BAA 04-38
Proposer Information Pamphlet (PIP)
for

Advanced Soldier Sensor Information System and Technology (ASSIST)

Information Processing Technology Office (IPTO)
Defense Advanced Research Projects Agency (DARPA)

Technical POC: Dr. Mari Maeda

This Broad Agency Announcement (BAA) will be open for one year from the date of its publication in www.fedbizopps.gov and www.fedgrants.gov. All questions pertaining to this BAA may be submitted to DARPA at the email address: baa04-38@darpa.mil. DARPA may post updates or comments periodically at: http://www.darpa.mil/ipto/solicitations/solicitations.htm.

Although this BAA will be open for one year from its publication date, the Government anticipates that the majority of Phase I program funding will be committed during the first selection phase. To be considered for funding during the first selection phase, full proposals must be received no later than 12:00 NOON ET on Sept 20, 2004.

Abstracts will be accepted beginning one week after the BAA publication date until the abstract closing date of Aug 25, 2004. As abstracts will be reviewed and response letters will be generated on an ongoing basis, early abstract submissions are strongly encouraged.

IMPORTANT NOTICE: Please read the PIP in its entirety, including the section on Proposal Format, as requirements vary for different programs. Those proposals that do not comply with these stated requirements may be returned without review.

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BAA 04-38 PROPOSER INFORMATION PAMPHLET

The Defense Advanced Research Projects Agency (DARPA) selects many of its research efforts through the Broad Agency Announcement (BAA) process. The BAA will be posted directly to FedBizOpps.gov, the single government point-of-entry (GPE) for Federal government procurement opportunities over $25,000. The following information is for those wishing to respond to the BAA.

Advanced Soldier Sensor Information System and Technology (ASSIST), SOLICITATION BAA 04-38, Abstracts Due: Aug 25, 2004; Proposals Due: Sept 20, 2004, Final Closing: August 5, 2005, POC: Dr. M. Maeda, DARPA/IPTO; FAX: (703) 741-7804

1. INTRODUCTION

The DARPA Information Processing Technology Office (IPTO) is soliciting proposals under this BAA to perform research, development, and testing to support the Advanced Soldier Sensor Information System and Technology (ASSIST) program. The main goal of the program is to enhance battlefield awareness via exploitation of information collected by soldier-worn sensors. The program will demonstrate an integrated system and advanced technologies for processing, digitizing and reporting key observational and experiential data captured by warfighters.

1.1 PROGRAM OBJECTIVES

The U.S. military has developed extensive standardized reporting mechanisms to support information collection and communications. Warfighters are called upon to report in a timely and accurate manner key observations and experiences during ground missions. Such information sharing is essential for improving situational understanding and overall operational effectiveness especially in today's urban combat environments. The confusion of the battlefield combined with the physical and psychological stresses on the warfighters can make this task very difficult. Furthermore, today's verbal and text-based reports limit the extent of information that is conveyed and critical information is lost.

The objective of the program is to exploit soldier-worn sensors to augment the soldier's recall and reporting capability to enhance situational understanding. The effort will develop information processing and representation tools to maximize the utility of data collected by the multi-modal sensors.

1.2 PROGRAM SCOPE AND FUNDING

The program is composed of two consecutive phases. This BAA solicits proposals for the 12-month Phase I effort, which will focus on baseline system development (Task 1) and advanced technology research (Task 2). Phase II will focus on systems

integration and evaluation of advanced capabilities. Proposals for Phase II will be solicited separately in a future BAA.

In Phase I, the program expects to award 4-8 contracts. Awards are expected not to exceed $4.0 M per effort. However, the Government reserves the right to adjust the total program funding and the number of awards to meet the best interests of the program. Phase I is divided into two major task areas. A single abstract/proposal should address a single task area. Therefore two separate abstracts/proposals should be submitted if a team or collaborating teams are interested in tackling both tasks. Each project team should include an appropriate mix of expertise in order to develop an end-to-end, integrated technical solution for the selected task area. Projects that address only one or a subset of technical challenges within a task area are not likely to be funded. A proposal may also include optional tasks that may last up to 6 months.

In general, proposed research should investigate innovative approaches and techniques that enable revolutionary advances in the state-of-the-art. Proposals are not limited to the specific strategies listed below and alternative visions will be considered. However, proposals should be for research that contributes substantially towards the goals stated.

2. TECHNICAL APPROACH

Phase I of the program will demonstrate new capabilities that exploit information captured via soldier-worn sensors. Input streams from sensors detecting location, images, audio, and motion will be logged and processed to create digital reports and representations.

Each proposal should describe a comprehensive technical approach that addresses one of the following two task areas:

Task 1: Baseline System Development – This task stresses *active information capture* and *voice annotations exploitation*. The resulting products from Task 1 will be prototype wearable capture units and the supporting operational software for processing, logging and retrieval.

Task 2: Advanced Technology Research – This task stresses passive collection and automated activity/object recognition. The results from this task will be the algorithms, software, and tools that will undergo system integration in Phase II.

TASK 1: BASELINE SYSTEM DEVELOPMENT

The Task 1 objective is to demonstrate and evaluate a field-deployable capture system together with the associated processing/retrieval/visualization system to support information collection and use by dismounted warfighters. During the Phase I effort, performers will be required to demonstrate the wearable capture system, develop the retrieval system, and participate in field tests where the integrated

capture/retrieval system will be evaluated. Proposals must provide a complete solution for Phase I.

The baseline operational concept involves a dismounted soldier on a patrol or a scout mission, capturing still images of potential value that he annotates with a few spoken words or sentences. The captured data is locally stored together with the time/location information. On returning from the patrol, the soldier edits and logs the data for processing. The system extracts appropriate metadata and distills the collected information into multimedia representations and digital report(s) that may support later patrols and mission planning. The soldier may also have the capability to capture his observations or situation using a video recorder. For example, a short video segment and metadata may be retrieved and transmitted, prompted by soldier command (e.g. "send the last 10 seconds") when an enemy contact situation is encountered.

The minimal capture system will integrate a small digital camera, microphone, GPS, processor, and local storage. Wireless network connectivity, a digital compass and/or inertial sensors may also be incorporated. Widely available COTS components should be utilized but the final system must be appropriately packaged to be worn by a soldier such as mounted to the Personal Armor System Ground Troop (PASGT) family of helmets and attached to a military patrol vest. The capture system must be robust, light-weight and energy-efficient in order to maximize soldier acceptance. User interfaces must be simple, and support sensor control, user information entry (e.g. for assigning priority to images captured), and user commands (e.g. for transmitting data).

The data processing software will extract location/time data, convert speech to text consistent with COTS capabilities, extract keywords and create an indexed multimedia representation of information collected by the different soldiers. The retrieval system will allow user-friendly browsing and navigation of the data.

The proposal should describe details of the system and technical design including the sensor hardware specifics, computing platforms to be used, and the software for the processing and information retrieval system. The system description should address key human factors needs and issues of interoperability with existing soldier systems.

The following list of systems issues should be expanded and possible approaches described: support for hands-free operation and the role of voice-commands or other sensor trigger mechanisms; ways the sensor heads and base units will be worn; camera lens type choices (rectilinear, fisheye wide angle etc); sensor control and data entry techniques; on-wearer storage and power including the possible length of operation; system configuration choices (e.g. on-demand or continuous capture); tradeoff between the weight and the robustness of the wearable unit, data security; use of specialized vocabulary set and ontologies; and supported data transfer modes. The detailed functions and features of the processing, retrieval and analysis

software should also be described. The proposal should also include a discussion of the expected indexing accuracies based on the use of available speech-to-text converters and GPS location extraction under different environmental and use conditions. The proposal should identify and describe the new software to be developed and any existing software components (proprietary, commercial, or open-source) that will be integrated into the system.

BASELINE SYSTEM EVALUATIONS: The effectiveness of the integrated system will be tested in MOUT (Military Operations on Urban Terrain) field exercises by military user participants. Tests will be conducted using the system and repeated without using the system. Comparisons will be made by questionnaire-based assessment between the tests. Questionnaires will include comprehension and accuracy testing as well as subjective utility evaluation. In order to facilitate early feedback from military users and to strengthen the user interface design, the performer will develop mockup user interface and information retrieval system. Two five-day periods of field testing at the Fort Knox or Fort Benning MOUT sites should be assumed for costing purposes. Approximately 12 capture units and two processing/retrieval systems should be made available for field testing. The proposal should designate a Test Director who will be the main point of contact with the Military Test Coordinator and the Independent Evaluation Team. The performers shall be responsible for transporting the equipment to the test sites, storage of the prototypes during the testing period, participating in the testing, repair and maintaining malfunctioning units, training of the military users, and assessing technically the performance of their system.

SCHEDULE: The proposal should describe an aggressive schedule including the plans for the following:

- Program kickoff (within Month 1)
- System requirements developed
- Preliminary design review
- Mockup system developed
- Critical design review
- Baseline capture system completed
- Baseline processing and retrieval system completed

The baseline system prototype should be completed no later than Month 10 to allow time for field testing and evaluations starting at Month 11. Progress will be presented at PI meetings and project reviews.

Task 2: Advanced Technology Research

The Task 2 objective is to develop advanced technologies that will ultimately enable fully automated organization of soldier-worn sensor data. The project will research the use of different sensor modalities including sensors that could activate other sensors based on voluntary or involuntary physiological queues, and soldier-worn video cameras for continuous or semi-continuous data capture. Advanced processing

will enable automated identification and extraction of key information content from the multiple raw input streams. This task area will address the deficiencies identified by the baseline system and create enabling technologies that will be incorporated into the system during Phase II.

DARPA seeks development of key technological components that enable sensor data capture, processing, retrieval and analysis including the following:

- Capture of multiple sensor data streams (e.g. video, motion, location, audio including interface to military radio communication modes); advanced sensor trigger techniques; selective on-wearer storage in appropriate formats and resolutions; data protection; on-wearer user interfaces (preferably hands-free, spoken language interface) for sensor control, data entry, and data access.
- Interpretation of raw data through vision processing, linguistic interpretation, and motion/location extraction; automatic recognition and classification of objects, scenes, and activities through exploitation of multiple sensory inputs and use of contextual inferences.
- Metadata extraction and association; identification of events and states; creation of higher order representations of activities, scenes and patterns; segmentation of recorded data; multimedia database technology.
- Development of general ontology and knowledge representations for objects, events and activities; development of mission or task-specific representations; learning tools and infrastructure to support the ongoing co-development of ontological data structures and the perception/interpretation/inference components. Existing DoD taxonomies for visual information and military report data fields should be considered for integration into higher-level military information infrastructure.
- User interfaces for offline editing; interfaces for metadata-keyed browsing, video/audio playback, and data querying; visualization of data content including displays of physical and logical relationships; information correlation and analysis tools. Development of interfaces for both laptop-based systems and soldier-worn systems are sought.

These capabilities and functions should be addressed within the context of the overall system architecture. The program also emphasizes the system's ability to learn from experiences so that performance improves as it accumulates knowledge and experience. The proposal should describe the system's learning process including the interfaces and tools for users to teach, tune, reinforce, and to correct the system. Several examples should be developed that illustrate the mechanics of the system expanding its sensor-derived knowledge base, learning new object/event classes, and improving its classification accuracy. The system should also support an embedded explanation capability allowing the user to learn why the system reasoned or behaved as it did.

Leveraging of existing hardware and software is highly encouraged. Commercially available sensors and communication resources should be selected to serve as surrogates for the equipment of the future dismounted warfighter, consistent with those being considered for the U.S. Army's Future Force Warrior and the Special Operations SOF Warrior concepts (See http://www.natick.army.mil/soldier/wsit/ and http://soal.socom.mil/documents/SOAE_APBI_Presentation_13May04.pdf). The development of hardware such as wearable computing platforms, sensors, localization infrastructure, and communications modules is not the focus of the program. However, the selection rationale for these elements, including critical specifications and estimated costs, should be presented in detail in the proposal. In particular, the data storage components to be employed and an estimate of the range of volume of data of each type expected to be stored per unit time should be included in the system analysis.

APPLICATIONS: Each Task 2 effort should demonstrate solutions toward one or several military applications, and develop tools and interfaces to demonstrate the unique system capability within the warfighting and training environments. Example applications include (but are not limited to) the following:

After Action Reviews (AAR's) and Reporting: These may be based on a single soldier or multiple soldier perspective. The system will present critical experiential elements such as *what, who, where, and when,* building on its powerful episodic memory technology. Output may be in the form of multimedia digital reports and other representations that allow key experience segments to be searched and replayed. Some of the relevant events and activities may include the following: walking, running, talking to other soldiers, interacting with civilians, firing weapons, hearing shots etc.

Mapping urban and indoor spaces: Elements of an urban environment are extracted as a dismounted warfighter moves through outdoor and indoor spaces. Contributions from multiple sources including GPS, inertial navigation units, motion detectors, and video inputs are synergistically exploited to create a spatial knowledge representation. Tests should be made with and without a soldier providing verbal annotations - for example, uttering "door" as he passes each door. Some of the relevant activities and objects include: entering an indoor space, going through a portal, riding an elevator, climbing/descending stairs, and recognizing open or closed doors. Possible end products include three-dimensional representations, cognitive floor maps and other forms of augmented maps, demonstration of reasoning and question answering using appropriate spatial representations.

Real-time information extraction and sharing: Ongoing semantic extraction from incoming sensor streams enables key observations and experiential items to be identified and transmitted in real-time. Demonstrations may include information sharing between dismounted soldiers while clearing a building, generation of a digital Contact Report, Situation Report, or SALUTE report to be transmitted to the Tactical

Operations Center, and analysis of digital reports to identify developing trends or patterns.

Offerors are encouraged to propose other military applications with strong potential for operational impact.

TECHNOLOGY AND SYSTEM EVALUATIONS: Performers will test and evaluate technologies using their facilities and report results at PI meetings and reviews. Additionally, performers will work with the members of an Independent Evaluation Team (IET) to develop a common evaluation process and metrics, and participate in formal evaluation events at Months 6 and 12. These events will establish initial baseline capability and test the Phase I advanced prototype capability, respectively. The IET will be a neutral group separately funded by the program.

Within each effort, the performer must quantify the capability to be realized through their proposed concepts. Specific quantitative metrics and goals relevant to DoD missions and technical component requirements must be established. Hence the proposal should provide descriptions of technical claims and detailed testing procedures and tools for evaluating the following:

1. The utility of the system in enhancing operational effectiveness. A possible approach may include having a user answer a set of questions with and without the use of the retrieval system, or through administration of questionnaires and surveys. Concepts for measuring operational effectiveness should be developed in the proposal.

2. The accuracy of object/event/activity identification and labeling. The proposal should describe the classes of objects, events and activities that the system will identify together with the targeted classification accuracy that is expected to be demonstrated at the initial testing at Month 6 or earlier. The proposal should then describe the targets for Phase I final testing. Experiments will also assess the relative importance of different sensor and user feeds to the system performance. The resulting tradeoff analysis will provide input to Phase II of the program.

3. The system's ability to improve its classification performance through learning, and the process by which the system is able to recognize *new classes* of events and activities. Examples of possible tests may include measuring the number of new events and event classes correctly recognized after the team is given a fixed time interval to tune and teach the system; or tracking the number of corrections applied to the system over time. Appropriate tools and monitoring points should be designed into the system to facilitate these assessments.

Offerors are strongly encouraged to expand on the above and/or propose alternative metrics and testing procedures. The program emphasizes objective and quantitative system evaluations, and one of the major criteria for funding is the extent to which the evaluation methodology has been developed within the proposal. Note that all testing

procedures must take into consideration privacy regulations and laws. Researchers shall not capture imagery and/or audio of any person without that person's express permission in advance. A week of field testing at Fort Knox or Fort Benning MOUT site should be accounted for in the proposal.

SCHEDULE: The proposal should include a schedule for design reviews, software prototype completion, initial test and experiments (at Month 6 or earlier), and final Phase I evaluation and analysis.

3. GENERAL INFORMATION

All interested, responsible, and qualified sources capable of satisfying the Government's needs may submit a proposal for consideration by DARPA. Foreign participants and/or individuals may participate to the extent that such participants comply with any necessary Non-Disclosure Agreements, Security Regulations, Export Laws, and other governing statutes applicable under the circumstances. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and abstracts and join others in submitting proposals and abstracts. However, no portion of this BAA will be set aside for HBCU and MI participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

SECURITY INFORMATION

Security classification guidance on a DD Form 254 (DoD Contract Security Classification Specification) will not be provided at this time since DARPA is soliciting ideas only. After reviewing incoming proposals, if a determination is made that contract award may result in access to classified information, a DD Form 254 will be issued upon contract award. If you choose to submit a classified proposal you must first receive the permission of the Original Classification Authority to use their information in replying to this BAA.

Classified submissions shall be in accordance with the following guidance:

Collateral Classified Information: Use classification and marking guidance provided by previously issued security classification guides, the Information Security Regulation (DoD 5200.1-R), 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 only be mailed via U.S. Postal Service (USPS) Registered Mail or U.S. Postal Service 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 address to:

Defense Advanced Research Projects Agency
ATTN: (Name of the Technical Office)
Reference: (BAA Number)
3701 North Fairfax Drive
Arlington, VA 22203-1714

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
3701 North Fairfax Drive
Arlington, VA 22203-1714

All Top Secret materials should be hand carried via an authorized, two-person courier team to the DARPA CDR.

Special Access Program (SAP) Information: Contact the DARPA Program Security Support Center (PSSC) at 703-812-1962/1970 for further guidance and instructions prior to transmitting SAP information to DARPA. All Top Secret SAP, must be transmitted via approved methods for such material. Consult the DoD Overprint to the National Industrial Security Program Operating Manual for further guidance. It is strongly recommended that you coordinate the transmission of SAP material and information with the DARPA PSSC *prior to transmission*.

Sensitive Compartmented Information (SCI) Data: Contact the DARPA Special Security Contact Office (SSCO) at 703-812-1993/1994 for the correct SCI courier address and instructions. All SCI should be transmitted through your servicing Special Security Officer (SSO) / Special Security Contact Officer (SSCO). All SCI data must be transmitted through SCI channels only (i.e., approved SCI Facility to SCI facility via secure fax).

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 Offeror's responsibility to clearly define to the Government what is considered proprietary data.

Offerors 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 that

the formal request is received at this office within 5 days after unsuccessful notification.

4. SUBMISSION PROCESS

Proposals and abstracts must not be submitted by fax or e-mail. If sent by either of these methods, they will be disregarded. This notice in conjunction with the BAA 04-38 FBO Announcement and all references, constitutes the total BAA. A Frequently Asked Questions (FAQ) list specific to this BAA may be provided. The URL for the FAQ will be specified on the DARPA/IPTO BAA Solicitation page. No additional information is available, nor will a formal Request for Proposal (RFP) or other solicitation regarding this announcement be issued. Requests for same will be disregarded.

This Broad Agency Announcement (BAA) requires completion of a BAA Cover Sheet for each Proposal prior to submission. This cover sheet can be accessed at the following URL:

http://www.dyncorp-is.com/BAA/index.asp?BAAid=04-38

After finalizing the BAA Cover Sheet, the offeror must print the BAA Confirmation Sheet that will automatically appear on the web page. Each offeror is responsible for printing the BAA Confirmation Sheet and attaching it to every copy. The Confirmation Sheet should be the first page of the Proposal and/or Abstract. If a offeror intends on submitting more than one Proposal or Abstract, a unique UserId and password must be used in creating each BAA Cover Sheet. Failure to comply with these submission procedures may result in the submission not being evaluated.

4.1 ABSTRACT FORMAT AND SUBMISSION

In order to minimize unnecessary effort in proposal preparation and review, offerors are encouraged but not required to submit brief proposal abstracts in advance of full proposal. An abstract should state clearly the uniqueness of the idea presented in the context of existing state-of-the-art in the technical area of interest. Demonstrating that the offeror has a clear understanding of the state-of-the-art and that their proposed effort will make significant improvements therein is essential for a successful proposal. A description of the team structure and the technical expertise of the principal investigator and other key team members should be provided. Finally, an outline of evaluation procedure, a list of deliverables, and an estimate of the program costs should be included. Abstracts should not be longer than 6 pages.

Offerors must submit an original plus 4 hard copies of the abstract and 2 electronic copies (i.e., **2** separate disks) of the abstract. Electronic copy shall be in on IBM PC-formatted floppy disk or CD-ROM in a format readable by Microsoft Word 2000. Each disk must be clearly labeled with BAA 04-38, proposer organization, abstract

title (short title recommended) and Copy ___ of 2. The proposal abstract (original and designated number of hard and electronic copies) must be submitted to DARPA/IPTO, ATTN: BAA 04-38, 3701 N. Fairfax Drive, Arlington, VA 22203-1714, in time to reach DARPA by 12:00 NOON (ET) **Wednesday, August 25, 2004** to guarantee review. DARPA will acknowledge receipt of submissions and assign control numbers that should be used in all further correspondence regarding proposals.

DARPA will make a recommendation to offerors either encouraging or discouraging submission of full proposals. DARPA will accept abstracts beginning 1 week after the the BAA is posted until the abstract closing date. Because the recommendations based on abstracts will be made on an ongoing basis, offerors are encouraged not to wait until the closing date to make their submissions. Regardless of the recommendation, the decision to propose is the responsibility of the offeror. All submitted proposals will be fully reviewed, regardless of the disposition of the proposal abstract.

4.2 PROPOSAL SUBMISSION

Offerors must submit an original plus 4 hard copies of the proposal and 2 electronic copies (i.e., **2** separate disks). Electronic copy shall be in on IBM PC-formatted floppy disk or CD-ROM in a format readable by Microsoft Word 2000. Additional papers (as described in Section III) may be in Acrobat (.pdf) format. Each disk must be clearly labeled with BAA 04-38, proposer organization, proposal title (short title recommended) and Copy ___ of 2. The proposal (original and designated number of hard and electronic copies) must be submitted to DARPA/IPTO, ATTN: BAA 04-38, 3701 N. Fairfax Drive, Arlington, VA 22203-1714, in time to reach DARPA by 12:00 NOON (ET) **Monday, September 20, 2004**, to guarantee review during the first evaluation phase. However, **Advanced Soldier Sensor Information System and Technology (ASSIST) Program BAA 04-38** will remain open until 12:00 NOON (ET) **August 5, 2005.** Thus, proposals may be submitted at any time from issuance of this BAA through **August 5, 2005**. While the proposals submitted after the **September 20, 2004,** deadline will be evaluated by the Government, offerors should keep in mind that the likelihood of funding such proposals is less than for those proposals submitted in connection with the initial evaluation and award schedule. DARPA will acknowledge receipt of submissions and assign control numbers that should be used in all further correspondence regarding proposals.

The Government intends to use support contractors who are bound by appropriate non-disclosure requirements for administrative purposes. DARPA may also solicit input on technical aspects of the proposals from non-Government consultants and experts who are also bound by appropriate non-disclosure requirements. However, non-Government technical consultants/experts will not have access to proposals that are labeled by their offerors as “Government Only.” Use of non-government personnel is covered in FAR 37.203(d).

5. PROPOSAL FORMAT

Proposals shall include the following sections, each starting on a new page (where a "page" is 8-1/2 by 11 inches with type not smaller than 12 point) and with text on one side only. Maximum page lengths for each section are shown in braces { } below.

Cover Page

This page includes the content of BAA Confirmation Sheet including:

A. BAA number;
B. Proposal title;
C. Technical point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address;
D. Administrative point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address;
E. Summary of the costs of the proposed research, including total base cost, estimates of base cost in each year of the effort, estimates of itemized options in each year of the effort, and cost sharing if relevant;
F. Contractor's type of business, selected from among the following categories: "WOMEN-OWNED LARGE BUSINESS," "OTHER LARGE BUSINESS," "SMALL DISADVANTAGED BUSINESS [*Identify ethnic group from among the following: Asian-Indian American, Asian-Pacific American, Black American, Hispanic American, Native American, or Other*]," "WOMEN-OWNED SMALL BUSINESS," "OTHER SMALL BUSINESS," "HBCU," "MI," "OTHER EDUCATIONAL," "OTHER NONPROFIT", or "FOREIGN CONCERN/ENTITY."

Section I. Detailed Proposal Information

This section provides the detailed discussion of the proposed work necessary to enable an in-depth review of the specific technical and managerial issues. Specific attention must be given to addressing both risk and payoff of the proposed work that make it desirable to DARPA.

A. Table of Contents {2}

B. Executive Summary {1}:
This section should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art and alternate approaches. Highlight any other unique strengths, technical or otherwise.

C. Quad Chart {1}:

One presentation formatted slide that summarizes the main objective, key innovations, expected impact, a graphical representation and any other unique aspects of the proposal.

D. Proposal Roadmap {1}:
The roadmap provides a top-level view of the content and structure of the proposal. It contains a synopsis (or "sound byte") for each of the areas defined below. It is important to make the synopses as explicit and informative as possible. The roadmap must be enumerated and cross-reference the proposal page number(s) where each area is elaborated. The roadmap areas are:

1. Main goals of the proposed research (stated in terms of new, operational capabilities).

2. Critical technical barriers (*i.e.*, technical limitations that have, in the past, prevented achieving the proposed results).

3. Main elements of the proposed approach.

4. Rationale that builds confidence that the proposed approach will overcome the technical barriers. ("Our team has the right set of expertise and a strong track record" is NOT a useful statement.)

5. Risks of the approach (Why this is hard).

6. Nature of expected results (unique and critical capabilities to result from this effort and the form in which they will be defined).

7. Methods for scientifically evaluating progress toward end-goal.

8. Cost of the proposed effort.

E. Innovative Claims, Statement of Work and Deliverables {7}:
Describe the project goals and innovative claims. Define the technical tasks to be performed. For each task, provide:

1. A short description of the objectives;
2. A short description of the approach;
3. Identification of organization or team members responsible for task execution;
4. The resources allocated (cost, person-months);
5. The milestones and deliverables.

Describe any interdependencies between the tasks. Provide schedule graphics. Include in this section all proprietary claims to results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this should be stated. The offeror must submit

a separate list of all technical data or computer software that will be furnished to the Government with other than unlimited rights (see DFARS 227).

F. Technical Approach {16}:

1. Detailed Description of the Technical Approach. Provide a problem description and research goals. Provide a detailed description of the technical approach for achieving research goals. Specifically, identify and discuss innovative aspects of the approach for developing the capture, processing, and retrieval systems. This section should describe: the overall architecture, how the data is handled, stored and processed, how segmentation and indexing is done, how data is visualized etc. Proposals should identify DARPA-hard aspects of the problem. Describe risks associated with the approach and the strategies for mitigating them.

2. Evaluation and Experiment Plans. Describe the process for assessing the rate of progression of technical capability over time. Describe metrics and the evaluation/testing procedure. Describe features and tools to facilitate monitoring, testing and evaluations.

3. Comparison with Current Technology. Describe state-of-the-art research and commercial systems with similar capabilities. Include a comparison for the key components of the proposed solution (*e.g.*, capture system, linguistic processing, image interpreter, storage design, user GUI), as well as for the integrated system. Indicate advantages and disadvantages of the proposed effort.

G. Technology Transition and Technology Transfer Targets and Plans {2}:
Discuss plans for technology transition and transfer. Identify specific military organizations for technology transition and possible adaptation for commercialization.

H. Teaming {4}:
The proposal should describe the organizations and the individuals within those organizations that make up the team, including expected duties, relevant capabilities and task responsibilities of team members, and expected relationships among members. A description of the technical, administrative, and business structure of the team and the internal communications plan should be included. Project/function/subcontractor relationships, Government research interfaces, and planning, scheduling, and control practices should be described. *The team leadership structure should be clearly defined.* Provide a brief biography of the key personnel who will be involved in the research along with the amount of effort to be expended by each person during the year. Documentation of previous work or experience in the field of the offeror is especially important. DARPA expects all key personnel associated with a proposal to make a substantial time commitment to the proposed activity.

I. Facilities {1}:
Describe the facilities that would be used for the proposed effort. If any portion of the research is predicated upon the use of Government Owned Resources of any type, the offeror shall specifically identify the property or other resource required, the date the property or resource is required, the duration of the requirement, the source from which the resource is required, if known, and the impact on the research if the resource cannot be provided. If no Government Furnished Property is required to conduct the proposed research, the proposal shall so state.

J. Cost Summary {2}:
Describe the cost breakdown across tasks and across team members.

Section II. Cost

Cost proposals shall provide a detailed cost breakdown of all direct costs, including cost by task, with breakdown into accounting categories (labor, material, travel, computer, subcontracting costs, labor and overhead rates, and equipment) for the entire contract and for each calendar year, divided into quarters. Cost breakdown is required for subcontractors. Where the effort consists of multiple portions that could reasonably be partitioned for purposes of funding, these should be identified as contract options with separate cost estimates for each. Costs for testing should be isolated as a separate line item.

Offerors requiring the purchase of information technology (IT) resources as Government Furnished Property (GFP) MUST attach to the submitted proposals the following information:

1. A letter on Corporate letterhead signed by a senior corporate official and addressed to Dr. M. Maeda, PM, DARPA/IPTO, stating that you either can not or will not provide the information technology (IT) resources necessary to conduct the said research.

2. An explanation of the method of competitive acquisition or a sole source justification, as appropriate, for each IT resource item.

3. If the resource is leased, a lease purchase analysis clearly showing the reason for the lease decision.

4. The cost for each IT resource item.

Awards made under this BAA may be subject to the provisions of the Federal Acquisition Regulation (FAR) Subpart 9.5, Organizational Conflict of Interest. All

offerors and proposed subcontractors must affirmatively state whether they are supporting any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the offeror supports, and identify the prime contract number. Affirmations should be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest, as that term is defined in FAR 2.101, must be disclosed in Section II of the proposal, organized by task and year. This disclosure shall include a description of the action the Contractor has taken, or proposes to take to avoid, neutralize, or mitigate such conflict.

Section III. Additional Information

A bibliography of relevant technical papers and research notes (published and unpublished) that document the technical ideas upon which the proposal is based may be included in the proposal submission. The bibliography may include the URLs from which these papers may be downloaded or viewed. Copies of not more than three (3) relevant papers may be included in the submission. Please note that the materials provided in this section and submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal for evaluation purposes.

6. EVALUATION AND FUNDING PROCESSES

Evaluation of proposals will be accomplished through a scientific review of each proposal using the following criteria, which are listed in descending order of relative importance:

(1) Overall Scientific and Technical Merit: The overall scientific and technical merit must be clearly identifiable and compelling. The technical concepts should be clearly defined and developed. The technical approach must be sufficiently detailed to support the proposed concepts and technical claims. Evaluation will also consider the effectiveness of the system integration and management plan.

(2) Innovative Technical Solution to the Problem: Offerors should apply new and/or existing technology in an innovative way that supports the objectives of the proposed effort. The proposed concepts and systems should show breadth of innovation across all the dimensions of the proposed solution. **Offerors must also specify the metrics and experimental methods for evaluating the performance of the system.**

(3) Potential Contribution and Relevance to the DARPA/IPTO Mission: The offeror must clearly address how the proposed effort will meet the goals of the program and how the proposed effort contributes to significant advances for DARPA/IPTO.

(4) Offeror's Capabilities and Related Experience: The qualifications, capabilities, and demonstrated achievements of the proposed principals and other key personnel for the primary and subcontractor organizations must be clearly shown.

(5) Plans and Capability to Accomplish Technology Transition: The offeror should provide a clear strategy and plan for transition to military forces (and commercial sector, where applicable). Offerors should consider involving potential military transition partners, as appropriate, in any proposed experiments, tests and demonstrations. Offerors should also provide a plan for transition of appropriate technology components and information to the user community.

(6) Cost Realism: The overall estimated costs should be clearly justified and appropriate for the technical complexity of the effort. Evaluation will consider the value of the research to the government and the extent to which the proposed management plan will effectively allocate resources to achieve the capabilities proposed.

The Government reserves the right to select for award all, some, or none of the proposals submitted under this BAA and to make awards without discussions with offerors. The Government reserves the right to conduct discussions if the Source Selection Authority later determines them to be necessary. Proposals identified for funding may result in a contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties and other factors. If warranted, portions of resulting awards may be segregated into pre-priced options.

7. REPORTING REQUIREMENTS/PROCEDURES

The Award Document for each proposal selected and funded will contain a mandatory requirement for submission of DARPA/IPTO Quarterly Status Reports and an Annual Project Summary Report. These reports, described below, will be electronically submitted by each awardee under this BAA via the DARPA/IPTO Technical – Financial Information Management System (T-FIMS).

The T-FIMS URL will be furnished by the government upon award. Detailed data requirements can be found in the Data Item Description (DID) DI-MISC-81612A available on the Government's ASSIST database (http://assist.daps.dla.mil/quicksearch/). An outline of T-FIMS report requirements is as follows:

(a) Status Report: Due at least three (3) times per year – Jan, Apr, & Oct
  1) Technical Report
    a) Project General Information
    b) Technical Approach
      - Accomplishments
      - Goals
      - Significant changes / improvements
    c) Deliverables
    d) Transition Plan
    e) Publications
    f) Meetings and Presentations

g) Project Plans
h) Near Term Objectives
2) Financial Report
3) Project Status / Schedule

(b) Project Summary (PSum): Due once each fiscal year in July

1) All Sections of the Status Report
2) QUAD Chart
a) Visual Graphic
b) Impact
c) New Technical Ideas
d) Schedule

8. ADMINISTRATIVE ADDRESSES

The administrative addresses for this BAA are:

Fax: 703-741-7804
Addressed to: DARPA/IPTO, BAA 04-38

Electronic Mail:
baa04-38@darpa.mil

Electronic File Retrieval:
http://www.darpa.mil/ipto/Solicitations/solicitations.htm

Mail to: DARPA/IPTO
ATTN: BAA 04-38
3701 N. Fairfax Drive
Arlington, VA 22203-1714