



Research Announcement
Young Faculty Award
Defense Sciences Office
DARPA-RA-14-07
NOVEMBER 14, 2013

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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** – Research Announcement (RA) DARPA-RA-14-07
- **Catalog of Federal Domestic Assistance Numbers (CFDA)** – 12.910 Research and Technology Development
- **Dates**
 - Posting Date November 14, 2013
 - **Full Proposals Due by 4:00 p.m., EST, January 7, 2014**
 - Closing Date: 4:00 p.m., EST, January 7, 2014
- **Concise description of the funding opportunity** - This RA solicits groundbreaking single-investigator proposals from junior faculty for research and development in the areas of Physical Sciences, Engineering, Mathematics, Medicine, Biology, Information and Social Sciences of interest to DARPA's Defense Sciences Office (DSO), and Microsystems Technology Office (MTO).
- **Anticipated individual awards** – Multiple awards are anticipated.
- **Types of instruments that may be awarded** -- DARPA intends to award grants to eligible university faculty; each grant will be a maximum level of \$500,000 for 24 months (specifically, a 12-month base period and 12-month option period each a maximum of \$250,000).
- **Any cost sharing requirements** – None.
- **Agency contact**

Points of Contact:

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Part II: Full Text of Announcement

I. FUNDING OPPORTUNITY DESCRIPTION

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Research Announcement (RA) process. This RA is being issued, and any resultant selection will be made, using procedures under Federal Acquisition Regulation (FAR) 35.016 and the Department of Defense Grant and Agreement Regulatory System (DoDGARS) Part 22 for Grants and Cooperative Agreements. Any negotiations and/or awards will use procedures under FAR 15.4, Contract Pricing, as specified in the RA (including DoDGARS Part 22 for Grants and Cooperative Agreements). Proposals received as a result of this RA shall be evaluated in accordance with evaluation criteria specified herein through a scientific review process.

DARPA RAs are posted first on the Federal Business Opportunities (FedBizOpps) website, <https://www.fbo.gov/>, and, as applicable, the Grants.gov website, <http://www.grants.gov/>. The following information is for those wishing to respond to the RA.

The 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, 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.

This RA solicits ground-breaking single investigator proposals for research and development in specific technical areas of interest within Physical Sciences, Engineering, Materials, Mathematics, Biology, Computing, Informatics, and Manufacturing of interest to DARPA's Defense Sciences Office (DSO) and Microsystems Technology Office (MTO). Further detail regarding technical areas of interest can be found in the Technical Areas topics list. Proposals that fail to respond directly to a Technical Area will be considered nonresponsive.

Proposals 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 each 12 month phase. Proposers should familiarize themselves with and address the Heilmeier Catechism in responding to this RA.

Proposed research should focus on innovations that will enable revolutionary advances in the selected topic area. High-risk/high-payoff ideas that could potentially transform a field or technology are strongly encouraged. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

Proposals that offer only incremental advances upon existing R&D and technologies will be deemed nonresponsive to this RA.

This solicitation is limited to participation by young investigators as defined in the Eligibility Information, Section III. The RA seeks proposals for a research activity consisting of a 24-month base period broken into two 12-month phases with a maximum funding level of \$250,000 per phase (\$500,000 maximum total funding for the 24-month base period). For exceptional YFA project performance over the 24-month base period, up to 4 YFA performers will be awarded a “Director’s Fellowship” with a maximum of an additional \$500,000 in follow-on funding for an additional 12-month period.

Proposals should include a 24-month base period consisting of two 12-month phases accompanied by a short summary of the proposed follow-on work for the 12-month option period. A cost proposal must be included for the 12-month Director’s Fellowship option. During the second 12-month phase of the base YFA program, the performers who are nominated to receive the Director’s Fellowship may be required to update their proposals (including costs) to reflect expected future technical tasks based on the actual progress made previously.

During the 24-month base period, 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 Services in execution of their missions, and current National Security challenges. It is expected that YFA recipients will participate in a subset of the visit/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 funds for such visits within the total budget of their proposal.

The proposals will be reviewed by panels of Government experts. The proposal review process is expected to be very competitive and highly selective.

Technical Topic Areas:

This RA solicits single investigator proposals for research and development in the areas of Physical Sciences, Engineering, Mathematics, Medicine, Biology, Information and Social Sciences of interest to DARPA’s Defense Sciences Office (DSO) and Microsystems Technology Office (MTO). **Proposers must specify ONE and only one of these topic areas, and salient subtopic areas if applicable, for their proposal and identify this on the cover page.** Note that DARPA reserves the right to assign proposals to a different topic and/or subtopic areas other than that which was indicated by the proposer.

Applicants who have questions about specific topic areas should email DARPA-RA-14-07@darpa.mil with the topic area stated in the subject line. Your question will be forwarded to the appropriate office to provide a response.

- 1. Optimizing Supervision for Improved Autonomy:** Many of today's defense robots (for example, Explosive Ordnance Disposal (EOD) robots) are teleoperated, enhancing protection by providing action at a distance. Although these robots help remove military personnel from danger, they do not always improve productivity. In some cases they lower productivity, as teleoperators usually have worse situational awareness and less control fidelity than is typical for direct observation and action. DARPA is currently exploring greater autonomy and improved productivity in robotics through the Autonomous Robotic Manipulation (ARM), Legged Squad Support System (LS3) and the DARPA Robotics Challenge (DRC) programs. Additional information on these existing programs can be found on the DARPA website, <http://www.darpa.mil/>. Under this topic area, DARPA seeks innovative approaches to answering some or all of the following questions in supervised autonomy: Can modes beyond simple imperatives be used to enhance supervision of a robot? Given the asymmetric bandwidth of human input/output (the visual system is relatively high bandwidth, the motor system much lower) can other modalities be used to communicate enhanced situational awareness and state from a robot to its supervisor? What should the language of supervised autonomy communications between a human and a robot be? How can supervision methods be made robust to communications degradation (in latency, bandwidth, and availability)? How can multiple robots be controlled and coordinated by smaller numbers of supervisors? How would the necessary autonomy intelligence be implemented in the robot?
- 2. Neurobiological Mechanisms of Social Media Processing:** The U.S. military's newest command does not have a geographical area of responsibility—rather, U.S. Cyber Command oversees operations in cyberspace, including computer-to-computer communications, social media, and web-delivered information. Given a need to deter and influence both state and non-state actors using cyber-mediated communications, it is important to understand how technologies such as social media interact with neural mechanisms to drive human behavior. Proposals of interest under this topic area include those that examine social media and multimedia to ascertain how human interaction with these elements of cyberspace modulates neural processing mechanisms in ways significant to deterring and influencing social behavior. Of particular interest are interactions that influence reward processing, social cognition, theory of mind, or empathy. Proposals which examine particular aspects of social network structure and function in cyber-media and connect those to neural mechanisms driving behavior change in an experimental context are of greatest interest under this topic area. This

includes any behavioral changes relevant to conflict, but especially those linked to major neural processing mechanisms.

- 3. Next Generation Neural Sensing for Brain-Machine Interfaces:** Current design of neuroprosthetics involves implanting micro- or macro-electrophysiological arrays into the brain to sense neural activity. This method of opening a window into the brain and implanting devices into the tissue has not fundamentally changed in over 50 years. This approach has limited the ability to obtain systems-based information from large numbers of single neurons. DARPA is seeking applications that transform the methodology of sensing signals from the brain. Applications must propose new techniques for non-invasively sensing the firing activity from large numbers of single neurons simultaneously. The technique must be deployed in awake, behaving subjects performing a brain-machine interface task. Applications that propose incremental modifications to electrophysiological methods or variations of MRI will be considered nonresponsive.
- 4. Mathematical and Computational Methods to Identify and Characterize Logical and Causal Relations in Information:** The ability to synthesize new information is fundamental to learning and improving human cognitive capabilities. Learning is generally accumulative and is shaped by what we already know. Thanks to the Internet and other technological advances, the scale and scope of available information is growing at an exponential rate while humans have limited time and cognitive resources. Past technological advances such as calculators, computers, and the Internet have helped progressively improve our productivity in many fields including science and engineering and the economy. While these advances have provided better computational tools and access to searchable information, they have limited utility in addressing the problem of synthesizing multi-modal information to generate new knowledge in complex scientific fields. The scope of this effort is to define and develop novel analytical and computational methods and algorithms. These novel methods should search, analyze, structure, organize, synthesize, and model unstructured information and multi-modal observations leading to new testable hypotheses, concepts and predictive theories. Applicants to this topic should propose work in the areas of architectural design and tradeoffs, and algorithms with defined metrics in any aspect of the above capabilities.
- 5. Time-Dependent Integrated Computational Materials Engineering:** Integrated Computational Materials Engineering (ICME) has become a critical approach to rapid design, development, and integration of new material technologies. Work in this area is focused on developing process/microstructure/property relationships in order to better inform design and more accurately predict material performance in service. However, performance predictions to date are largely limited to time-independent properties such as tensile strength. Foundational research is needed for time-

dependent ICME tools that predict the effect of microstructural parameters on damage accumulation and fatigue response. Ultimately such efforts would tie process parameters to component life. Approaches can vary from ab initio physics-based simulations, to phenomenological models, to purely mathematical treatments of limited sets of process/microstructure/life measurements. Incorporation of measurements with probabilistic variation as model inputs is encouraged. Ti-6Al-4V and In718+ are materials of particular interest; electron beam direct manufacturing and direct metal laser sintering are manufacturing processes of particular interest.

- 6. Long-range Detection of Special Nuclear Materials:** Long-range (~1 km) stand-off detection of special nuclear materials remains a key national security challenge. Traditional approaches that have been studied as potential solutions include active interrogation using photons and neutrons, and passive detection based on the material's radioactive signatures. The success of these methods is limited, can be very scenario dependent, and can be greatly affected by shielding and other defense mechanisms. Under this topic area, DARPA seeks ideas that can either add orders-of-magnitude detection capability to these existing methods, or novel approaches that could have significantly greater detection capabilities than these methods. Desirable detection capabilities include time-to-detection, range, quantity and type of materials that can be identified, and robustness to defense mechanisms like shielding. Proposers should understand the problem from a systems point-of-view and identify the key fundamental research that will be done for enabling the new revolutionary stand-off detection capability. For example, this might include the study of novel directional and mono-energetic sources for active interrogation or new passive detection modalities.
- 7. Alternate Fusion Concepts:** Controlled fusion remains a grand multi-disciplinary challenge with potentially revolutionary commercial and military applications. Internationally, the primary efforts and facilities are focused on magnetically confined fusion based on tokamak configurations and inertially confined fusion using lasers, and to a lesser extent, pulsed power approaches. The primary tokamak and laser-based efforts are unlikely to scale to compact power plants suitable for DoD applications. Other applications, such as radiation sources relevant to DoD, require pulsed output in addition to compactness. There exists an array of less explored and less understood alternate fusion confinement concepts that could potentially achieve net gain with the desired compactness and output. These concepts range from gas dynamic traps, to spheromaks, to various pinch configurations. The performance of many of these alternate concepts can be heavily affected by kinetic behaviors in addition to the expected fluid dynamics. Validated modern simulation tools are required for effective exploration of multiple concepts in order to identify, advance, and understand the most promising configurations. DARPA seeks proposals that address one or both of the following:

- Application of new plasma simulation tools to an alternate fusion concept to provide new game-changing understanding and predictive capabilities for that concept. Proposers should explain why a particular concept was chosen for study and why it might have significant advantages in terms of its ability to reach a burning plasma state in a compact device versus other alternative concepts.
- Development of scalable and adaptable plasma simulation techniques that can account for kinetic effects of these alternate concepts in a computationally effective manner. The proposer should explain how their proposed technique compares to the state of the art, such as traditional particle-in-cell and hybrid techniques, and why the new techniques might achieve desirable reduction in computational efforts that would allow effective parameter exploration of these alternate fusion concepts.

8. New Materials and Devices for Monitoring and Modulating Local

Physiology: DARPA seeks innovative approaches for modulating physiological function by, for example, stimulating peripheral nerves (vagus) to modulate the immune system. Pioneering work has revealed not only the ability to influence the inflammatory process and protein expression levels using electrical stimulation, but also the ability to change cell fate and influence wound healing processes through stimuli such as electric fields, changing membrane potential via ionic flows, mechanical stimulation and ultrasound. An evolving understanding of how peripheral neurons and cellular and tissue bioelectric states interact with immune cells, the circulatory system and organ function is laying the groundwork for devices that may lead to transformative therapies and regenerative medicine that are highly specific and local (compared to systemic molecular approaches) and methods for continuous physiological monitoring.

Advances in technology have enabled stimulating and recording at increasingly higher resolution. However, implantable devices that permit continuous monitoring and modulation face a number of challenges, such as bio-fouling, motion artifacts, power, conformability and integration of multi-modal recording and stimulation. Applicants should propose new approaches that address current gaps in the capability of implantable devices. Both traditional approaches that utilize electronic, optical and mechanical modalities are of interest, as well as cutting edge approaches utilizing 3D printing and other nano and microfabrication methods for integration of actual living (perhaps genetically modified) cells or other active biologics encapsulated within the device matrix to serve a functional role in sensing and modulation. 3D printing methods could also facilitate the design of complex device geometries with composite substrates and interconnects for active components. The device surfaces could be textured or coated with materials to promote neural tissue integration and increase biocompatibility. Biodegradable scaffolds could also be incorporated to deliver therapeutics or

provide temporary structural support during device fabrication and implantation. Proposers should explicitly discuss how their approach is new, addresses limitations of the current state of the art, and demonstrate a familiarity with current commercial technologies that are implantable.

- 9. Methods and Theory for Fundamental Circuit-Level Understanding of the Human Brain:** DARPA seeks innovative experimental and theoretical research in three areas that are of paramount importance for elucidating the fundamental functions of the human brain. Proposals should be directed to one of the areas, but can address multiple areas if there is a clear and unifying connection across the effort.

Sub-Area 1: Non-invasive in vivo measurement techniques – The primary objective of this area is the development of label-free and through-skull techniques that achieve single neuron spatial ($\sim 10\ \mu\text{m}$) and temporal ($\sim 1\ \text{ms}$) resolution over volumes of at least $1\ \text{mm}^3$. Methods that directly measure neural activity (i.e., action potentials) and can be parallelized/scaled to simultaneously measure multiple areas are highly preferred. Of particular interest are methods that have the ability to maintain maximum resolution properties at depth ($> 5\ \text{cm}$).

Sub-Area 2: Imaging through highly scattering media – The primary objective of this sub-area is to determine fundamental limits of imaging point objects through highly scattering media, and should be cast in terms of realistic experimental parameters including, but not limited to: frame rate, volume of object space explored, source brightness, detection reliability, and estimation accuracy. Over the spectral range of 600 to 1700 nm the brain tissue has an effective attenuation (absorption + scattering) length that ranges from 100 to 400 μm . Of particular interest is the theoretical analysis of imaging modalities that are capable of imaging through 10s to 100s of effective attenuation lengths (i.e., centimeters) in the brain tissue.

Area 3: Models of neural circuitry – The primary objective of this area is the development of a unifying model of neural processing and information storage. Specific topics of interest include, but are not limited to:

- Elements capturing timescale and global modulators of synaptic plasticity, proteins, and second messengers
- Cellular memory modulated by epigenetic mechanisms
- Energetics of processes consistent with metabolic load of the brain
- Information transfer between brain regions
- Inputs/outputs of memory formation and recall and neocortex feedback
- Synchronization to global oscillations
- Mechanisms of the linkages that bridge scales
- Essential role of noise and temporal synchrony

10. Hierarchically Complex Materials that Respond and Adapt: Composites represent the state of the art in high performance materials. Structures such as carbon fiber and metal foam composites were innovated years ago and undergo failure without warning and in ways that are unlike biological composites (e.g., organs, limbs). Current composites have a limited set of traits. The next generation of materials is predicted to integrate many materials organized across multiple length scales. This hierarchical order is anticipated to provide new traits such as self-healing, non-linear actuation, response to stimuli and self-monitoring. Applicants under this topic area should propose strategies to design, construct, and organize complex materials that possess one or more of these traits. Responsive proposals will address materials that go beyond the state of the art as well as a strategy to characterize them. Stand-alone computational and experimental efforts may be proposed, but DARPA is most interested in projects that combine elements of prediction (computation) and synthesis/characterization (experiment). Proposals addressing scalability of the methods and materials are of particular interest.

11. Disruptive Materials Processing: Defense manufacturing is characterized by small volume and high performance but is becoming less and less affordable as volumes are reduced. This topic seeks to develop disruptive materials processing technologies for affordable future systems and platforms. Disruptive technologies are generally characterized by lower cost, rather than enhanced performance, which enables them to be used in products where the incumbent technology is too expensive. The disruptive technology establishes a new learning curve where its performance improves to the point where the incumbent technology is replaced. An example of a potential project of interest under this topic area is low cost methods to produce near-net-shaped single crystals by self-assembly in the solid state. While template grain growth has been used to produce textured polycrystalline materials, the orientation of two (or in some case three) crystal axis of seed crystals will be required. Ceramic fiber reinforced ceramic matrix composites provide another example. A low cost powder based process to co-sinter fibers and matrix would be an interesting alternative to expensive ceramic matrix ceramic fiber composites (CMCs). Co-fired approaches in the past have relied on pressure densification which increases cost and reduces geometric complexity required in the final article. A pressure-less densification process would greatly improve the attractiveness of this approach. For the purpose of this topic, any disruptive materials processing approached may be proposed. The examples given here are not intended to limit the imagination of what may be proposed for this topic.

- 12. Disruptive Computing Architectures:** The criteria and constraints by which the optimality of embedded computer systems is assessed have changed. The number of floating point operations executed is not the best metric for an embedded application algorithm. Processing is no longer central; central processors are no longer appropriate. The hardware and software architectures of embedded systems must change in response to new realities. Applicants to this topic should propose work that explores new structures, hardware and software, for embedded processing systems. Hardware to be considered must reasonably be expected to be deployed within five to ten years. Software to be considered must be appropriate to anticipated hardware platforms. Structures and tooling strictly above the level of devices and circuits are within scope. For example, the mechanisms by which data is moved within a complex memory hierarchy, be they hardware or software, are of interest.
- 13. Appliqué Antenna Elements for Platform Integration:** Nearly every DoD platform from the soldier on the ground to the satellite in orbit relies on one or more antennas for communications and sensing. The workhorse of the military antenna world is the half-wave monopole or "whip" antenna, which is cheap, durable, and easy to repair or replace in the field. However, whip antennas for the most used communications bands between HF and UHF can become large, which can limit platform mobility. Applicants to this topic should propose research on appliqué antenna elements that approach two-dimensionality, which can be applied directly to metal or other conductive surfaces while maintaining whip-like radiation pattern and efficiency. The proposed research should have the potential to revolutionize antenna technology for Department of Defense electromagnetic communications, sensing, and electronic warfare systems.
- 14. Modeling Phonon Generation and Transport in the Near Junction Region of Wide-Bandgap (WBG) Transistors:** DARPA seeks innovative electro-thermal co-design methods for multi-scale thermal generation and transport within active wide-bandgap devices, across interfaces, and through emerging materials technologies introduced for heat spreading and rejection. In many DoD applications (e.g., those enabled by integrated RF amplifiers and power electronics using wide band-gap materials), inherent inefficiencies in energy conversion and the continual push for underlying device performance have resulted in rapidly escalating heat generation rates in the near-junction region. Traditionally, device design focuses on energy efficiency, while thermal transport is assigned to packaging and substrate design. Consequently, there have been wide-ranging efforts within both areas to introduce material solutions favoring thermal properties, but without an overall systems perspective. These materials range from well-understood (but challenging to implement) high conductivity materials like diamond, to emergent systems such as carbon forms and even materials that are speculated to out-perform diamond by seeking materials with reducing scattering among phonon

branches. One barrier to advancing these solutions more rapidly through design cycles is the multi-domain simulation problem of coupling electron transport and carrier statistics, phonon transport and populations, and ultimately full-wave electromagnetic solvers. While measured results are often reconciled with simulations *ex post facto* through the manual combination of dissimilar mature physical models in each domain, a predictive simulation paradigm that follows energy at the fundamental carrier level to useful signal output and thermal dissipation is significantly beyond the state of the art for any one simulation capability.

Solutions are sought to treat phonon generation at the device junction level with sufficient sophistication that their transport and statistics are comparable to the treatment of charged carriers at the sub-micron scale. Likewise, at the macroscopic scale the resulting thermal transport should transition to compatibility with packaging and Electro-magnetic (EM) scales that are often mm and cm lengths. Current DARPA efforts are investigating approaches to bring thermal management out of the packaging environment and into close physical contact with the device junctions where heat is generated. These approaches include the introduction of high thermal conductivity layers (such as diamond) within microns of device junctions, the engineering of near-junction interface thermal resistances, and application of active single-phase and two-phase liquid microchannel coolers within the chip.

15. Advanced Automation and Microfluidic Technologies for Engineering

Biology: Current platforms developed for complex, genome-scale engineering of biological systems are often custom-designed, of limited throughput, and tailored by individual labs to meet unique needs. These characteristics simultaneously limit access to transformative technologies and slow adoption of advances that drive the industrialization of synthetic biology. These systemic barriers underscore several challenges inherent to engineering biology - reproducibility, robustness, and experimental complexity and efficiency. Novel automated, high throughput, scalable approaches can reduce experimental variability and inefficiency while expanding and enabling new experimental capabilities to reliably engineer new, complex biological designs.

DARPA seeks novel, scalable microfluidic approaches to automate and accelerate the design-build-test cycle. The advances generated should yield a step-change in microfluidics and engineering biology capabilities and proposals should explicitly indicate how the technical approach enables currently impossible, complex biological designs. Of specific interest are projects that, at a minimum, demonstrate a hardware implementation of a unit operation directly applicable to the engineering biology design-build-test cycle that exceeds the relevant state-of-the-art benchtop or microfluidic protocol. Example units of operations may include: DNA synthesis and

assembly, genome engineering, host transformation, strain or product characterization, real-time feedback for design optimization.

16. Energy Recovery in Post-CMOS Technologies: Earlier in the evolution of electronics scaling and CMOS, there was substantial work in the area of charge recovery in logic-bearing instruments as a means of reducing total power consumption and energy per operation. It was during this era that concepts such as charge-recovery and charge-recycling logic, adiabatic circuits, and reversible computing were created and explored. With a few notable exceptions (i.e., resonant clocking), energy-conserving engines were never fully realized, due in large part to the lower-Q, lossy nature of VLSI, interconnect parasitics, and the non-idealities of the MOSFET device itself. More recently however, the search for a post-CMOS replacement logic switch has included studies of devices that use tokens expressed in photons, spin, and other *resonant* excitation phenomena to express information. Are these new oscillatory venues hosted in a media of sufficiently high Q to sustain meaningful resonant energy recovery?

Proposers responding to this topic area are asked to describe enabling new devices and particularly the specific, attendant energy recovering circuit and design architectures which may realize true energy recovery. This topic area invites ideas which, once enabled by a small number of key technical contributions on top of existing processes, may actually be realized in practice. These new approaches must offer logically complete compute solutions, while recovering a substantial portion of energy devoted to operand evaluation and transfer. Examples of logic evaluation structures using oscillatory tokens include photonic and spin-based devices. Proposed solutions should NOT require the use of unusual contrivances such as super-cooling or superconductivity to achieve such a goal. Performers will be expected to develop a quantitative means of benchmarking their concept's effectiveness, and then to use them as figures of merit. The goal is to find a means of enabling the DoD to reduce the impacts that excessive power consumption have on the warfighter.

17. Thin Film Transistors for High Performance RF and Power Electronics: Thin Film Transistor (TFT) technology has been enormously successfully at leveraging amorphous material to create low-cost, massively integrated devices with modest performance that are successful in a variety of applications such as control electronics for flat panel displays. In contrast, conventional semiconductor technologies have advanced to create devices with exquisite performance at a relatively high cost and low integration area that are used in a range of RF and Power applications such as cell phone power amplifiers. Applicants to this topic should propose work that explores the extension of TFT technologies to RF and Power switching relevant performance metrics to demonstrate a relatively high performance device with

the cost and integration capabilities of the TFT approach. This work should have the potential to revolutionize DoD electronics systems.

18. Neural Inspired Computer Engineering: There has been significant research in understanding neural models at the level of ion-channels and spiking neurons. Various kinds of silicon neurons have been designed and fabricated that have reasonable spiking dynamics and synaptic plasticity. In addition, a number of realistic circuits, based on 10s of neurons have been developed for a variety of simple applications. What is less common is integrating such models into larger, more complex subsystems and then systems that create new capabilities at the application level. It is time to go to the next step and investigate the development of systems consisting of large numbers of neurons that can be configured to execute complex operations, such as knowledge representation and probabilistic inference, which can then enable sophisticated, complex applications.

In this topic we are looking for studies of such “meso-scale” neural systems that would find eventual application in complex, high bandwidth sensor data processing and robotic control. Although modular cortical circuits based on cortical columns constitute promising high level models, other system architectures are also possible. In addition, we are interested in work on devices, interconnect, and other components that scale to large neural systems.

Proposers are encouraged to review the DARPA mission statement, and current program descriptions at the DARPA website <https://www.darpa.mil/> to view examples of current DARPA investments in the topic areas outlined above. This is not meant as instruction to duplicate those efforts, but rather to illustrate that current programs are aimed at research which will substantially advance our capabilities in these areas. Proposers are encouraged to propose novel, high-risk, high-impact efforts. 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 performer.

II. AWARD INFORMATION

Multiple awards are anticipated, each at a maximum of \$500,000 (\$250,000 maximum per year for a one year base period and a one year option period). The amount of resources made available under this RA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation, and to make awards without discussions with proposers. The Government also reserves the right to conduct discussions if it is later determined to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award.

In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that proposer. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases.

Awards under this RA will be made to proposers on the basis of the evaluation criteria listed below (see section labeled “Application Review Information”, Sec. V.), and program balance to provide overall value to the Government. The Government reserves the right to request any additional, necessary documentation once it makes the award instrument determination. Such additional information may include but is not limited to Representations and Certifications. The Government reserves the right to remove proposers from award consideration should the parties fail to reach agreement on award terms, conditions and cost/price within a reasonable time or the proposer fails to timely provide requested additional information. Proposals identified for negotiation may result in a grant depending upon the nature of the work proposed, the required degree of interaction between parties, whether or not the research is classified as Fundamental Research, and other factors.

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. Proposers are advised that if they propose grants, DARPA may select other award instruments, as it deems appropriate. 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.

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 a solution means other than a fundamental research, 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 subcontractor may be conducting contracted fundamental research. In those cases, it is the prime contractor's responsibility to explain in their proposal why its subcontractor's effort is contracted 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 subcontractors, 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 subcontractor proposals for Contracted Fundamental Research, papers resulting from unclassified contracted 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 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, e-mail 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 by-mail to prc@darpa.mil or via 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/NewsEvents/Public_Release_Center/Public_Release_Center.aspx.

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

This RA solicits single investigator proposals for research and development in the specific Technical areas of interest to DARPA's Defense Sciences Office (DSO) and Microsystems Technology Office (MTO) as outlined in Part II, Section I.

Participation is limited to untenured Assistant or Associate Professors within 5 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.

Previous YFA recipients are not eligible to apply to this or any future YFA program. Applicants are limited to a maximum of three (3) applications to the DARPA YFA program during their term of eligibility. As this was a new requirement as of the 2009 YFA program, previous unsuccessful submissions to the program prior to 2009 will NOT be counted against the limit. Applicants should clearly state on the cover sheet any prior YFA submissions.

Applicants are also limited to ONE submission to this RA.

Proposers should provide in their proposal a listing of past, current, and pending support, including sponsor, funding level, performance dates, and level of all federally funded research efforts. 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. If you have been or currently are a performer on a DARPA program, please list this clearly on the cover sheet as indicated in Section IV.B.3.a.

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA.

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.

(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 and terms and conditions. This information is required for FFRDCs proposing to be prime contractors or subcontractors. 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 eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

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 to the DARPA-RA-14-07 mailbox before time and effort are expended in preparing a proposal and mitigation plan.

C. Other Eligibility Criteria

Collaborative Efforts

This solicitation is for single investigator proposals only; however, investigators will be given the opportunity to propose teaming if the nature of the proposal requires it. Teaming and or 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 guidelines. Specific content, communications, networking, and team formation will be the sole responsibility of the participants.

IV. APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Package

This solicitation contains all information required to submit a proposal. No additional forms, kits, or other materials are needed. This notice constitutes the total solicitation. No additional information is available, except as provided at <https://www.fbo.gov> or <http://Grants.gov>, nor will a formal Request for Proposal (RFP) or additional solicitation regarding this announcement be issued. Requests for the same will be disregarded.

B. Content and Form of Application Submission

1. Security and Proprietary Issues

NOTE: If proposals are classified, the proposals must indicate the classification level of not only the proposal itself, but also the anticipated award document classification level.

The Government anticipates proposals submitted under this RA will be unclassified. However, if a proposal is submitted as “Classified National Security Information” as defined by Executive Order 13526, then the information must be marked and protected as though classified at the appropriate classification level and then submitted to DARPA for a final classification determination.

Security classification guidance via a DD Form 254, “DoD Contract Security Classification Specification,” will not be provided at this time, since DARPA is soliciting

ideas only. After reviewing the incoming proposals, if a determination is made that the award instrument may result in access to classified information, a DD Form 254 will be issued and attached as part of the award.

Proposers choosing to submit a classified proposal from other classified sources must first receive permission from the respective Original Classification Authority in order to use their information in replying to this RA. Applicable classification guide(s) should also be submitted to ensure the proposal is protected at the appropriate classification level.

Classified submissions shall 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)

Classified submissions shall be in accordance with the following guidance:

Confidential and Secret Collateral Information: Use classification and marking guidance provided by previously issued security classification guides, the DoD Information Security Manual (DoDM 5200.01, Volumes 1 - 4), and the National Industrial Security Program Operating Manual (DoD 5220.22-M) when marking and transmitting information previously classified by another Original Classification Authority. Classified information at the Confidential and Secret level may be submitted via ONE of the two following methods:

1. 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.

OR

2. Mailed via appropriate U.S. Postal Service methods (e.g., (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: Defense Sciences Office
Reference: DARPA-RA-14-07
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

All Top Secret materials: Top Secret information should 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.

Special Access Program (SAP) Information: SAP information must be transmitted via approved methods. Prior to transmitting SAP information, contact the DARPA SAPCO at 703-526-4052 for instructions.

Sensitive Compartmented Information (SCI): SCI must be transmitted via approved methods. Prior to transmitting SCI, contact the DARPA Special Security Office (SSO) at 703-526-4052 for instructions.

Proprietary Data: All proposals containing proprietary data should have the cover page and each page containing proprietary data clearly marked as containing proprietary data. It is the proposer's responsibility to clearly define to the Government what is considered proprietary data.

Proposers must have existing and in-place prior to execution of an award, approved capabilities (personnel and facilities) to perform research and development at the classification level they propose. It is the policy of DARPA to treat all proposals as competitive information, and to disclose their contents only for the purpose of evaluation. Proposals will not be returned. The original of each proposal 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.

2. Full Proposal Submission Information

The YFA proposal process consists of a full-proposal submission only. There will not be a proceeding white paper phase. The technical volume of the proposal will consist of a one (1) page cover sheet, a one (1) page transmittal letter, a one (1) page executive summary slide (template is available as attachment 1 to this RA), a five (5) page technical proposal and statement of work (SOW), a one (1) page biosketch, and a list of references.

Proposers are required to submit full proposals by the time and date specified in the RA. **Early submissions of full proposals are strongly encouraged. Applicants are strongly encouraged to discuss their YFA submission with their Office of Sponsored Research (or equivalent) several weeks in advance of the submission deadline.** DARPA will review all full proposals submitted using the published evaluation criteria in Section V. The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included into a single proposal.

DARPA intends to use electronic mail and fax for correspondence regarding DARPA-RA-14-07. **Proposals may not be submitted by fax or email;** any proposals sent via these methods will be disregarded.

Proposals not meeting the format described in the RA may not be reviewed.

Grant Submission Process for Proposers

Proposals may be submitted through one of the following methods: (1) hard copy mailed directly to DARPA; or (2) electronic upload per the instructions at <http://www.grants.gov/applicants/apply-for-grants.html>. 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 Grants.gov do not submit hard copy proposals in addition to the Grants.gov electronic submission.

Grants.gov requires proposers to complete a one-time registration process before a proposal can be electronically submitted. If proposers have not previously registered, this process can take between three business days and four weeks. See the Grants.gov registration checklist at http://www.grants.gov/assets/organizationregcheck_092112.pdf for registration requirements and instructions.

Once Grants.gov has received a proposal submission, Grants.gov will send two e-mail messages to advise proposers as to whether or not their proposals have been validated or rejected by the system; **IT MAY TAKE UP TO TWO DAYS TO RECEIVE THESE E-MAILS.** The first e-mail will confirm receipt of the proposal by the Grants.gov system; this e-mail only confirms receipt, not acceptance, of the proposal. The second will indicate that the application has been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors. If the proposal is validated, then the proposer has successfully submitted their proposal. . If the proposal is rejected, the proposed must be corrected and resubmitted 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, the proposer will receive a third e-mail from Grants.gov. To avoid missing deadlines, proposers should submit their proposals in advance of the final proposal due date with sufficient time to receive confirmations and correct any errors in the submission process through Grants.gov. For more information

on submitting proposals to Grants.gov, visit the Grants.gov submissions page at:
<http://www.grants.gov/applicants/apply-for-grants.html>.

Upload two separate documents, Volume I, Technical and Management Proposal and Volume II, the Cost Proposal as attachments to the application package. **No other Grants.gov forms are required.** Please note that Grants.gov does not accept zipped or encrypted proposals. More detailed instructions for using Grants.gov can be found on the Grants.gov website.

Proposers electing to submit grant proposals as hard copies must complete the 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. Technical support for Grants.gov submissions may be reached at 1-800-518-4726 or support@grants.gov.

Please note that due to the new DARPA security policies, submitters to Grants.gov will still need to visit <https://dsobaa.darpa.mil> to register their organization concurrently and are also required to send in a password form via e-mail to the address listed in Part I to ensure the DSO RA office can verify the security of their submission.

For All:

All administrative correspondence and questions on this solicitation, including requests for information on how to submit a full proposal to this RA, should be directed to the e-mail address below.

RA Administrator
E-mail: DARPA-RA-14-07@darpa.mil

DARPA intends to use electronic mail for correspondence regarding DARPA-RA-14-07. Proposals may not be submitted by fax or e-mail; any so sent will be disregarded. DARPA encourages use of the Internet for retrieving the RA and any other related information that may subsequently be provided, including but not limited to a FAQ page.

3. Full Proposal Format

All full proposals must be in the format given below. Nonconforming proposals will be rejected without review. Proposals submitted to Grants.gov must adhere to guidelines outlined on the grants.gov website but shall contain a clearly identifiable Technical and Cost Volumes as identified in the previous section (Section IV.B.2). All proposals pages shall be printable on single-spaced, 8-1/2 by 11 inch paper with type not smaller than 12 point font. Smaller font may be used for figures, tables, and charts. The page limitation for full proposals includes all figures, tables and charts. Volume I, Technical Management Proposal, may include an attached bibliography of relevant technical papers or research notes (published and unpublished), which document the technical ideas and approaches upon which the proposal is based. Intellectual Property/Patents Requirements and the bibliography are not included in the page counts. The submission of other supporting materials along with the proposal is strongly discouraged and will not be considered for review. Not including the attached bibliography, **Volume I shall not exceed 9 pages**. This page limit includes the one (1) page required cover sheet described in Section I. Maximum page lengths for each section are shown in braces {} below. All full proposals must be written in English.

a. Volume I, Technical and Management Proposal

Section I. Administrative

- A. Cover sheet to include:
- (1) RA number (DARPA-RA-14-07);
 - (2) Technical topic area (proposers may only submit to ONE topic area, and salient subtopic area(s) if applicable);
 - (3) Lead Organization submitting proposal;
 - (4) Type of business, selected among the following categories: “HBCU”, “MI”, “EDUCATIONAL”, “NON PROFIT” OR “NOT-FOR-PROFIT”;
 - (5) Proposer’s reference number (if any);
 - (6) Other team members (if applicable) and type of business for each;
 - (7) Proposal title;
 - (8) Technical point of contact (Program Manager or Principle Investigator) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail
 - (9) Contracting Officer or Grant Officer to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail;
 - (10) Total funds requested from DARPA, separated by base award and options (if any);
 - (11) Date proposal was submitted;
 - (12) Number of previous submissions to YFA RA and submission date(s);
 - (13) Date of Tenure-track appointment position; and
 - (14) List of any and all current and past involvement with DARPA as a performer.

- B. Official transmittal letter.

Section II. Summary of Proposal

This section provides an overview of the proposed work as well as an introduction to the associated technical and management issues. Further elaboration will be provided in Section III.

- A. {1} Executive summary slide to include the following (see attachment 1 for template format):
- Key insight/innovation
 - Scientific/technical impact
 - Potential Department of Defense application
 - Breakout of Budget for Base (Year 1) and Option (Year 2)
- B. {5} Technical proposal and Statement of Work (SOW)
- C. {1} Biosketch

Section III. Detailed Proposal Information

- A. {No page limit} A brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based.
- B. {No page limit} Listing of past, current, and pending support, including sponsor, funding level, performance dates, and level of effort.

b. Volume II, Cost Proposal – {No Page Limit}

All proposers, including FFRDCs, must submit the following:

- A. Cover sheet to include:
- (1) RA number (DARPA-RA-14-07);
 - (2) Technical topic area (proposers may only submit to ONE topic area, and salient subtopic area(s) if applicable);
 - (3) Lead Organization submitting proposal;
 - (4) Type of business, selected among the following categories: “HBCU”, “MI”, “OTHER EDUCATIONAL”, OR “OTHER NONPROFIT”;
 - (5) Proposer’s reference number (if any);
 - (6) Other team members (if applicable) and type of business for each;
 - (7) Proposal title;
 - (8) Technical point of contact (Program Manager or Principle Investigator) to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail
 - (9) Contracting Officer or Grant Officer to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax, e-mail;
 - (10) Award instrument requested: grant;
 - (11) Place(s) and period(s) of performance;

- (12) Total proposed cost separated by base award and option(s) (if any);
- (13) Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office or ONR office;
- (14) Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office, if applicable;
- (15) Date proposal was prepared;
- (16) DUNS number;
- (17) TIN number;
- (18) CAGE Code; and
- (19) Proposal validity period.

Note that nonconforming proposals may be rejected without review.

- B. The proposers cost volume shall provide cost and pricing data, or other than cost or pricing data in sufficient detail to substantiate the program price proposed (e.g., realism and reasonableness). All pages shall be printed on 8-1/2 by 11 inch paper with type not smaller than 12 point. No smaller font may be used. **In doing so, the proposal shall provide a detailed cost breakdown by major program tasks by government fiscal year, by phase and calendar fiscal year. See Appendix A and B for sample cost element summary sheets.** The breakdown shall include:

- (1) Total program cost broken down by major cost items:
 - a. Direct Labor – Including individual labor categories with associated labor hours and direct labor rates;
 - b. Consultants – If consultants are to be used, proposer must provide a copy of the consultant's proposed SOW as well as a signed consultant agreement or other document which verifies the proposed loaded daily / hourly rate, hours and any other proposed consultant costs (e.g., travel);
 - c. Indirect Costs – Including Fringe Benefits, Overhead, General and Administrative Expense, Cost of Money, Fee, etc. (must show base amount and rate);
 - d. Travel – Provide the purpose of the trip, number of trips, number of days per trip, departure and arrival destinations, number of people, etc.;
 - e. Other Direct Costs – Itemized with costs; back-up documentation is to be submitted to support proposed costs;
 - f. Equipment Purchases – Itemization with costs, 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; (NOTE: For equipment purchases, include a letter stating why the proposer cannot provide the requested resources from its own funding);
 - g. Materials – Itemization with costs, 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; and

h. Major program tasks by Government Fiscal Year (GFY = Oct 1 – 30 Sep).

- (2) A summary of total program costs by phase and task;
- (3) A summary of projected funding requirements by month;
- (4) A priced Bill-of-Materials (BOM) clearly identifying, for each item proposed, the source of the unit price (i.e., vendor quote, engineering estimate, etc.) and the type of property (i.e., material, equipment, special test equipment, plant equipment, information technology (IT)¹, for each computer hardware cost, computer software cost, and other related costs such as computer maintenance fees or support services costs (NOTE: for IT purchases, include a letter stating why the proposer cannot provide the requested resources from its own funding);
- (5) An itemization of Subcontracts. **All subcontractor cost proposal documentation must be prepared at the same level of detail as that required of the prime.** Subcontractor proposals should include Interdivisional Work Transfer Agreements (IWTA) or evidence of similar arrangements;
- (6) Identification of pricing assumptions of which may require incorporation into the resulting award instrument (e.g., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Expert(s), etc.); and
- (7) Any Forward Pricing Rate Agreement, DHHS rate agreement, other such approved rate information, or such documentation that may assist in expediting negotiations (if available).

¹ IT is defined as “any equipment, or interconnected system(s) or subsystem(s) of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the agency.” (a) For purposes of this definition, equipment is used by an agency if the equipment is used by the agency directly or is used by a contractor under a contract with the agency which – (1) Requires the use of such equipment; or (2) Requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. (b) The term “information technology” includes computers, ancillary, software, firmware and similar procedures, services (including support services), and related resources. (c) The term “information technology” does not include – (1) Any equipment that is acquired by a contractor incidental to a contract; or (2) Any equipment that contains imbedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. For example, HVAC (heating, ventilation, and air conditioning) equipment such as thermostats or temperature control devices, and medical equipment where information technology is integral to its operation, are not information technology.”

NOTE: PROPOSERS ARE CAUTIONED THAT PROPOSALS MAY BE REJECTED IF SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

4. Submission Dates and Times

c. Full Proposal Date

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

The full proposal (original and designated number of hard and electronic copies) must be submitted to DARPA/DSO 675 North Randolph Street, Arlington, VA 22203-2114 (Attn.: DARPA-RA-14-07) **on or before 4:00 p.m., EST, January 7, 2014**. Failure to comply with the submission procedures may result in the submission not being evaluated.

DARPA will acknowledge receipt of complete submissions via e-mail and assign control numbers that should be used in all further correspondence regarding proposals. If no confirmation is received within two business days, please contact the RA Administrator at DARPA-RA-14-07@darpa.mil to ensure the proposal was submitted properly.

DARPA will post FAQ's, on

http://www.darpa.mil/Opportunities/Solicitations/DSO_Solicitations.aspx. In order to receive a response to your question, submit your question to DARPA-RA-14-07@darpa.mil.

5. Funding Restrictions

This RA seeks proposals for a 24 month research activity consisting of a 12 month base period and a 12 month option period, with a maximum funding level of \$250,000 per year (\$500,000 maximum total funding).

6. Other Submission Requirements

Not applicable.

V. APPLICATION REVIEW INFORMATION

A. Evaluation Criteria

Proposals will be evaluated using the following criteria, listed in descending order of importance: (a) Overall Scientific and Technical Merit; (b) Potential Contribution and Relevance to the DARPA Mission; (c) Cost Realism; and (d) Realism of Proposed Schedule.

(a) 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. 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.

(b) 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. In addition, the evaluation will take into consideration the extent to which the proposed intellectual property (IP) rights will potentially impact the Government’s ability to transition the technology.

(c) Cost Realism

The proposed costs are realistic for the technical and management approach offered and demonstrate the proposer’s practical understanding of the effort. The costs proposed are based on realistic assumptions, reflect a sufficient understanding of the technical goals and objectives of the RA, and are consistent with the proposer’s technical approach (to include the proposed Statement of Work). At a minimum, the prime proposer and proposed subawardees substantiate the proposed costs with the type and number of labor hours proposed per task as well as the types and kinds of materials, equipment and fabrication costs proposed. It is expected that the effort will leverage all available relevant prior research in order to obtain the maximum benefit from the available funding. For efforts with a likelihood of commercial application, appropriate direct cost sharing may be a positive factor in the evaluation. DARPA recognizes that undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.

(d) Realism of Proposed Schedule

The proposed schedule aggressively pursues performance metrics in the shortest timeframe and accurately accounts for that timeframe. The proposed schedule identifies and mitigates any potential schedule risk.

B. Review and Selection Process

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.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort.

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Pursuant to FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

For evaluation purposes, a proposal is the document described in "Full Proposal Format," Section IV.B.5. Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal.

Restrictive notices notwithstanding, proposals may be handled for administrative purposes by support contractors. These support contractors are prohibited from competition in DARPA technical research and are bound by appropriate non-disclosure requirements.

Subject to the restrictions set forth in FAR 37.203(d), 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.

VI. AWARD ADMINISTRATION INFORMATION

A. Selection Notices

As soon as the evaluation of a proposal is complete, the proposer will be notified that (1) the proposal has been selected for funding pending contract negotiations, or (2) the proposal has not been selected. These official notifications will be sent via e-mail to the Technical and Administrative POCs identified on the proposal coversheet.

B. Administrative and National Policy Requirements

1. Meeting and Travel Requirements

There will be a program kickoff meeting and all key participants are required to attend. Performers should also anticipate regular program-wide PI Meetings and periodic site visits at the Program Manager's discretion.

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&rn=1.

4. Export Control

Per DFARS 225.7901-4, all procurement contracts, other transactions and other awards, as deemed appropriate, resultant from this solicitation will include the DFARS Export Control clause (252.225-7048).

5. Subcontracting

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)), it is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts, and to assure that prime contractors and subcontractors carry out this policy. Each proposer who submits a contract proposal and includes subcontractors is required to submit a subcontracting plan in accordance with FAR 19.702(a) (1) should do so with their proposal. The plan format is outlined in FAR 19.704.

6. 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 proposer who submits a proposal involving the creation or inclusion of electronic and information technology must ensure that 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 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.

7. System for Award Management Registration (SAM) 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/>.

8. Reporting Executive Compensation and First-Tier Subcontract Awards

FAR clause 52.204-10, "Reporting Executive Compensation and First-Tier Subcontract Awards," will be used in all procurement contracts valued at \$25,000 or more. A similar award term will be used in all grants and cooperative agreements.

9. Representations by Corporations Regarding an Unpaid Delinquent Tax Liability or a Felony Conviction under any Federal Law – Fiscal Year 2013 Appropriations (Deviation 2013-O0010)

(a) In accordance with sections 8112 and 8113 of Division C and sections 514 and 515 of Division E of the Consolidated and Further Continuing Appropriations Act, 2013, (Pub. L. 113-6), none of the funds made available by that Act for DoD (including Military Construction Funds) 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.

10. 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 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.

C. Reporting

The number and types of reports will be specified in the award document, but will include as a minimum, quarterly financial status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

D. Electronic Systems

1. Representations and Certifications

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

2. Wide Area Work Flow (WAWF)

Unless using another means of invoicing, performers will be required to submit invoices for payment directly to <https://wawf.eb.mil>. Registration in WAWF will be required prior to any award under this RA.

3. i-Edison

The award document for each proposal selected for funding will contain a mandatory requirement for patent reports and notifications to be submitted electronically through i-Edison (<http://s-edison.info.nih.gov/iEdison>).

VII. AGENCY CONTACTS

The preferred method of communication for this RA is e-mail.

Points of Contact:

The Technical POC for this effort is Dr. William Casebeer.
E-mail: DARPA-RA-14-07@darpa.mil

The RA Administrator for this effort can be reached at:
E-mail: DARPA-RA-14-07@darpa.mil

DARPA/DSO
ATTN: DARPA-RA-14-07
675 North Randolph Street
Arlington, VA 22203-2114

VIII. OTHER INFORMATION

A. Intellectual Property Procurement Contract Proposers

1. Noncommercial Items (Technical Data and Computer Software)

Proposers responding to this RA requesting a procurement contract to be issued under the FAR/DFARS shall identify all noncommercial technical data and noncommercial computer software that it plans to generate, develop, and/or deliver under any proposed award instrument in which the Government will acquire less than unlimited rights, and to assert specific restrictions on those deliverables. Proposers shall follow the format under DFARS 252.227-7017 for this stated purpose. In the event that proposers do not submit the list, the Government will assume that it automatically has “unlimited rights” to all noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, unless it is substantiated that development of the noncommercial technical data and noncommercial computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, then proposers should identify the data and software in question, as subject to Government Purpose Rights (GPR). In accordance with DFARS 252.227-7013 Rights in Technical Data - Noncommercial Items, and DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation, the Government will automatically assume that any such GPR restriction is limited to a period of five (5) years in accordance with the applicable DFARS clauses, at which time the Government will acquire “unlimited rights” unless the parties agree otherwise. Proposers are advised that the Government will use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.” It is noted an assertion of “NONE” indicates that the Government has “unlimited rights” to all noncommercial technical data and noncommercial computer software delivered under the award instrument, in accordance with the DFARS provisions cited above. Failure to provide full information may result in a determination that the proposal is not compliant with the RA – resulting in nonselectability of the proposal.

A sample list for complying with this request is as follows:

NONCOMMERCIAL

Technical Data and Computer Software To be Furnished With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(NARRATIVE)	(LIST)	(LIST)	(LIST)

2. Commercial Items (Technical Data and Computer Software)

Proposers responding to this RA requesting a procurement contract to be issued under the FAR/DFARS shall identify all commercial technical data and commercial computer software that may be embedded in any noncommercial deliverables contemplated under the research effort, along with any applicable restrictions on the Government’s use of such commercial technical data and/or commercial computer software. In the event that proposers do not submit the list, the Government will assume that there are no restrictions on the Government’s use of such commercial items. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.” Failure to provide full information may result in a determination that the proposal is not compliant with the RA – resulting in nonselectability of the proposal.

A sample list for complying with this request is as follows:

COMMERCIAL

Technical Data and Computer Software To be Furnished With Restrictions	Summary of Intended Use in the Conduct of the Research	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(NARRATIVE)	(LIST)	(LIST)	(LIST)

B. Non-Procurement Contract Proposers – Noncommercial and Commercial Items (Technical Data and Computer Software)

Proposers responding to this RA requesting a Grant, Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototype shall follow the applicable rules and regulations governing these various 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. Although not required, proposers may use a format similar to that described in Paragraphs 1.a and 1.b above. The Government may use the list during the evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer’s assertions. If no restrictions are intended, then the proposer should state “NONE.” Failure to provide full information may result in a determination that the proposal is not compliant with the RA – resulting in nonselectability of the proposal.

C. All Proposers – Patents

Include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: (1) a representation that you own the invention, or (2) proof of possession of appropriate licensing rights in the invention.

D. All Proposers – Intellectual Property Representations

Provide a good faith representation that you either own or possess appropriate licensing rights to all other intellectual property that will be utilized under your proposal for the DARPA program. Additionally, proposers shall 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.

APPENDIX A: Grants Cost Element Summary Sheet

SUMMARY PROPOSAL BUDGET YEAR -

OFFEROR:

PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR (PI/PD):

A. SENIOR PERSONNEL, PI/PD, Co-PI's, Faculty and Other Senior Associates (List separately with title, A.7. show number in parentheses)	Man Hrs/Mos	Rates	Person Months			Funds Requested by Offeror
			CAL	ACAD	SMR	
1.						\$
2.						\$
3.						\$
4.						\$
5.						\$
6.						\$
7.	0					\$

B. OTHER PERSONNEL (SHOW NUMBERS)						
1.		POST DOCTORAL ASSOCIATES				
2.		OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				
3.		GRADUATE STUDENTS				
4.		UNDERGRADUATE STUDENTS				
5.		SECRETARIAL - CLERICAL (if charged directly)				
6.		OTHER				
7.		TOTAL SALARIES AND WAGES				\$

C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)						
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)						\$

D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.00. ATTACH ADDITIONAL EXPLANATION PAGES, IF NECESSARY.)						
1.					\$	
2.					\$	
3.					\$	
TOTAL PERMANENT EQUIPMENT						\$

E. TRAVEL (LIST DETAILS ON SEPARATE WORKSHEET)						
1. DOMESTIC (INCLUDE CANADA, MEXICO, AND U.S. POSSESSIONS)						
2. FOREIGN						\$

F. PARTICIPANT SUPPORT COSTS						
1. STIPENDS						
2. TRAVEL						
3. SUBSISTENCE						
4. OTHER						
TOTAL PARTICIPANT COSTS						\$

G. OTHER DIRECT COSTS (LIST DETAILS ON SEPARATE WORKSHEET)						
1. MATERIALS AND SUPPLIES						
2. PUBLICATIONS COSTS/DOCUMENTATION/DISSEMINATION						
3. CONSULTANT SERVICES						
4. COMPUTER (ADPE) SERVICES						
5. SUBAWARDS						
6. OTHER						
7. TOTAL OTHER DIRECT COSTS						

H. TOTAL DIRECT COSTS (A THROUGH G)						\$
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I. INDIRECT COSTS		Rate	Base	Total		
	G & A			\$		
	Fringe			\$		
TOTAL INDIRECT COSTS						\$

J. TOTAL DIRECT AND INDIRECT COSTS (H + I)						\$
--	--	--	--	--	--	----

K. FEE	0%	BASE	\$			\$
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L. COST SHARING						\$
-----------------	--	--	--	--	--	----

M. AMOUNT OF THIS REQUEST						\$
---------------------------	--	--	--	--	--	----

PI/PD NAME (TYPED) & SIGNATURE						DATE
--------------------------------	--	--	--	--	--	------

OFFEROR'S AUTHORIZED REP. NAME (TYPED) & SIGNATURE						DATE
--	--	--	--	--	--	------

APPENDIX B: Cost Volume Checklist

Cost Volume Checklist

The following checklist is provided to assist the proposer in developing a complete and responsive cost volume. Full instructions appear in Section IV.B.5.b of DARPA-RA-14-07. This worksheet must be completed by the proposer and all subcontractors and included with the coversheet of the Cost Proposal.

1. Are all items from Section IV.B.5.b. (Volume II, Cost Proposal) of DARPA-RA-14-07 included on your Cost Proposal cover sheet?

YES **NO**

If reply is “No”, please explain:

2. Does your Cost Proposal include (1) a summary cost buildup by Phase, (2) a summary cost buildup by Year, and (3) a detailed cost buildup of for each Phase that breaks out each task and shows the cost per month?

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain:

3. Does your cost proposal (detailed cost buildup #3 above in item 2) show a breakdown of the major cost items listed below:

Direct Labor (Labor Categories, Hours, Rates)

YES **NO** **Appears on Page(s)** [Type text]

Indirect Costs/Rates (i.e., overhead charges, fringe benefits, G&A)

YES **NO** **Appears on Page(s)** [Type text]

Materials and/or Equipment

YES **NO** **Appears on Page(s)** [Type text]

Subcontracts/Consultants

YES **NO** **Appears on Page(s)** [Type text]

Other Direct Costs

YES **NO** **Appears on Page(s)** [Type text]

Travel

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain:

11. Does your cost proposal include copies of consultant agreements?

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain:

12. If requesting a FAR-based contract, does your cost proposal include a tech/cost analysis for all proposed subcontractors?

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain:

13. Have all team members (prime and subcontractors) who are considered a Federally Funded Research & Development Center (FFRDC), included documentation that clearly demonstrates work is not otherwise available from the private sector AND provided a letter on letterhead from the sponsoring organization citing the specific authority establishing their eligibility to propose to government solicitations and compete with industry, and compliance with the associated FFRDC sponsor agreement and terms and conditions.

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain:

14. Does your proposal include a response regarding Organizational Conflicts of Interest?

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain:

15. Does your proposal include a completed Data Rights Assertions table/certification?

YES **NO** **Appears on Page(s)** [Type text]

If reply is “No”, please explain: