delinquent Tax Liability or a Felony Conviction under Any Federal Law: Per Section VI.B.7, complete the following statements.

(a) The proposer represents that it is 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 proposer represents that it is is not a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

xv. Bibliography: If desired, include a brief bibliography (not to exceed 2 pages) with links to relevant papers, reports, or resumes. Do not include technical papers. This section is optional, and the linked materials will not be evaluated as part of the proposal review.

b. Volume 2 - Cost Proposal

All proposers are required to use the Volume 2: Cost Volume template provided as Attachment 3 to this solicitation on www.fbo.gov and <http://www.grants.gov>. This volume is mandatory and must include all the listed components. No page limit is specified for this volume. The Cost Proposal shall be formatted for printing on 8-1/2 by 11-inch paper with 1-inch margins, single-line spacing, and a font size not smaller than 12 point for all document files. Submissions must be written in English.

The cost proposal should include a spreadsheet file (.xls or equivalent format) that addresses the applicable cost information requested below and provides formula traceability among all components of the cost proposal. The spreadsheet file must be included as a separate file in the full proposal package. Costs must be traceable between the prime proposer and all subcontractors/consultants, as well as between the cost proposal and the SOW. This includes

ensuring a consistent task structure across all proposal documents. Cost information must be provided in sufficient detail to substantiate the proposed prices.

i. Cover Sheet:

- Label: “Proposal: Volume 2 – Cost Volume”
- RA number (DARPA-RA-16-63)
- Topic Area (choose one, only)
- Proposal title
- Proposer’s internal reference number, if any
- Lead organization (prime)
- Type of organization, selected from the following categories: HBCU, MI, Other Educational, or Other Nonprofit
- Technical point of contact (POC)/Principal Investigator (PI) including name, mailing address, telephone, and email address
- Administrative POC including name, mailing address, telephone number, and email address
- Total proposed cost separated by base award and Director’s Fellowship option, if proposed
- Award instrument requested (grants only)
- Place(s) of performance
- Period(s) of performance
- List all other team member(s) (subcontractors and consultants), if any; for each, provide the Technical POC name and organization
- Data Universal Numbering System (DUNS) number²
- Taxpayer identification number (TIN)³
- Commercial and Government Entity (CAGE) code⁴
- Name, address, and telephone number of the proposer’s cognizant Defense Contract Management Agency (DCMA) administration office⁵ or Office of Naval Research (ONR) administration office⁶, if known
- Name, address, and telephone number of the proposer’s cognizant Defense Contract Audit Agency (DCAA) audit office⁷, if applicable
- Date proposal was prepared
- Proposal validity period (minimum 120 days)

² The DUNS number is used as the Government's contractor identification code for all procurement-related activities. Go to <http://fedgov.dnb.com/webform/index.jsp> to request a DUNS number (may take at least one business day). See Section VI.B.5 for further information.

³ See <http://www.irs.gov/businesses/small/international/article/0,,id=96696,00.html> for information on requesting a TIN. Note, requests may take from 1 business day to 1 month depending on the method (online, fax, mail).

⁴ A CAGE Code identifies companies doing or wishing to do business with the Federal Government. See Section VI.B.5 for further information.

⁵ <https://pubapp.dcma.mil/CASD/CasdSearch.do>.

⁶ <http://www.onr.navy.mil/Contracts-Grants/Regional-Contacts.aspx>.

⁷ http://www.dcaa.mil/FAQs_Contractor.pdf.

ii. Cost Summaries

(1) Cost Summary by Year: Provide total effort cost by Government Fiscal Year (GFY) broken down by major cost items to include: labor costs, materials, travel, consultants, subcontracts, other direct charges (ODCs), indirect costs (overhead, fringe, general and administrative (G&A)), and any proposed fee for the project.

(2) Cost Summary by Task: Provide a summary of total effort costs by task.

(3) Cost Summary by Month: Provide a summary of projected funding requirements by month.

iii. Cost Details: Provide the following cost details broken down by month and Government Fiscal Year (GFY). Include supporting documentation describing the method used to estimate costs.

(1) Direct Labor: Provide individual labor categories or persons, with associated labor hours and direct labor rates.

(2) Indirect Costs: Identify all indirect cost rates (Fringe Benefits, Overhead, G&A, Facilities Cost of Money, etc.) and the basis for each.

(3) Materials: Provide an itemized list of all proposed materials including quantities, unit prices, proposed vendors (if known), and the basis of estimate (e.g., quotes, prior purchases, catalog price lists, etc.). Any item that exceeds \$5,000 must be supported with back-up documentation such as a copy of catalog price lists or quotes prior to purchase.

(4) Equipment Purchases: Provide an itemized list of all proposed equipment including quantities, unit prices, proposed vendors (if known) and the basis of estimate (e.g., quotes, prior purchases, catalog price lists, etc.). Any item that exceeds \$5,000 must be supported with back-up documentation such as a copy of catalog price lists or quotes prior to purchase. Include any requests for Government-furnished equipment or information with cost estimates and delivery dates.

(5) Travel: Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc.

(6) ODCs: Provide an itemized breakdown with costs. Backup documentation must be submitted to support proposed costs. An explanation of any estimating factors, including their derivation and application, must be provided.

(7) Cost Sharing: Provide the source, nature, and amount of any industry cost-sharing.

(8) Consultant Costs: Provide a copy of all consultants' proposed SOWs as well as signed consultant agreements or other documents which verify the proposed loaded daily / hourly rate, hours and any other proposed consultant costs (e.g., travel).

(9) Subcontractor Costs: Provide information requested above in subsections (1)-(7) for each proposed subcontractor. *All documentation must be prepared at the same level of detail as that required of the prime.* In addition, prime proposers must provide the following for all proposed subcontractors, as applicable:

- A copy of the proposed SOW as well as any documents which verify the proposed loaded daily / hourly rate, hours and any other proposed costs (e.g., travel).
- interdivisional work transfer agreements or evidence of similar arrangements; and
- A cost or price reasonableness analysis of proposed subcontractor prices as defined in FAR 15.404-3. Such analysis shall indicate the extent to which the prime contractor has negotiated subcontract prices.

The prime proposer is responsible for the compilation and submission of all non-proprietary subcontractor cost proposals. Proposal submissions will not be considered complete until the Government has received all subcontractor cost proposals.

Proprietary subcontractor cost proposals may be included as part of Volume 2 or emailed separately (by the subcontractor) to YFA2017@darpa.mil. Email messages must include "Subcontractor Cost Proposal" in the subject line and identify the principal investigator, prime proposer organization and proposal title in the body of the message.

iv. Rate Agreements: Provide any available approved rate information or documentation that may assist in expediting negotiations (e.g., Forward Pricing Rate Agreement, Department of Health and Human Services (DHHS) or Office of Naval Research (ONR) rate agreements).

3. Proprietary and Security Information

DARPA policy is to treat all submissions as source selection information (see FAR 2.101 and 3.104), and to disclose their contents only for the purpose of evaluation. Restrictive notices notwithstanding, during the evaluation process, submissions may be handled by support contractors for administrative purposes and/or to assist with technical evaluation. All DARPA support contractors performing this role are expressly prohibited from performing DARPA-sponsored technical research and are bound by appropriate nondisclosure agreements.

Submissions will not be returned. The original of each submission received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested, provided the formal request is received at this office within 5 days after unsuccessful notification.

a. Proprietary Information

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked with a label such as “Proprietary” or “Company Proprietary.” Note, “Confidential” is a classification marking used to control the dissemination of U.S. Government National Security Information as dictated in Executive Order 13526 and should not be used to identify proprietary business information.

b. Security Information

Classified submissions shall be transmitted in accordance with the following guidance. Additional information on the subjects discussed in this section may be found at <http://www.dss.mil/>.

If a submission contains Classified National Security Information as defined by Executive Order 13526, the information must be appropriately and conspicuously marked with the proposed classification level and declassification date. Similarly, when the classification of a submission is in question, the submission must be appropriately and conspicuously marked with the proposed classification level and declassification date. Submissions requiring DARPA to make a final classification determination shall be marked as follows:

“CLASSIFICATION DETERMINATION PENDING. Protect as though classified _____ (insert the recommended classification level, e.g., Top Secret, Secret or Confidential)”

NOTE: Classified submissions must indicate the classification level of not only the submitted materials, but also the classification level of the anticipated award.

Proposers submitting classified information must have, or be able to obtain prior to contract award, cognizant security agency approved facilities, information systems, and appropriately cleared/eligible personnel to perform at the classification level proposed. All proposer personnel performing Information Assurance (IA)/Cybersecurity related duties on classified Information Systems shall meet the requirements set forth in DoD Manual 8570.01-M (Information Assurance Workforce Improvement Program).

Proposers choosing to submit classified information from other collateral classified sources (i.e., sources other than DARPA) must ensure: (1) they have permission from an authorized individual at the cognizant Government agency (e.g., Contracting Officer, Program Manager); (2) the proposal is marked in accordance with the source Security Classification Guide (SCG) from which the material is derived; and (3) the source SCG is submitted along with the proposal.

DARPA anticipates that submissions received under this RA will be unclassified. However, should a proposer wish to submit classified information, an *unclassified* email must be sent

to the RA mailbox requesting submission instructions from the DARPA/DSO Program Security Officer (PSO).

Security classification guidance and direction via a SCG and/or DD Form 254, "DoD Contract Security Classification Specification," will not be provided at this time, since DARPA is soliciting ideas only. If a determination is made that the award instrument may result in access to classified information, a SCG and/or DD Form 254 will be issued by DARPA and attached as part of the award.

Confidential and Secret Information

Use transmission, classification, handling, and marking guidance provided by previously issued SCGs, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual, including the Supplement Revision 1, (DoD 5220.22-M and DoD 5200.22-M Sup. 1) when submitting Confidential and/or Secret classified information.

Confidential and Secret classified information may be submitted via ONE of the two following methods:

- Hand-carried by an appropriately cleared and authorized courier to the DARPA CDR. Prior to traveling, the courier shall contact the DARPA Classified Document Registry (CDR) at 703-526-4052 to coordinate arrival and delivery.

OR

- Mailed via U.S. Postal Service (USPS) Registered Mail or USPS Express Mail. All classified information will be enclosed in opaque inner and outer covers and double-wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee.

The inner envelope shall be addressed to:

Defense Advanced Research Projects Agency
ATTN: DARPA-RA-16-63
675 North Randolph Street
Arlington, VA 22203-2114

The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

Defense Advanced Research Projects Agency
Security & Intelligence Directorate, Attn: CDR
675 North Randolph Street
Arlington, VA 22203-2114

Top Secret Information

Use classification, handling, and marking guidance provided by previously issued SCGs, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual, including the Supplement Revision 1, (DoD 5220.22-M and DoD 5200.22-M Sup. 1). Top Secret information must be hand-carried by an appropriately cleared and authorized courier to the DARPA CDR. Prior to traveling, the courier shall contact the DARPA CDR at 703-526-4052 to coordinate arrival and delivery.

Sensitive Compartmented Information (SCI)

SCI must be marked, managed and transmitted in accordance with DoDM 5105.21 Volumes 1 - 3. Questions regarding the transmission of SCI may be sent to the DARPA/DSO PSO via the RA mailbox or by contacting the DARPA Special Security Officer (SSO) at 703-812-1970.

Successful proposers may be sponsored by DARPA for access to SCI. Sponsorship must be aligned to an existing DD Form 254 where SCI has been authorized. Questions regarding SCI sponsorship should be directed to the DARPA Personnel Security Office at 703-526-4543.

Special Access Program (SAP) Information

SAP information must be marked in accordance with DoDM 5205.07 Volume 4 and transmitted by specifically approved methods which will be provided by the DARPA/DSO PSO.

Proposers choosing to submit SAP information from an agency other than DARPA are required to provide the DARPA/DSO Program Security Officer (PSO) written permission from the source material's cognizant Special Access Program Control Officer (SAPCO) or designated representative. For clarification regarding this process, contact the DARPA/DSO PSO via the RA mailbox or the DARPA SAPCO at 703-526-4102.

Additional SAP security requirements regarding facility accreditations, information security, personnel security, physical security, operations security, test security, classified transportation plans, and program protection planning may be specified in the DD Form 254.

NOTE: prior to drafting the submission, if use of SAP Information Systems is to be proposed, proposers must first obtain an Authorization-to-Operate from the DARPA/DSO PSO (or other applicable DARPA Authorization Official) using the Risk Management Framework (RMF) process outlined in the Joint Special Access Program (SAP) Implementation Guide (JSIG), Revision 3, dated October 9, 2013 (or successor document).

C. Submission Dates and Times

All times listed herein are in Eastern Time. Proposers are warned that submission deadlines as outlined herein are strictly enforced. When planning their response to this solicitation, proposers should take into account that some parts of the submission process may take from one business

day to one month to complete (e.g., registering for a DUNS number or TIN).

NOTE: Proposers submitting an executive summary or full proposal via the DARPA BAA Submission site (<https://baa.darpa.mil/>), MUST click the “Finalize” button with sufficient time for the upload to complete prior to the deadline. Failure to do so will result in a late submission.

DARPA will acknowledge receipt of complete submissions via email and assign identifying numbers that should be used in all further correspondence regarding those submissions. If no confirmation is received within two business days, please contact the RA Administrator at YFA2017@darpa.mil to verify receipt.

Failure to comply with the submission procedures outlined herein may result in the submission not being evaluated.

1. Executive Summaries

Executive summaries must be submitted per the instructions outlined herein *and received by DARPA* no later than 4:00 p.m. on November 1, 2016. Executive summaries received after this time and date may not be reviewed.

2. Full Proposals

The proposal package--full proposal (Volumes 1 and 2) and, as applicable, proprietary subcontractor cost proposals, classified appendices to unclassified proposals-- must be submitted per the instructions outlined herein *and received by DARPA* no later than 4:00 p.m. on January 18, 2017. Proposals received after this time and date may not be reviewed.

D. Funding Restrictions

Not applicable.

E. Other Submission Requirements

1. Unclassified Submission Instructions

Proposers must submit all parts of their submission package using the same method; submissions cannot be sent in part by one method and in part by another method nor should duplicate submissions be sent by multiple methods. Email submissions will not be accepted.

a. Executive Summaries

DARPA/DSO will employ an electronic upload submission system (<https://baa.darpa.mil/>) for all UNCLASSIFIED executive summaries sent in response to this solicitation. *Executive summaries must not be submitted via Grants.gov.*

First time users of the DARPA BAA Submission website must complete a two-step account creation process. The first step consists of registering for an extranet account by going to the URL listed above and selecting the “Account Request” link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, the second step

requires proposers to go back to the submission website and log in using that user name and password. After accessing the extranet, proposers may then create a user account for the DARPA BAA Submission website by selecting the “Register your Organization” link at the top of the page. Once the user account is created, proposers will be able to see a list of solicitations open for submissions, view submission instructions, and upload/finalize their executive summary.

Proposers who already have an account on the DARPA BAA Submission website may simply log in at <https://baa.darpa.mil/>, select this solicitation from the list of open DARPA solicitations and proceed with their executive summary submission. Note: proposers who have created a DARPA RA Submission website account to submit to another DARPA Technical Office’s solicitations do not need to create a new account to submit to this solicitation.

All executive summaries submitted electronically through the DARPA BAA Submission website must meet the following requirements: (1) uploaded as a zip file (.zip or .zipx extension); (2) only contain the document(s) requested herein; (3) only contain unclassified information; and (4) must not exceed 100 MB in size. Only one zip file will be accepted per executive summary and executive summaries not uploaded as zip files will be rejected by DARPA.

Technical support for the DARPA BAA Submission website is available during regular business hours, Monday – Friday, 9:00 a.m. – 5:00 p.m. Requests for technical support must be emailed to BAAT_Support@darpa.mil with a copy to YFA2017@darpa.mil. Questions regarding submission contents, format, deadlines, etc. should be emailed to YFA2017@darpa.mil. Questions/requests for support sent to any other email address may result in delayed/no response.

Since proposers may encounter heavy traffic on the web server, proposers should not wait until the day executive summaries are due to request an account and/or upload the submission.

b. Proposals Requesting a Grant

Proposers requesting grants may submit proposals through one of the following methods: (1) electronic upload per the instructions at <http://www.grants.gov/applicants/apply-for-grants.html>; or (2) hard copy mailed directly to DARPA. Grant proposals may not be submitted through any other means. If proposers intend to use Grants.gov as their means of submission, then they must submit their entire proposal through Grants.gov; applications cannot be submitted in part to Grants.gov and in part as a hard-copy. Proposers using the Grants.gov do not submit paper proposals in addition to the Grants.gov electronic submission.

Direct Mail/Hand-carry:

Proposers electing to submit grant proposals via direct mail must provide one paper copy and one electronic copy on CD or DVD of the full proposal package. Proposals must include a completed SF 424 R&R form (Application for Federal Assistance, Research and Related)

available on the Grants.gov website

http://apply07.grants.gov/apply/forms/sample/RR_SF424_2_0-V2.0.pdf. All parts of the proposal package must be mailed or hand-carried to the address noted in Section VII below.

Electronic Upload:

DARPA encourages grant proposers to submit their proposals via electronic upload at <http://www.grants.gov/web/grants/applicants/apply-for-grants.html>. Proposers electing to use this method must complete a one-time registration process on Grants.gov before a proposal can be electronically submitted. *If proposers have not previously registered, this process can take between three business days and four weeks if all steps are not completed in a timely manner.* See the Grants.gov user guides and checklists at <http://www.grants.gov/web/grants/applicants/applicant-resources.html> for registration requirements and instructions.

Carefully follow the DARPA submission instructions provided with the solicitation application package on Grants.gov. Only the required forms listed therein (e.g., SF-424 and Attachments form) should be included in the submission. *Please note that Grants.gov does not accept zipped or encrypted proposals.*

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) the proposal has been received by Grants.gov; and (2) the proposal has been either validated or rejected by the system. *It may take up to two business days to receive these emails.* If the proposal is validated, then the proposer has successfully submitted their proposal. If the proposal is rejected, the submission must be corrected, resubmitted and revalidated before DARPA can retrieve it. If the solicitation is no longer open, the rejected proposal cannot be resubmitted. Once the proposal is retrieved by DARPA, Grants.gov will send a third email to notify the proposer.

Technical support for Grants.gov submissions may be reached at 1-800-518-4726 or support@grants.gov.

To avoid missing deadlines, proposers should submit their proposals to Grants.gov in advance of the proposal due date, with sufficient time to complete the registration and submission process, receive email notifications and correct errors, as applicable.

V. Application Review Information

A. Evaluation Criteria

Proposals will be evaluated using the following criteria listed in descending order of importance: Overall Scientific and Technical Merit; Potential Contribution and Relevance to the DARPA Mission; and Cost Realism.

- *Overall Scientific and Technical Merit*

The proposed technical approach is feasible, achievable, complete and supported by a proposed technical team that has the expertise and experience to accomplish the proposed tasks.

The task descriptions and associated technical elements provided are complete and in a logical sequence with all proposed deliverables clearly defined such that a final outcome that achieves the goal can be expected as a result of award. The proposal identifies major technical risks and planned mitigation efforts are clearly defined and feasible.

- *Potential Contribution and Relevance to the DARPA Mission*

The potential contributions of the proposed effort are relevant to the national technology base. Specifically, DARPA's mission is to maintain the technological superiority of the U.S. military and prevent technological surprise from harming national security by sponsoring revolutionary, high-payoff research that bridges the gap between fundamental discoveries and their application.

The proposed intellectual property restrictions (if any) will not significantly impact the Government's ability to transition the technology

- *Cost Realism*

The proposed costs are realistic for the technical and management approach and accurately reflect the technical goals and objectives of the solicitation. The proposed costs are consistent with the proposer's Statement of Work and reflect a sufficient understanding of the costs and level of effort needed to successfully accomplish the proposed technical approach. The costs for the prime proposer and proposed subawardees are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs).

B. Proposal Review and Selection Process

The review process identifies proposals that meet the evaluation criteria described above and are, therefore, selectable for negotiation of awards by the Government. DARPA policy is to ensure impartial, equitable, comprehensive proposal evaluations and to select proposals that meet DARPA technical, policy, and programmatic goals. If necessary, panels of experts in the appropriate areas will be convened. As described in Section IV, proposals must be deemed conforming to the solicitation to receive a full technical review against the evaluation criteria; proposals deemed non-conforming will be removed from consideration.

DARPA will conduct a scientific/technical review of each conforming proposal. Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

Conforming proposals based on a previously submitted executive summary will be reviewed without regard to feedback resulting from review of that executive summary. Furthermore, a

favorable response to an executive summary is not a guarantee that a proposal based on the executive summary will ultimately be selected for award negotiation. Proposals that are determined selectable will not necessarily receive awards.

For evaluation purposes, a proposal is defined to be the document and supporting materials as described in Section IV.B.2. Input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants/experts who are strictly bound by the appropriate non-disclosure requirements. No submissions, classified or unclassified, will be returned.

VI. Award Administration Information

A. Selection Notices

After proposal evaluations are complete, proposers will be notified as to whether their proposal was selected for award negotiation as a result of the review process. Notification will be sent by email to the Technical and Administrative POCs identified on the proposal cover sheet. If a proposal has been selected for award negotiation, the Government will initiate those negotiations following the notification.

B. Administrative and National Policy Requirements

The following administrative and national policy requirements apply to grants.

1. Intellectual Property

Proposers should note that the Government does not own the intellectual property or technical data/computer software developed under Government contracts. The Government acquires the right to use the technical data/computer software. Regardless of the scope of the Government's rights, performers may freely use their same data/software for their own commercial purposes (unless restricted by U.S. export control laws or security classification). Therefore, technical data and computer software developed under this solicitation will remain the property of the performers, though DARPA will have, at a minimum, Government Purpose Rights (GPR) to technical data and computer software developed through DARPA sponsorship.

If proposers desire to use proprietary computer software or technical data or both as the basis of their proposed approach, in whole or in part, they should: (1) clearly identify such software/data and its proposed particular use(s); (2) explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and (3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost to the Government under the proposed proprietary solution. Proposers expecting to use, but not to deliver, commercial open source tools or other materials in implementing their approach may be required to indemnify the Government against legal liability arising from such use.

All references to "Unlimited Rights" or "Government Purpose Rights" are intended to refer to the definitions of those terms as set forth in the Defense Federal Acquisition Regulation Supplement (DFARS) 227.

a. Intellectual Property Representations

All proposers must provide a good faith representation of either ownership or possession of appropriate licensing rights to all other intellectual property to be used for the proposed project. Proposers must provide a short summary for each item asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

b. Patents

All proposers must include documentation proving ownership or possession of appropriate licensing rights to all patented inventions to be used for the proposed project. If a patent application has been filed for an invention, but it includes proprietary information and is not publicly available, a proposer must provide documentation that includes: the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and summary of the patent title, with either: (1) a representation of invention ownership; or (2) proof of possession of appropriate licensing rights in the invention (i.e., an agreement from the owner of the patent granting license to the proposer).

c. Other Types of Awards

Proposers responding to this solicitation requesting a grant shall follow the applicable rules and regulations governing those award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any intellectual property contemplated under those award instruments in question. This includes both noncommercial items and commercial items. The Government may use the list as part of the evaluation process to assess the impact of any identified restrictions, and may request additional information from the proposer, to evaluate the proposer's assertions. Failure to provide full information may result in a determination that the proposal is not compliant with the solicitation. A template for complying with this request is provided in Section IV.B.2.a.xiii.(5).

2. Human Subjects Research

All research selected for funding involving human subjects, to include use of human biological specimens and human data, must comply with the federal regulations for human subjects protection. Further, research involving human subjects that is conducted or supported by the DoD must comply with 32 CFR 219, *Protection of Human Subjects* (and DoD Instruction 3216.02, *Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research* (<http://www.dtic.mil/whs/directives/corres/pdf/321602p.pdf>)).

Institutions awarded funding for research involving human subjects must provide documentation of a current Assurance of Compliance with Federal regulations for human subjects protection, such as a Department of Health and Human Services, Office of Human Research Protection Federal Wide Assurance (<http://www.hhs.gov/ohrp>). All institutions engaged in human subjects research, to include subcontractors, must also hold a valid Assurance. In addition, all personnel

involved in human subjects research must provide documentation of completion of human subjects research training.

For all proposed research that will involve human subjects in the first year or phase of the project, the institution must provide evidence of or a plan for review by an Institutional Review Board (IRB) upon final proposal submission to DARPA as part of their proposal, prior to being selected for funding. The IRB conducting the review must be the IRB identified on the institution's Assurance of Compliance with human subjects protection regulations. The protocol, separate from the proposal, must include a detailed description of the research plan, study population, risks and benefits of study participation, recruitment and consent process, data collection, and data analysis. It is recommended that you consult the designated IRB for guidance on writing the protocol. The informed consent document must comply with federal regulations (32 CFR 219.116). A valid Assurance of Compliance with human subjects protection regulations along with evidence of completion of appropriate human subjects research training by all investigators and personnel involved with human subjects research should accompany the protocol for review by the IRB.

In addition to a local IRB approval, a headquarters-level human subjects administrative review and approval is required for all research conducted or supported by the DoD. The Army, Navy, or Air Force office responsible for managing the award can provide guidance and information about their component's headquarters-level review process. Note that confirmation of a current Assurance of Compliance with human subjects protection regulations and appropriate human subjects research training is required before headquarters-level approval can be issued.

The time required to complete the IRB review/approval process varies depending on the complexity of the research and the level of risk involved with the study. The IRB approval process can last between one and three months, followed by a DoD review that could last between three and six months. Ample time should be allotted to complete the approval process. DoD/DARPA funding cannot be used towards human subjects research until ALL approvals are granted.

3. Animal Use

Award recipients performing research, experimentation, or testing involving the use of animals shall comply with the rules on animal acquisition, transport, care, handling, and use as outlined in: (i) 9 CFR parts 1-4, Department of Agriculture rules that implement the Animal Welfare Act of 1966, as amended, (7 U.S.C. § 2131-2159); (ii) National Institutes of Health Publication No. 86-23, "Guide for the Care and Use of Laboratory Animals" (8th Edition); (iii) DoD Instruction 3216.01, "Use of Animals in DoD Programs."

For projects anticipating animal use, proposals should briefly describe plans for Institutional Animal Care and Use Committee (IACUC) review and approval. Animal studies in the program will be expected to comply with the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals, available at <http://grants.nih.gov/grants/olaw/olaw.htm>.

All award recipients must receive approval by a DoD-certified veterinarian, in addition to an IACUC approval. No animal studies may be conducted using DoD/DARPA funding until the

United States Army Medical Research and Materiel Command (USAMRMC) Animal Care and Use Review Office (ACURO) or other appropriate DoD veterinary office(s) grant approval. As a part of this secondary review process, the award recipient will be required to complete and submit an ACURO Animal Use Appendix, which may be found at https://mrmc-www.army.mil/index.cfm?pageid=Research_Protections.acuro&m=1.

4. Electronic and Information Technology

All electronic and information technology acquired through this solicitation must satisfy the accessibility requirements of Section 508 of the Rehabilitation Act (29 U.S.C. § 794d) and FAR 39.2. Each project involving the creation or inclusion of electronic and information technology must ensure that: (1) Federal employees with disabilities will have access to and use of information that is comparable to the access and use by Federal employees who are not individuals with disabilities; and (2) members of the public with disabilities seeking information or services from DARPA will have access to and use of information and data that is comparable to the access and use of information and data by members of the public who are not individuals with disabilities.

5. System for Award Management (SAM) Registration and Universal Identifier Requirements

Unless the proposer is exempt from this requirement, as per FAR 4.1102 or 2 CFR 25.110 as applicable, all proposers must be registered in the System for Award Management (SAM) and have a valid Data Universal Numbering System (DUNS) number prior to submitting a proposal. All proposers must maintain an active registration in SAM with current information at all times during which they have an active Federal award or proposal under consideration by DARPA. All proposers must provide the DUNS number in each proposal they submit.

Information on SAM registration is available at <https://www.sam.gov/portal/public/SAM/>.

Note that new registrations can take an average of 7-10 business days to process in SAM. SAM registration requires the following information:

- DUNS number
- TIN
- CAGE Code. If a proposer does not already have a CAGE code, one will be assigned during SAM registration.
- Electronic Funds Transfer information (e.g., proposer's bank account number, routing number, and bank phone or fax number).

6. Reporting Executive Compensation and First-Tier Subcontract Awards

An award term similar to FAR clause 52.204-10, "Reporting Executive Compensation and First-Tier Subcontract Awards," will be used in all grants.

7. Representations by Corporations Regarding an Unpaid Delinquent Tax Liability or a Felony Conviction under any Federal Law

The following representation will be included in all awards:

(a) In accordance with sections 744 and 745 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 11-235), none of the funds made available by this or any other Act may be used to enter into a contract with any corporation that —

(1) 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, where the awarding agency is aware of the unpaid tax liability, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government; or

(2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless the agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government.

(b) The Offeror represents that —

(1) It is [] 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,

(2) It is [] is not [] a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

Each proposer must complete and return the representations outlined in Section IV.B.2.a.xiv.(8). with their proposal submission.

8. Controlled Unclassified Information (CUI) on Non-DoD Information Systems

Controlled Unclassified Information (CUI) refers to unclassified information that does not meet the standards for National Security Classification but is pertinent to the national interests of the United States or to the important interests of entities outside the Federal Government and under law or policy requires protection from unauthorized disclosure, special handling safeguards, or prescribed limits on exchange or dissemination. All non-DoD entities doing business with DARPA are expected to adhere to the following procedural safeguards, in addition to any other relevant Federal or DoD specific procedures, for submission of any proposals to DARPA and any potential business with DARPA:

- Do not process DARPA CUI on publicly available computers or post DARPA CUI to publicly available webpages or websites that have access limited only by domain or Internet protocol restriction.
- Ensure that all DARPA CUI is protected by a physical or electronic barrier when not under direct individual control of an authorized user and limit the transfer of DARPA CUI to subcontractors or teaming partners with a need to know and commitment to this level of protection.
- Ensure that DARPA CUI on mobile computing devices is identified and encrypted and all communications on mobile devices or through wireless connections are protected and encrypted.
- Overwrite media that has been used to process DARPA CUI before external release or disposal.

9. Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements

(a) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Resolution Appropriations Act, 2015 (Pub. L. 113-235), Government agencies are not permitted to use funds appropriated (or otherwise made available) under that or any other Act for contracts with an entity that requires employees or subcontractors of such entity seeking to report fraud, waste, or abuse to sign internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or contractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(b) The prohibition in paragraph (a) of this provision does not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(c) *Representation.* By submission of its offer, the Offeror represents that it does not require employees or subcontractors of such entity seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or contractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

10. Publication of Grant Awards

Per Section 8123 of the Department of Defense Appropriations Act, 2015 (Division C of the Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. 113-235), all grant awards must be posted on a public website in a searchable format. To facilitate this task, proposers requesting grant awards must submit a maximum one (1) page abstract that may be publicly posted to comply with the requirement of Section 8123. This abstract should explain the project or program to the public and should only contain information that the proposer confirms is releasable to the public; **DO NOT INCLUDE ANY PROPRIETARY INFORMATION OR INFORMATION THAT CANNOT BE DISPLAYED ON A PUBLIC WEBSITE.** The proposer should sign the bottom of the abstract confirming the information in

the abstract is approved for public release. Proposers are advised to provide both a signed PDF copy, as well as an editable (e.g., Microsoft word) copy. Abstracts contained in grant proposals that are not selected for award will not be publicly posted.

C. Reporting

1. Technical and Financial Reports

The number and types of technical and financial reports required under the contracted project will be specified in the award document, and will include, as a minimum, monthly financial status reports and a yearly status summary. A final report that summarizes the project and tasks will be required at the conclusion of the performance period for the award. The reports shall be prepared and submitted in accordance with the procedures contained in the award document.

2. Representations and Certifications

In accordance with FAR 4.1201, prospective proposers shall complete electronic annual representations and certifications at <http://www.sam.gov>.

3. Wide Area Work Flow (WAWF)

Unless using another means of invoicing, performers will be required to submit invoices for payment directly at <https://wawf.eb.mil>. If applicable, WAWF registration is required prior to award under this solicitation.

4. i-Edison

Award documents will contain a requirement for patent reports and notifications to be submitted electronically through the i-Edison Federal patent reporting system at <https://public.era.nih.gov/iedison>.

VII. Agency Contacts

DARPA will use email for all technical and administrative correspondence regarding this solicitation.

- **Technical POC:** RA Coordinator, DARPA/DSO
- **Solicitation Email:** YFA2017@darpa.mil
- **Solicitation Mailing Address:**
DARPA/DSO
ATTN: DARPA-RA-16-63
675 North Randolph Street
Arlington, VA 22203-2114

- **DSO Solicitation Website:** <http://www.darpa.mil/work-with-us/opportunities>

VIII. Other Information

A. Frequently Asked Questions (FAQs)

Administrative, technical, and contractual questions should be emailed to YFA2017@darpa.mil. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within 7 days of the proposal due date may not be answered. DARPA will post an FAQ list at: <http://www.darpa.mil/work-with-us/opportunities>. The list will be updated on an ongoing basis until the RA expiration date as stated in Part I.

B. Collaborative Efforts/Teaming

This RA solicits single Principal Investigator (PI) proposals; no co-PIs are allowed. However, investigators will be given the opportunity to propose teaming if the nature of the proposal requires it. Combined, teaming and subcontract awards will be limited to no more than 30% of the total grant value. It is preferred that potential team members be university professors fitting the proposer eligibility requirements in Section III. Specific content, communications, networking, and team formation will be the sole responsibility of the participants.

C. Proposers Day

The YFA Proposers Day will be held on October 3, 2016 via webcast. Advance registration is required for every individual intending to view the webcast, either alone or as part of a group. See DARPA-SN-16-72 posted at www.fbo.gov for all details. Participating in the YFA Proposers Day webcast is voluntary and is not required to propose to this solicitation.