

Contract Summary

Agent	Performer	OT/Grant/ Contract #	PoP Start
SSC-SC	Galois	N6600115C4070	9/15/2015
SSC-SC	Iowa State University	N6600115C4068	9/28/2015
SSC-SC	Stealth Software Technologies, Inc	N6600115C4065	8/6/2015
SSC-SC	University of California, Berkeley	N6600115C4066	9/28/2015
SSC-SC	University of Massachusetts, Amherst	N6600115C4067	9/28/2015
AFRL/RI-NY	Carnegie Mellon University	FA87501520281	10/29/2015
AFRL/RI-NY	Carnegie Mellon University	FA87501520277	10/7/2015
SSC-SC	Pacific Science and Engineering	N6600115C4069	9/28/2015
AFRL/RI-NY	Raytheon BBN	FA875016C0006	10/9/2015
SSC-SC	SRI International	N6660115C4071	8/17/2015
AFRL/RI-NY	University of California, Irvine	FA87501620021	10/26/2015
AFRL/RI-NY	Cybernetica, AS	FA875016C0011	10/8/2015
AFRL/RI-NY	Galois	FA875016C0022	10/9/2015
AFRLCMC	MIT-LL	FA870215D00010002	5/20/2015 Pre-BAA Study to support program concept development
WHS-FMD	RAND	W91WAW12C0030	8/1/2015 Pre-BAA Study to support program concept development
SSC-SC	Schafer	N0017814D7914V701	6/1/2014 SETA Support contract to the entire I2O Office.

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www.darpa.mil

Reclaim Your Digital Identity!

In 1890, Louis Brandeis was worried about an invasive gadget that would change the way people recorded and shared information. He was so worried he created a new legal doctrine entitled, “The Right to Privacy”. What was this technological terror? The Kodak instantaneous camera!

We might laugh at that now, but his concerns seem prophetic. Today, every action we take creates a digital contrail of information. Data spews out behind us – from our phones, while we surf the web, when we are in the car or the grocery store, at the doctor, while traveling or even just while staying at home... Everything we do online leaves a trail – a trail that can be followed if you know how.

It’s not all bad. Because of this data, we can get up-to-the-minute travel reports; our businesses become increasingly optimized and profitable; medical workers get early warnings on public health issues – like the flu or Ebola; and governments can interrupt terrorist activities. All good things, which we benefit from every day.

But there are downsides too. Both democracy and innovation depend on creativity and the open exchange of diverse ideas. Many fear that when every action is recorded and analyzed it will have a chilling effect, such as stifling legitimate debate on sensitive and controversial political issues. It strikes at the heart of being a free society.

So what should we do? Must we take the bad with the good or is there something better we could do? Can we imagine technology that would allow us to retain the societal benefits and yet protect our personal privacy?

This is precisely the question we are asking at DARPA. We are inventing ways to break the apparent tension between being able to tap into the huge value of data while also maintaining privacy. Rather than having to compromise between these two, our program (named “Brandeis”) aims to build a third option: enabling safe and predictable sharing of data while reliably preserving privacy. The old way of thinking is that privacy is about

stopping other people from seeing sensitive information. Our new vision is that privacy technologies are about being so in control of your data that you feel able to allow greater sharing.

This mental reset comes at a critical juncture in human history. As a society we are at a choice point: either we act, or we risk losing privacy for ever. At the moment, none of us really knows what we are revealing, when, and to whom. It's gotten out of our control. And even if we did have control, our data world is so complex, we can't easily say who we want to allow to access our data and for what purpose. Just think how bad those privacy policies are that we all love reading! And then, even worse, when we do share private data it is gone from our control forever. Someone else has it. Maybe it gets stolen. Or worse, sold!

At DARPA, we're developing methods to protect private information without depleting the larger value it can have – methods like multiparty differential privacy, that never need to decrypt your data while also guaranteeing that no-one could rediscover your data from any output result. And we think we can use machine learning to turn intuitive privacy preferences into actionable decisions for how your data may and may not be used. Both of these demand some heavy computer science, but if we are successful, we will be able to accelerate information sharing because we can become confident that our data will be used only for its intended purpose and no other.

The potential impact is dramatic. Confidence in data privacy will enable increased data sharing that can help us build smarter cities where buildings, energy and traffic are optimized minute by minute; it can enable new cyber defenses where every company and device instantly shares network and cyber-attack data. It can even open the doors to personalized medicine by discovering correlations between your genetic information and the effectiveness of therapies. These visions are just beginnings. With strong privacy controls, who knows what we will be able to invent!

BRANDEIS

Mark Jones
DARPA Contracts Management Office

Proposers' Day
Arlington, VA
March 12, 2015





**If the BAA contradicts any information
in these slides,**

the BAA takes precedence.



BAA PROCESS OVERVIEW

- BAA follows procedures in accordance with FAR 35.016
- The BAA will be posted (as will any needed amendments) on FEDBIZOPPS at www.fbo.gov and Grants.gov at <http://www.grants.gov/>
- BAA allows for a variety of technical solutions.
- The BAA will have one closing time/date.
- BAA covers all info needed to submit proposals. Follow instructions for proposal preparation and submittal.



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ELIGIBILITY

- All interested/qualified sources may respond subject to the parameters outlined in BAA
- Foreign participants/resources may participate to the extent allowed by applicable Security Regulations, Export Control Laws, Non-Disclosure Agreements, etc.
- FFRDCs and Government entities
 - Subject to applicable direct competition limitations
 - Must clearly demonstrate eligibility per BAA
- Real and/or Perceived Conflicts of Interest
 - Identify any conflict
 - Include mitigation plan



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PROPOSAL PREPARATION INFORMATION

- Consists of two volumes – Technical (with required Appendix A) and Cost
- Volume 1 - Technical and Management
 - Volume 1 has a page limitation. The evaluation team will not review any submitted pages that exceed the Volume I limit outlined in the BAA.
 - Volume 1 includes a mandatory Appendix A which does not count towards Volume 1's page limit total.
- Volume 2 – Cost – No page limitation.
- BAA describes the necessary information to address is each volume –
 - Make sure to include every section identified
 - If section does not apply – put “None” (e.g., Animal Use – None, OCI - None)
 - Include a working spreadsheet as part of your Cost Volume submission
 - Remember: Appendix A is mandatory



PROPOSAL PREPARATION TIPS

- **Statement of Work (SOW)** – Write a SOW as if it were an attachment to a contract
 - Don't use proposal language (e.g. we propose to do . . .)
 - Break out work between any phases/time periods identified in the BAA
 - Succinctly and clearly define tasks & subtasks
 - Do not include any proprietary information!
- **Risk** – Do not be afraid to address Risk in Technical Volume
 - Identify risk(s) to show an understanding of technical challenge(s)
 - Discuss potential mitigation plans / alternative directions



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PROPOSAL PREP – TECHNICAL DATA RIGHTS

- Understand – the Government does not own IP it develops – Government receives licensing rights to software/technical data.
- Government desires, at a minimum, **Government Purpose Rights** for any proposed noncommercial software and technical data (SEE DFARS 227 for Patent, Data, and Copyrights).
- **Data Rights Assertions** – IF asserting less than Unlimited Rights, identify the following in Appendix A:
 - Provide and justify basis of assertions
 - Explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and
 - Provide possible nonproprietary alternatives
- IF proposed solution utilizes commercial IP – submit copies of license with proposal.



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ITEMS TO NOTE

- Understand and comply with SAM, E-verify, FAPIIS, i-Edison and WAWF. Links will be available in the BAA.
- Subcontracting Issues
 - NON SMALL BUSINESSES: Subcontracting Plans required for FAR based contracts with subcontracting possibilities expected to exceed \$650,000
 - Subcontractor/Sub awardee cost - Proposals must include, at a minimum, a non-proprietary, subcontractor proposal for EACH subcontractor
 - Subcontractor(s)/Sub awardee(s) will email proprietary proposals separately
 - If utilizing FFRDC, Government entity, or a foreign owned firm as a subcontractor, submit their required eligibility information



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- Proposals must be valid for a minimum of 120 days
- If a prospective proposer believes a conflict of interest exists or may exist (whether organizational or otherwise) or has a question on what constitutes a conflict, the proposer should promptly raise the issue with DARPA by sending the proposer's contact information and a summary of the potential conflict to the BAA mailbox before preparing a proposal and mitigation plan.
- Document files must be in Portable Document Format (.pdf, ISO 32000-1), OpenDocument (.odx, ISO/IEC 26300:2006), .doc, .docx, .xls, or .xlsx formats.
- Submissions must be written in English.



Brandeis Proposers' Day

PROPOSAL SUBMISSION

- Follow submission procedures outlined in the BAA. DO NOT submit proposals except as outlined in the BAA (e.g., email/fax submissions will NOT be accepted).
- Use only one method for submitting a proposal.
- Proposals for Grants/Cooperative Agreements will utilize the Grants.gov website for uploading proposals.
- Proposals for Procurement Contracts/OTAs will utilize DARPA's web-based upload system:
 - If not previously registered – 2 step registration process
 - Submission must be in a single zip file not exceeding 50 MB
 - When submitting – make sure to drop files in correct BAA
 - Must **FINALIZE** submission prior to closing to be considered

DO NOT WAIT UNTIL THE LAST DAY TO BEGIN REGISTRATION / PROPOSAL SUBMISSION PROCESS



Brandeis Proposers' Day

EVALUATION / AWARD

- No common Statement of Work - Proposal evaluated on individual merit and relevance as it relates to the stated research goals/objectives.
- Evaluation Criteria will be identified in BAA.
- Evaluation Process is a scientific/technical review - Reviews conducted by panels of experts and may require contracted Government SETAs bound by strict non disclosure agreements to assist.
- Government reserves the right to select for award all, some, or none of the proposals received, to award portions of a proposal, and to award with or without discussions.



Brandeis Proposers' Day

COMMUNICATION

- Prior to Receipt of Proposals – No restrictions, however Gov't (PM/PCO) shall not dictate solutions or transfer technology. Unclassified FAQs will be periodically posted to this BAA's DARPA Web page.
- After Receipt of Proposals – Prior to Selection: Government (PM/PCO) may communicate with offerors in order to understand the meaning of some aspect of the proposal that is not clear or to obtain confirmation or substantiation of a proposed approach, solution, or cost estimate.
- After Selection/Prior to Award: Government (PCO) may clarify aspects of the proposal and/or may conduct negotiations. Government (PM/COR/PCO) may clarify the Statement of Work or, in cases where only portions of the proposal are accepted, may discuss reductions to the scope to match the selected effort.
- Informal feedback for non selected proposals may be provided once the selection(s) are made.

Only a duly authorized Contracting Officer may obligate the Government



TAKE AWAY

- Submit proposals before the due date/time - Do NOT wait until the last minute to submit.
- Read and understand the BAA - Follow the BAA when preparing proposals.
- Be familiar with Government IP terms from the DFARS Part 227.
- Submit working/unprotected spreadsheet(s) in cost volume.
- The Contracting Officer is the only Government official authorized to obligate the Government.



Brandeis Teaming Site

To facilitate strong, collaborative teaming efforts and business relationships, a website has been established:

<https://www.schafertmd.com/darpa/i2o/brandeis/teaming/>

Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the DoD endorses the destination web site or the information and organizations contained therein, nor does DARPA or the DoD exercise any responsibility at the destination.

12 March 2015

Distribution Statement



Please direct all questions and
comments to:

Brandeis@darpa.mil

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Information Innovation Office

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March 12, 2015





UNCLASSIFIED

No classified discussions are authorized.

Do not discuss other DARPA programs



BRANDEIS Security - Points of Contact



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Sending UNCLASSIFIED Proposals

- Please address UNCLASSIFIED proposals to:
 - <https://baa.darpa.mil>

- Please address UNCLASSIFIED comments and questions to:
 - BAA Email: brandeis@darpa.mil (No proposals accepted)

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Brandeis Kick-Off Meeting

October 13, 2015

0800-0900	Check-In		Potomac Salons A and B
0900 - 0930	Welcome and Brandeis Briefing	John Launchbury, DARPA	Potomac Salons A and B
0930 - 0945	Technical Area 3 Vision	John Launchbury	
0945 - 1030	TA 3 - Mobile	Raytheon BBN (Invincea)	
1030 - 1045	Break		
1045 - 1130	TA 3 - Internet of Things	UC-Irvine (Honeywell)	Potomac Salons A and B
1130 - 1215	TA 3 - Enterprise	SRI (PSEG)	
1215 - 1330	Lunch Break <i>Towards a National Privacy Research Strategy</i>	(b)(6) Networking and Information Technology Research and Development (NITRD) program	(b)(6) Potomac Salons C and B
1300 - 1330	<i>TA 3 One-on-one meeting</i>	<i>UC-Irvine (Honeywell)</i>	<i>Lincoln Room</i>
1330 - 1500	Community Building		Potomac Salons A and B
1500 - 1515	Break		
1515 - 1530	Technical Area 2 Vision	John Launchbury	Potomac Salons A and B
1530 - 1600	TA 2 - Mobile	CMU (Tel Aviv Univ)	
1600 - 1630	TA 2 - Internet of Things	CMU	
1630 - 1700	TA 2 - Enterprise	PSEG (SRI)	
1700	Adjourn		
1700 - 1730	<i>TA 3 One-on-one meeting</i>	<i>SRI (PSEG)</i>	<i>Lincoln Room</i>

1730 - 1800	TA3 One-on-one meeting	Raytheon BBN (Invincea)	Lincoln Room
October 14, 2015			
0800-0830	TA 1 One-on-one meeting	UC-Berkeley (MIT, UMD)	Lincoln Room
0830-0900	TA 2 One-on-one meeting	CMU	Lincoln Room
0900-0915	Technical Area 1 Vision	John Launchbury	Potomac Salons A and B
0915 - 0945	TA 1	Stealth Software Technologies	
0945 - 1015	TA 1	UMass-Amherst (Duke, Colgate)	
1015 - 1045	TA 1	Galois (Univ of Bristol, Rutgers, GMU)	
1045 - 1100	Break		
1100 - 1130	TA 1	Iowa State (Princeton)	Potomac Salons A and B
1130 - 1200	TA 1	UC-Berkeley (MIT, UMD)	
1230-1330	<i>Lunch Break</i> Privacy, Security and Technology Development: The Legal Perspective	(b)(6)	Potomac Salons C and B
1300 - 1330	TA 2 One-on-one meeting	PSEG (SRI)	Lincoln Room
1330 - 1530	Collaborative Research Team (CRT) Forming Session		Potomac Salons A and B and Francis Scott Key Salons A and B
1530 - 1545	Break		
1545 - 1600	Technical Area 4 Vision	John Launchbury	

1600 - 1630	TA 4	Cybernetica (U of Tartu)	Potomac Salons A and B
1600 - 1700	TA 4	Galois (UMD, Hebrew Univ, UPenn, CRA)	
1700	Adjourn		
1700 - 1730	TA 1 One-on-one meeting	CMU (Tel Aviv Univ)	Lincoln Room
1730 - 1800	TA1 One-on-one meeting	UMass-Amherst (Duke, Colgate)	Lincoln Room
October 15, 2015			
0800-0830	TA 1 One-on-one meeting	Iowa State (Princeton)	Lincoln Room
0830-0900	TA 1 One-on-one meeting	Galois (Univ of Bristol, Rutgers, GMU)	Lincoln Room
0900 - 1000	Mobile Phone Privacy: Dead but not Forgotten	(b)(6) MIT	Potomac Salons A and B
		(b)(6) RAND Corporation	
1000 - 1030	Break		
1030 -1230	Collaborative Research Team meetings		Potomac Salons A and B and Francis Scott Key Salons A and B
1100 - 1130	TA 4 One-on-one meeting	Cybernetica (U Tartu)	Lincoln Room
1130 - 1200	TA 4 One-on-one meeting	Galois (UMD, Hebrew Univ, UPenn, CRA)	Lincoln Room
1230-1330	Lunch Break		

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1300 - 1330	<i>TA 1 One-on-one meeting</i>	<i>Stealth Software Technologies</i>	<i>Lincoln Room</i>
1330-1430	Collaborative Research Team meetings		Potomac Salons A and B <i>and</i> Francis Scott Key Salons A and B
1430 - 1530	Wrap Up	John Launchbury	Potomac Salons A and B
1530	<i>Adjourn</i>		

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From:

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Sent:

Friday, March 13, 2015 8:34 AM

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To:

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Subject:

BRANDEIS on NBC News

Signed By:

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Follow Up Flag:

Follow up

Flag Status:

Completed

Team,

Found this NBC News article on BRANDEIS this morning and thought you might like it.

<http://www.nbcnews.com/tech/security/darpa-unexpectedly-announces-program-improve-online-piracy-n322601>

V/R,

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From:
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To:
Subject:

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Monday, March 02, 2015 12:24 PM

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Brandeis Program - Special Notice posted

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All,

Please see the link below to the Special Notice, found on FedBizOpps.gov, announcing the upcoming Brandeis Program Proposers' Day. This new program is being led by Dr. John Launchbury.

https://www.fbo.gov/index?s=opportunity&mode=form&id=3c42e0a2e2ae9774171cdcf405f22ea3&tab=core&_cview=0

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Brandeis: Data Privacy



Brandeis, 1856–1941

Dr. John Launchbury
DARPA I2O Program Manager



HARVARD
LAW REVIEW.
VOL. IV. DECEMBER 15, 1890. NO. 5.



THE RIGHT TO PRIVACY.

Only on principles of private justice, social fitness,
and public policy, which, when applied to a new subject, create
a new right - much more when revealed and

"Right to Privacy"
and the menace of
the instantaneous camera

Approved for Public Release, Distribution Unlimited



We are not good at keeping private data private

THE WALL STREET JOURNAL.
U.S. EDITION Wednesday, January 14, 2015 As of 3:11 PM EST
Home World U.S. Business Tech Markets Market Data Your Money

CIO Journal.
CIO Report Consumerization Big Data Cloud Talent & Management Security

January 13, 2015, 7:42 PM ET

In Wake of Obama Cybersecurity Plan, CIOs Still Cautious on Info Sharing

“... its success will depend largely on making companies comfortable sharing sensitive information in the first place ...
Firms tend to agree that sharing is a good thing, but the reasons for not wanting to share are plenty. Many companies aren’t sure the information they share will be protected, or worry that it could put them out of regulatory compliance.
Some show concern about inadvertently sharing intellectual property with competitors, or fear the reputational risks associated with disclosing an attack. ”



Digital contrail:

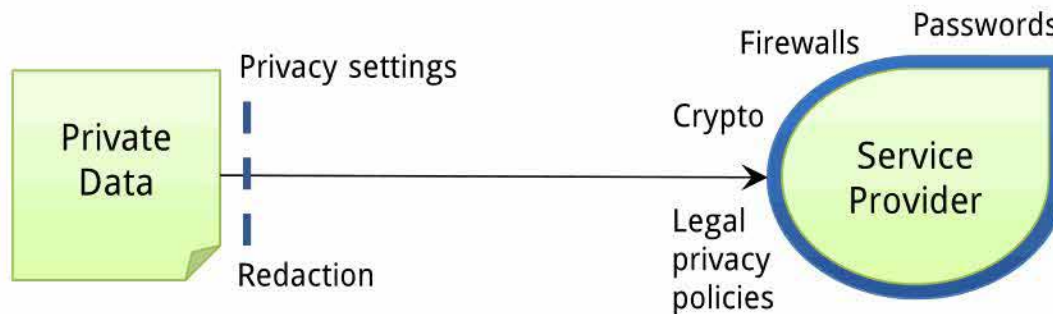
... phone, web, car, bank, store, home, travel, doctor, ...

Fundamental Problem

- I don't know **what** I'm revealing, **when**, and to **whom**
- My data world is so complex, I can't say **who** I want to access my data and for **what purpose**
- When I do release private data it is **gone forever**: I lose all control of it



How we try to protect private data today



Try to limit the release

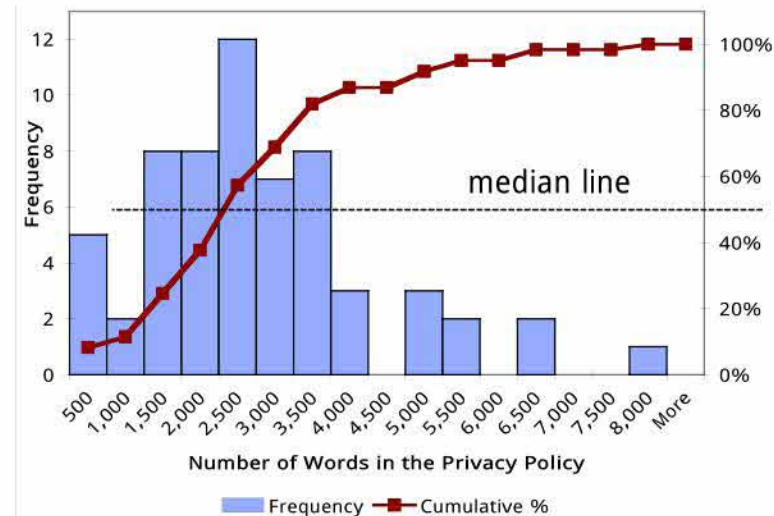
Trust the recipient

Example of redaction

Acme Employment Survey			
Name	[REDACTED]		
DOB	8/29/1978	Gender	F
Address	[REDACTED]		
City	[REDACTED]	Zip	97005
Salary	\$113,500	Job satisfaction	0

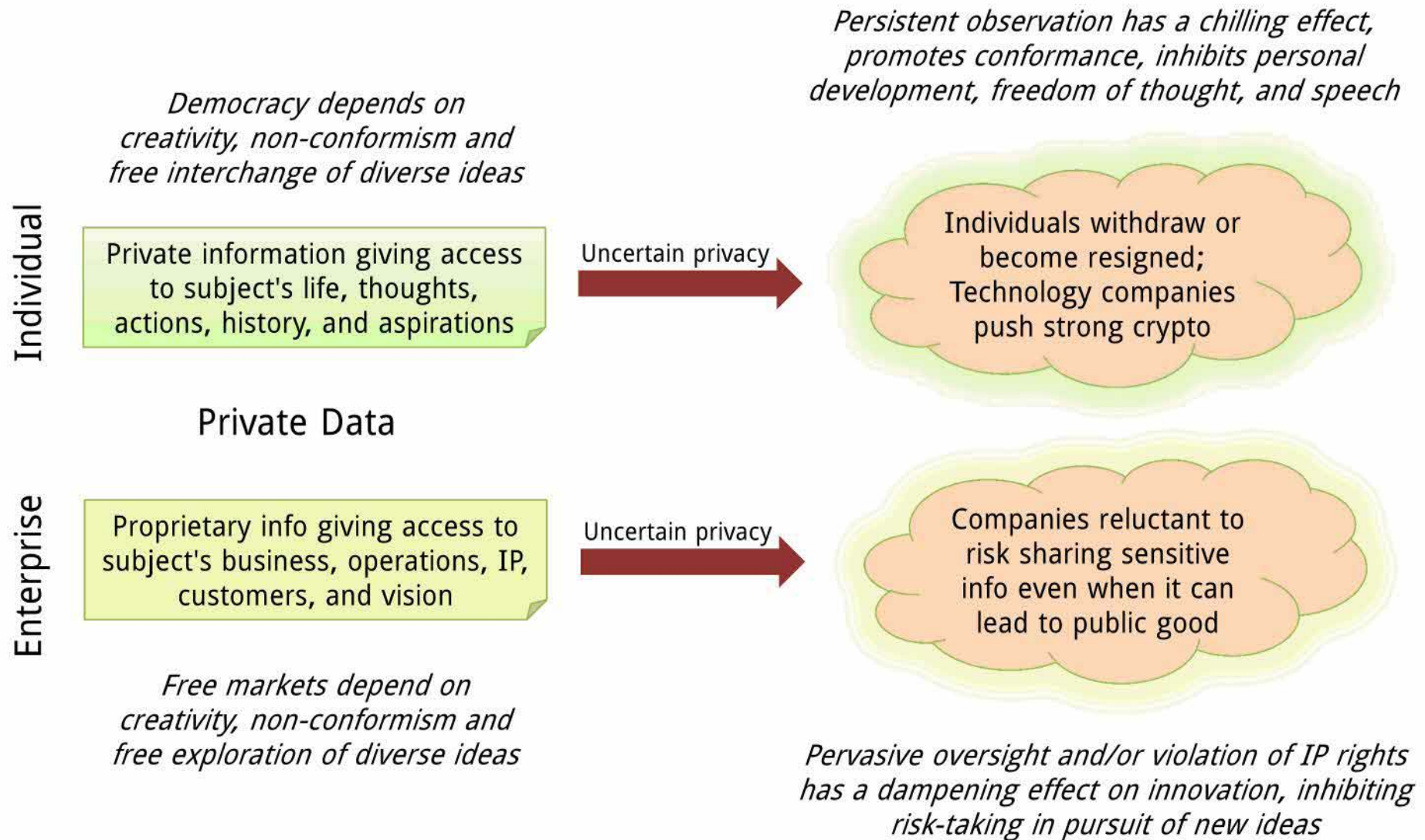
87% chance the individual is still identifiable!

Privacy policy sizes of 75 most popular sites





Effects of uncertain privacy: personally and collectively





The Brandeis Vision

Vision

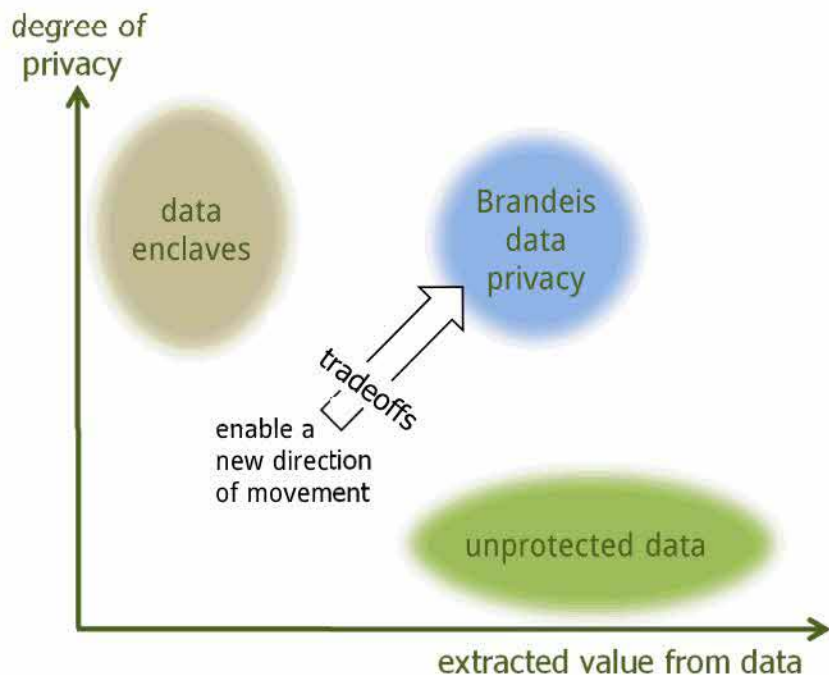
Break the tension between privacy and tapping the huge value of data

Goal

Learn how to build systems in which private data can only be used for the intended purpose and no other

develop transferrable tools and techniques

the data is protected against any other use

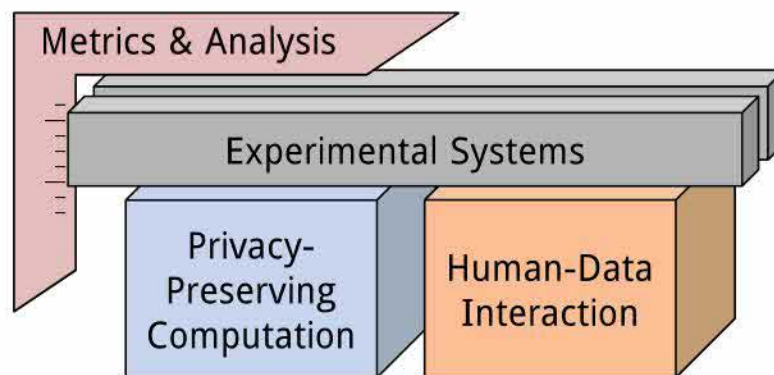


Potential for Impact

- Enable personal medicine, e.g. leveraging cross-linked genotype/phenotype data...
 - Enable smart cities, e.g. smart buildings, smart energy use, smart traffic controls...
 - Enable global data, e.g. every car sharing data on environment, weather, emergency situations...
 - Enable internet awareness, e.g. every company and device sharing network and cyber-attack data...
- ... all without violating privacy*



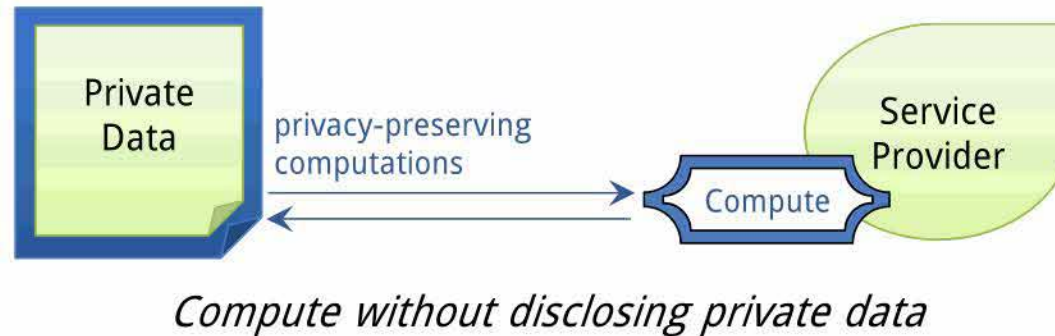
Approach: Protect data *before* you share it



Program Structure: Technical Areas



Privacy-Preserving Computation (TA1)



- Privacy-preserving computations
 - Using data in controlled environments
- Research challenges
 - Enable composability of mechanisms
 - Scale performance to practical systems
 - Develop more efficient algorithms

Examples of privacy-preserving computation

Method	Scale	Protection
Differential privacy	Big data	Results do not reveal info about inputs
Secure multiparty	Small data	Inputs never revealed beyond results
Secure data-base query	Big data	Untouched data and query not revealed
Data-rights management	Small data	Application-specific by remote attestation

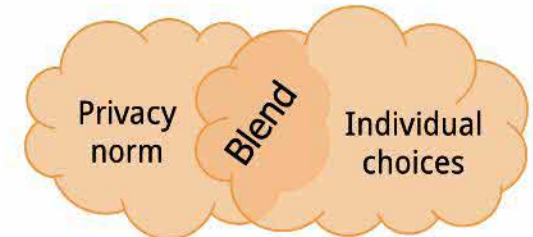


Human-Data Interaction (TA2)



Research challenges

- Span the gap between human intent and actionable policy
 - Enable expression at the human level to reflect purpose, risk, and benefit
- Create interfaces for capturing privacy intentions
 - Convey the privacy implications in the data space
 - Include embedded devices (no “interfaces”)
- Develop effective control of the data space
 - Machine-learned automation across distributed devices
 - Merge-able privacy models for data lifetime and computation



Merging probabilistic privacy models

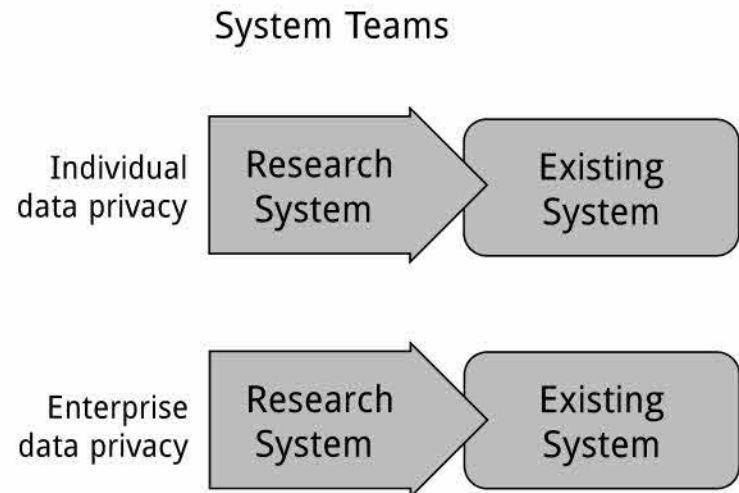


Experimental Systems (TA3)

Build privacy-aware systems

Research challenges (for each system setting)

- Understanding what privacy-sensitive information flows are needed
- Eliminating gratuitous data leakage from the constituent subsystems
- Identifying, adapting, and incorporating appropriate privacy-protecting computations (TA1 technologies)
- Managing complexity of multiple data sources and contextual uses (TA2 technologies)
- Enabling retrofit into existing systems

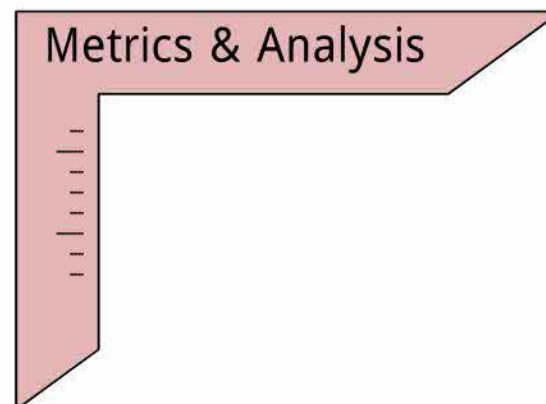




Metrics and Analysis (TA4)

Assess the efficacy and cost of privacy technologies

- Define methods for measuring system privacy
 - Degree and impact of information released
 - Increase in computational time
 - Degradation of accuracy of results
 - Invasiveness of data controls
 - Relationship to Fair Information Practice Principles (FIPPs)
- Develop tools for measuring system privacy
 - Apply tools to measure privacy of experimental systems
 - Provide feedback to system teams
 - Privacy insecurities and violations
 - Relationship with Human-Data Interaction (HDI) choices



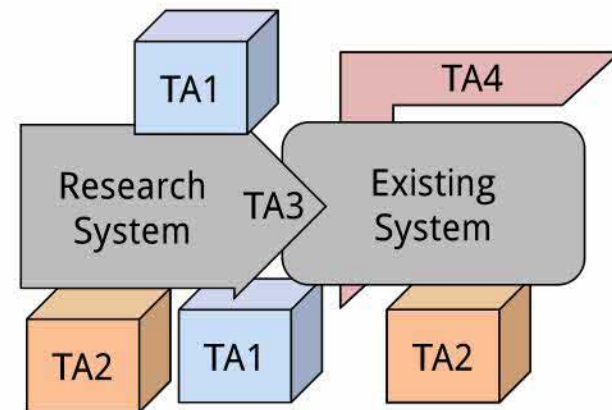
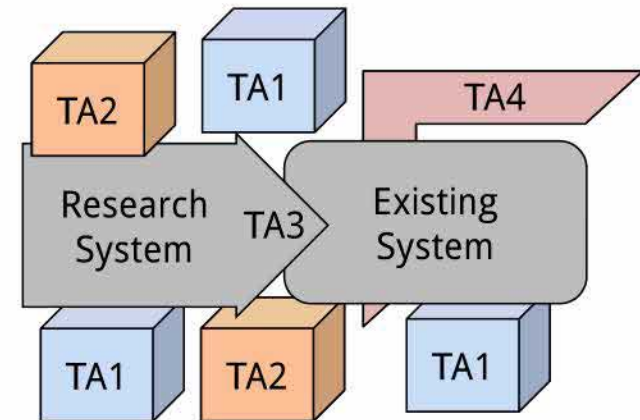


Collaborative Research Teams

Brandeis goal:

Learn how to build privacy-preserving systems

- Multi-performer research teams
 - Closely-coupled collaborative research
 - Performers tune their research to the needs of the collaborative research team
 - Team succeeds collectively not individually
 - Individual specialty research within teams

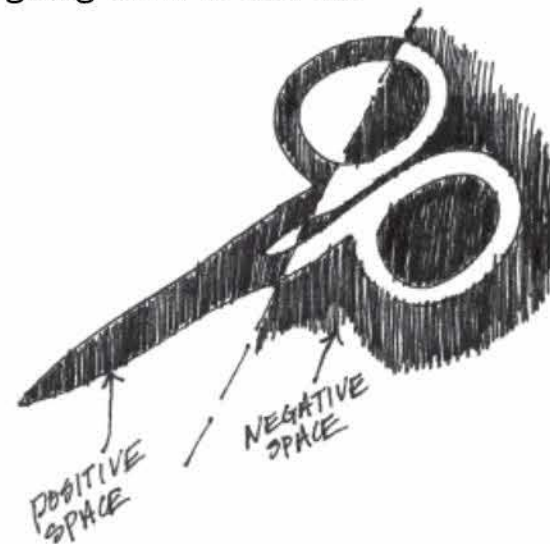


(number of TA components is illustrative only)



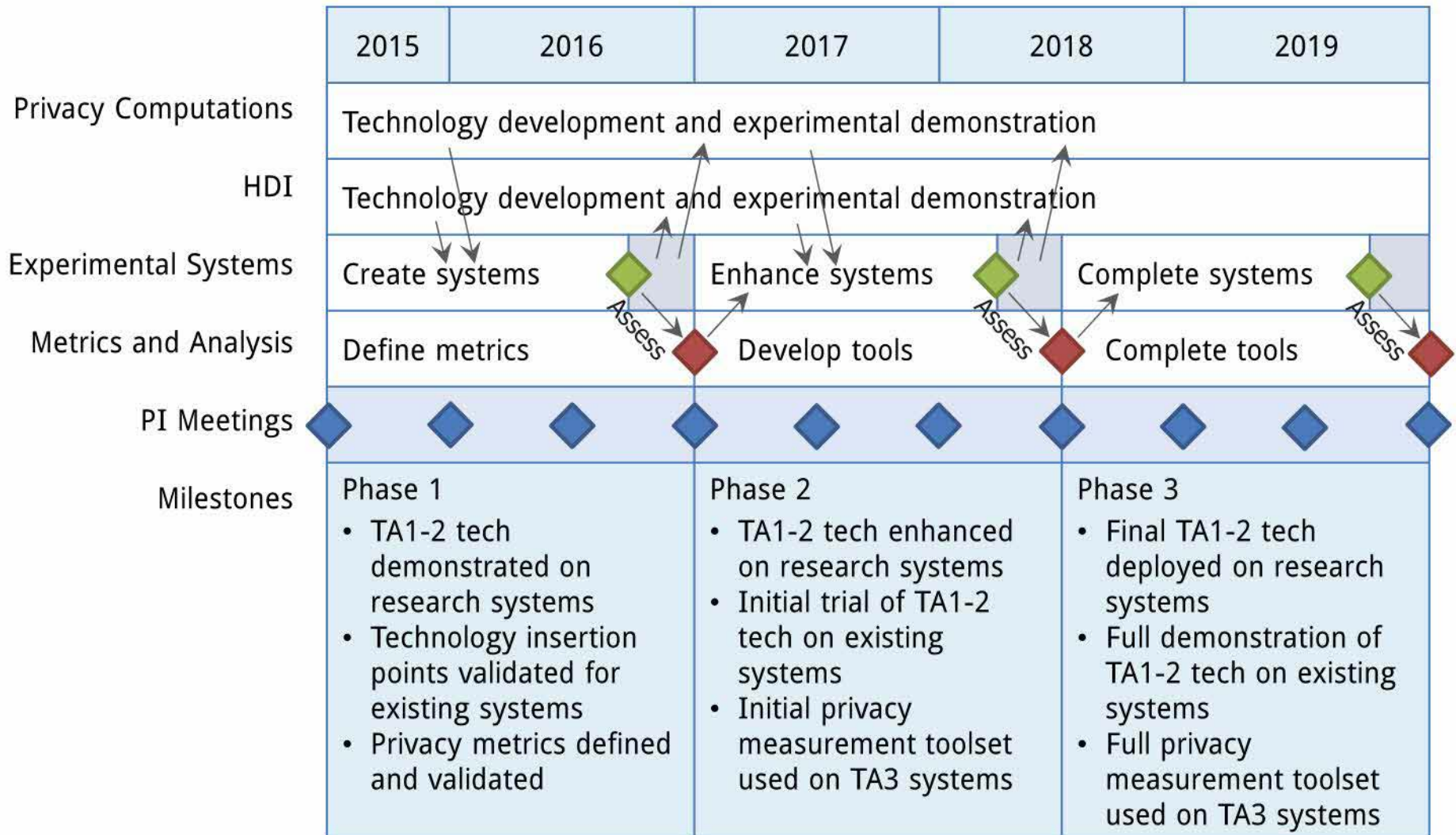
Characterizing the Negative Space: Brandeis is not ...

- Statically-published data sets
 - Separate annual open competition (with prizes) to draw in ongoing state-of-the-art
 - Transform data to enable specified queries and no others
- Online anonymity
 - This isn't the next TOR, for example
 - Focus on data willingly (or statutorily) released
- Cybersecurity
 - Not hardening platforms by removing 0-days
 - Think honest-but-curious adversary, though more stringent models may be interesting
- Side-channel attacks
 - Timing, deep inference, etc.
- Privacy science or Cryptographic science
 - Motivation is *building systems*, not advancing science per se
 - Though engineering-needs may drive developments in the science
- Human-factors experimentation
 - Leverage existing understandings
 - Focus is on spanning the gap from human thinking to what machines need
- Societal privacy policies or regulation
 - The lessons we learn will create new options for society to consider





Notional Schedule





Proposal Mechanics

Proposals

- One technical area per proposal
 - Opportunity to describe Team Concept
- Loose teaming
 - Assumptions about other TAs
 - Dependencies on other capabilities
 - Opportunities to include other capabilities

All dates approximate:

Date	Event
Mar 11	BAA Published
Mar 12	Proposers Day
Apr 29	Proposals due
June 5+	Award notifications
Sep 1	Program start
Sep 15-17	Kickoff PI meeting



Recommendations Regarding the Technical Proposal

- Executive Summary (~1 page)
 - Give a *brief overview* of what you expect to be able to accomplish and how
 - Help frame the proposal for the reviewer to set their expectations of what they will see
 - Have it be effective to refresh memory when a reviewer comes back to your proposal
- Goals and Impact
 - Be specific about *what* you expect to accomplish, *what capabilities* it will provide
- Collaborative Research Team Concept
 - Describe how you see your new capabilities fit within a multi-performer team
- Technical Plan
 - Describe your *technical approach* and explain *how* this will accomplish the capability
 - Help the reviewer understand why you are likely to succeed
- Personnel, Management, Capabilities
 - Include a table of key personnel and explain how proposed team will work internally
 - Include relevant details only (not full resumes)
- Statement of Work, Schedule, Milestones
 - Describe what you expect to work on, when you will work on it, and what it should produce
 - Give the reviewer confidence regarding your internal project planning

Clarity and brevity will be highly valued!

Assume the context of the BAA and the Technical Area (don't regurgitate this)

Place your proposed project in this context, and don't repeat yourself (25 pages only)

Working Lunch with DARPA

...cybersecurity, online privacy, revolutionary innovation,
and hacking into your moving automobile...

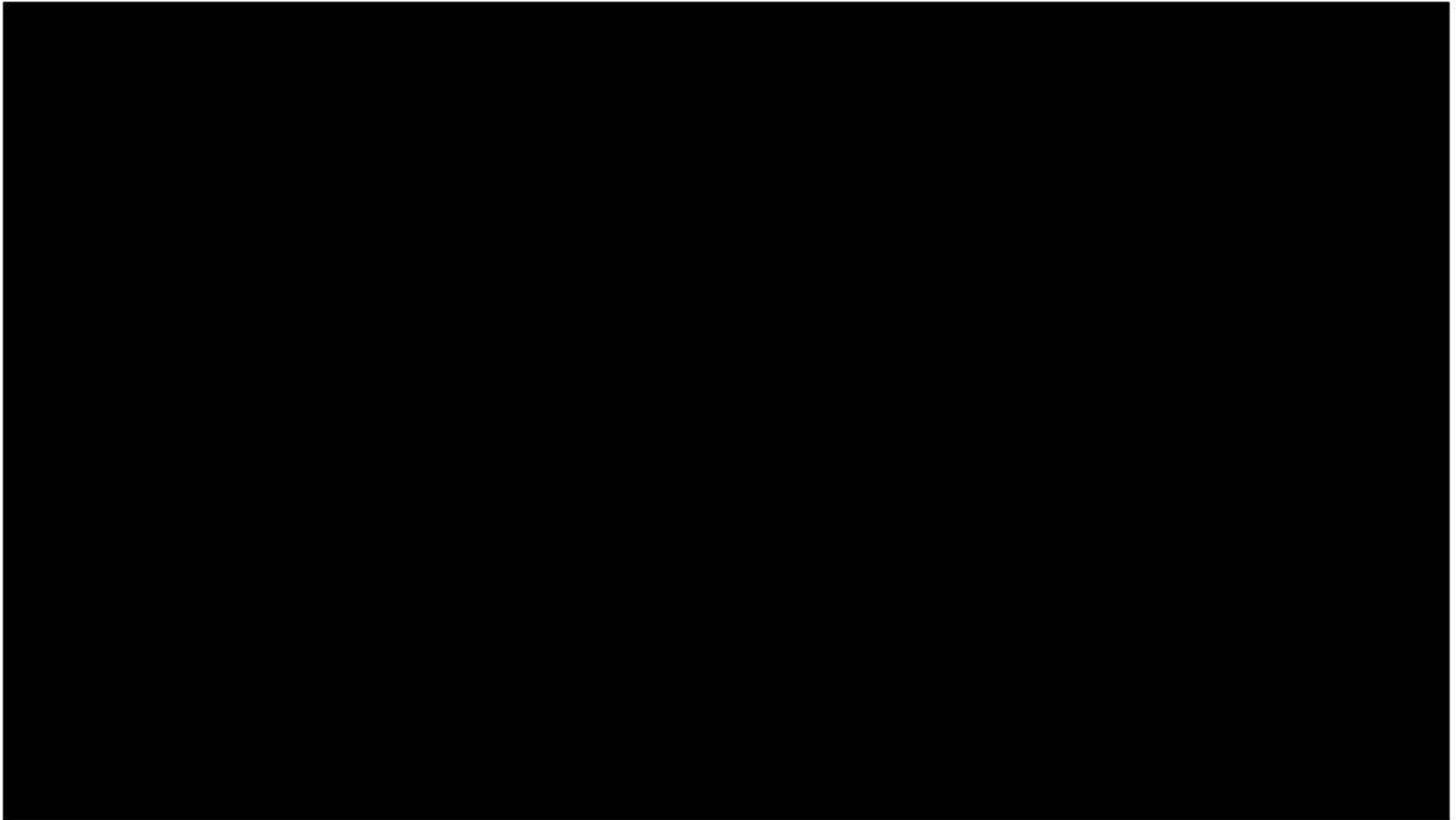
Dr. John Launchbury
Program Manager
Information Innovation Office



Approved for Public Release, Distribution Unlimited



"DARPA Dan", 60 Minutes, CBS





Many Remote Attack Vectors



SCADA Systems



Source: Laing O'Rourke



Source: Dept. of Energy

Medical Devices



Source: www.seekingpha.com



Source: www.medtechbusiness.com

Computer Peripherals



Source: HP



Source: www.buy.com



Source: www.bagitech.com

Approved for Public Release, Distribution Unlimited



Securing Cyber-Physical Systems: State of the Art

Cyber Systems

- Anti-virus scanning, intrusion detection systems, patching infrastructure
- Not convergent with the threat
- Focused on known vulnerabilities

Control Systems

- Air gaps & obscurity

Forget the myth of the air gap – the control system that is completely isolated is history.
– *Stefan Woronka, 2011, Siemens*

October 2010 Vulnerability Watchlist

Vulnerability Title	Fix Avail?	Date Added
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1/3 of the vulnerabilities are in security software!

- Trying to adopt cyber approaches, but technology is not a good fit:
 - Resource constraints, real-time deadlines
 - Extreme cost pressures
 - Patches may have to go through lengthy verification & validation processes
 - Patches could require recalls

We need a *fundamentally different* approach



We are not good at keeping private data private

THE WALL STREET JOURNAL.
U.S. EDITION Wednesday, January 14, 2015 As of 3:11 PM EST
Home World U.S. Business Tech Markets Market Data Your Money

CIO Journal.

CIO Report Consumerization Big Data Cloud Talent & Management Security

January 13, 2015, 7:42 PM ET

In Wake of Obama Cybersecurity Plan, CIOs Still Cautious on Info Sharing

“... its success will depend largely on making companies comfortable sharing sensitive information in the first place ...
Firms tend to agree that sharing is a good thing, but the reasons for not wanting to share are plenty. Many companies aren’t sure the information they share will be protected, or worry that it could put them out of regulatory compliance.
Some show concern about inadvertently sharing intellectual property with competitors, or fear the reputational risks associated with disclosing an attack.”



Digital contrail:

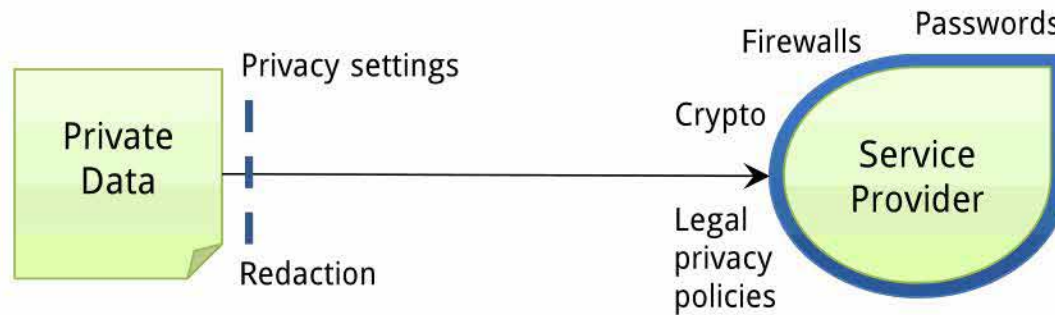
... phone, web, car, bank, store, home, travel, doctor, ...

Fundamental Problem

- I don't know **what** I'm revealing, **when**, and to **whom**
- My data world is so complex, I can't say **who** I want to access my data and for **what purpose**
- When I do release private data it is **gone forever**: I lose all control of it



How we try to protect private data today



Try to limit the release

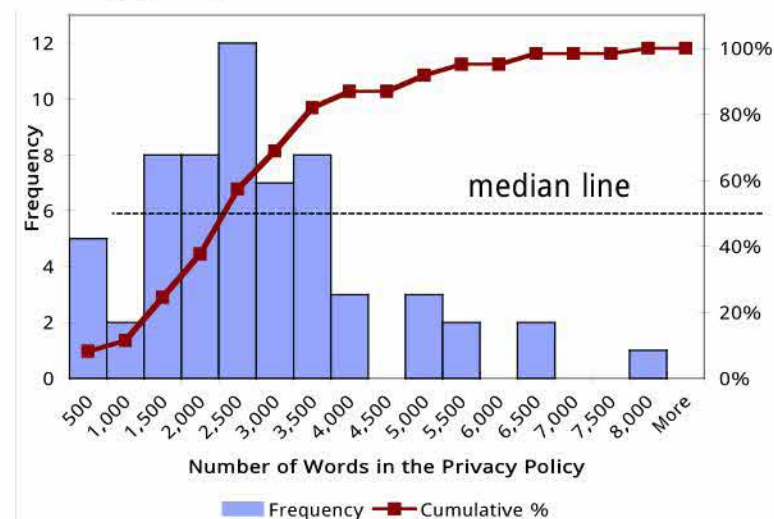
Trust the recipient

Example of redaction

Acme Employment Survey			
Name	[REDACTED]		
DOB	8/29/1978	Gender	F
Address	[REDACTED]		
City	[REDACTED]	Zip	97005
Salary	\$113,500	Job satisfaction	0

87% chance the individual is still identifiable!

Privacy policy sizes of 75 most popular sites

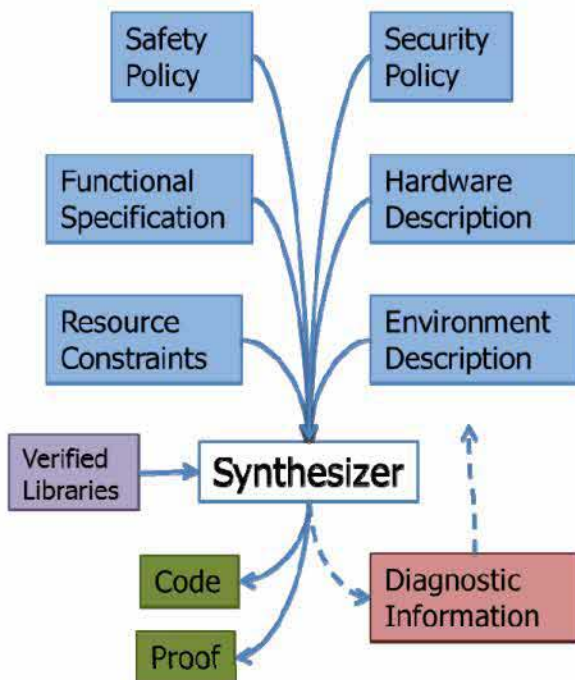


We need a *fundamentally different* approach

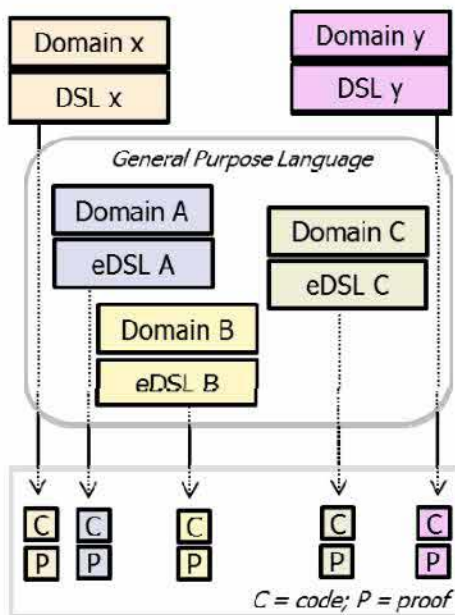


Clean-Slate Methods for High-Assurance Software

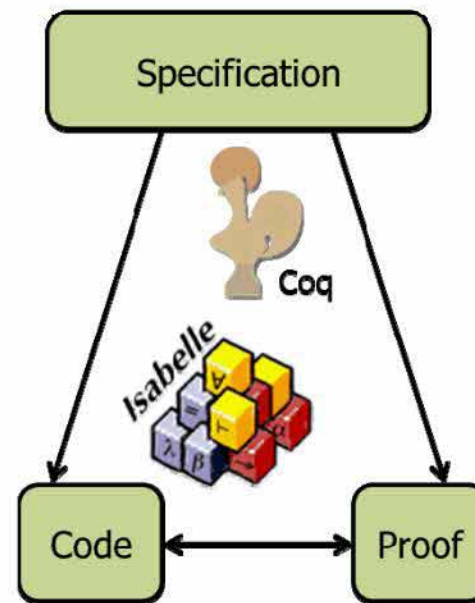
Code Synthesis



Domain Specific Languages (DSLs)



Interactive Theorem Prover as PL



High Assurance: Ensuring Correctness, Safety, Security



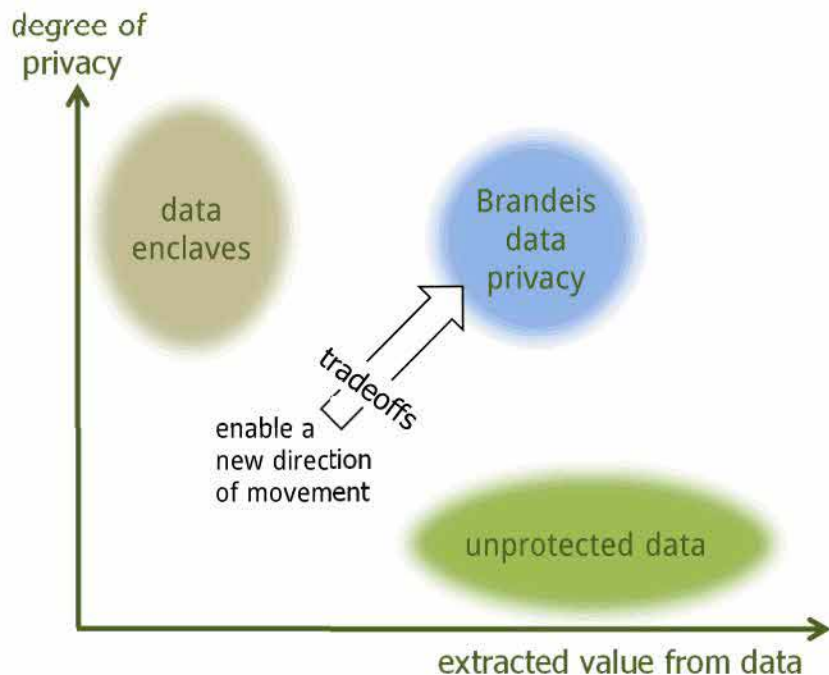
The Brandeis Vision

Vision

Break the tension between privacy and tapping the huge value of data

Goal

Learn how to build systems in which private data can only be used for the intended purpose and no other



develop transferrable tools and techniques

the data is protected against any other use

Potential for Impact

- Enable personal medicine, e.g. leveraging cross-linked genotype/phenotype data...
 - Enable smart cities, e.g. smart buildings, smart energy use, smart traffic controls...
 - Enable global data, e.g. every car sharing data on environment, weather, emergency situations...
 - Enable internet awareness, e.g. every company and device sharing network and cyber-attack data...
- ... all without violating privacy*

Protect Data *Before* You Share It



www.darpa.mil

Broad Agency Announcement

Brandeis

DARPA-BAA-15-29

March 11, 2015



Defense Advanced Research Projects Agency

Information Innovation Office

675 North Randolph Street

Arlington, VA 22203-2114

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PART I: OVERVIEW

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Information Innovation Office (I2O)
- **Funding Opportunity Title:** Brandeis
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** DARPA-BAA-15-29
- **Catalog of Federal Domestic Assistance Numbers (CFDA):** 12.910 Research and Technology Development
- **Dates**
 - Posting Date: March 11, 2015
 - Proposers' Day: March 12, 2015
 - Proposal Due Date: April 29, 2015, 12:00 noon (ET)
 - BAA Closing Date: April 29, 2015, 12:00 noon (ET)
- **Anticipated Individual Awards:** DARPA anticipated multiple awards in each of the technical areas, 1-4.
- **Total Funding Available for Award:** DARPA anticipates making multiple awards under this BAA, which has a total anticipated funding amount of approximately \$60M.
- **Types of Instruments that May be Awarded:** Procurement contracts, grants, cooperative agreements or other transactions
- **Technical POC:** John Launchbury, Ph.D., Program Manager, DARPA/I2O
- **BAA Email:** Brandeis@darpa.mil
- **BAA Mailing Address:**

DARPA/I2O
ATTN: DARPA-BAA-15-29
675 North Randolph Street
Arlington, VA 22203-2114
- **I2O Solicitation**

Website: http://www.darpa.mil/Opportunities/Solicitations/I2O_Solicitations.aspx

PART II: FULL TEXT OF ANNOUNCEMENT

I. FUNDING OPPORTUNITY DESCRIPTION

DARPA is soliciting innovative research proposals in the area of data privacy. Proposed research should investigate innovative approaches that enable revolutionary advances in privacy science or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

This broad agency announcement (BAA) is being issued, and any resultant selection will be made, using procedures under Federal Acquisition Regulation (FAR) 35.016. Any negotiations and/or awards will use procedures under FAR 15.4 (or 32 CFR 22 for grants and cooperative agreements). Proposals received as a result of this BAA shall be evaluated in accordance with evaluation criteria specified herein through a scientific review process.

DARPA BAAs are posted on the Federal Business Opportunities (FBO) website (<http://www.fbo.gov/>) and, as applicable, the Grants.gov website (<http://www.grants.gov/>).

The following information is for those wishing to respond to this BAA.

Introduction

The Brandeis Program aims to enable individuals, enterprises, and U.S. government agencies to keep private and/or proprietary information private. Its purpose is to understand how to build information systems that can ensure *private data can only be used for its intended purpose and no other*.

Background

Privacy is critical to a free society. Democracy and free enterprise both depend on creativity, non-conformism and free interchange of diverse ideas. The threat of persistent observation has a chilling effect on both, promoting conformance and inhibiting personal development or risky innovation. The right to privacy, as Louis Brandeis expounded in 1890, is a consequence of understanding that harm comes in more ways than just the physical. He was reacting to the ability of the new “instantaneous camera” to record personal information in new ways. Since then, the ability of technology to collect and share information has grown beyond all expectation. What we’ve discovered as a society is that this is both a good and a bad thing.

The ability to analyze large amounts of aggregated personal data can help businesses optimize online commerce, medical workers address public health issues, and governments interrupt terrorist activities. However, numerous recent incidents involving the disclosure of data have heightened society’s awareness of the vulnerability of private information within cyberspace. Moreover, there is so much data that it is currently infeasible for individuals or enterprises to control it in a meaningful way with the information technologies available today. The White House has made cybersecurity a priority and has launched numerous initiatives to enable the

safe and effective sharing of information (especially information related to cyber threats) to increase the nation’s ability to protect itself and to thwart any adversary’s ability to shut down networks, steal trade secrets, or otherwise invade privacy.

Finally, U.S. national security increasingly requires mutually sharing information with coalition partners in order to collective benefits of regional security. Even at the unclassified level, such mutual sharing will require strong assurance that shared information is only used as intended.

The Brandeis program seeks to develop the technical means to protect the private and proprietary information of individuals and enterprises. Some of the parallels between individual privacy and enterprise privacy are outlined in the following table.

PRIVACY	INDIVIDUAL	ENTERPRISE (E.G., GOVT., CORPORATION)
Kind of information	Private information giving access to a subject's life, thoughts, words, actions, history, and aspirations.	Proprietary information giving access to a subject's business, operations, intellectual property, customers, and vision.
Legal basis in the USA	4th Amendment as modified by statute and courts. Privacy now attaches to the person rather than the place as follows: (1) does the person have a reasonable expectation of privacy, and (2) does society accept this expectation?	Many legal protections for corporations including trade secrets, non-disclosure agreements, and Digital Millennium Copyright Act (DMCA) amongst others. Protections for government include information classifications.
Defining of a relationship	People tell their doctors or therapists things they do not want anyone else to know; a married couple behave differently when observed together than when alone.	Corporations share information with partners under non-disclosure agreements (NDA); governments share information under security cooperation agreements; handling caveats limit dissemination.
Violations	Invasion of privacy when unpublished information is collected without the consent of the subject, when there is no overriding, legitimate public interest in collecting and using this information.	Industrial espionage is an act of theft. Unauthorized collection and release of corporate information requires legitimate public interest. Unauthorized release of government information is a crime.
Lack of privacy	Democracy depends on creativity and free interchange of diverse ideas. Constant observation has a dampening effect on individuality. It promotes conformance and inhibits personal development, freedom of thought, and speech.	Free markets depend on creativity, non-conformism and free exploration of diverse ideas. Pervasive oversight and violation of IP rights both have a dampening effect on innovation, inhibiting risk-taking in pursuit of new opportunities.
Impact	The more widely sensitive information becomes disseminated, the greater the danger of error, misunderstanding, discrimination and prejudice.	Release to competitors destroys markets. Leakage to regulators may lead to costly investigations even if no fault. Leaks can lead to public relationship problems.
Effect of uncertain privacy	Technology companies independently build unbreakable cryptographic protections on products; already in messaging, soon in email and beyond.	Companies/coalition partners are reluctant to risk sharing sensitive information even when it can lead to enhanced security or other public good.

Table 1: *Nature of Individual Privacy and Enterprise Privacy*

Currently, the predominant methods for protecting private information fall broadly into two categories: filtering the release of data at the source, or trusting the user of the data to provide diligent protection. Both have serious challenges.

Filtering data at source is problematic. For example, redacting specific elements of personally identifying information is fragile at best. Apparently innocuous information sets can often be cross-correlated with public information to undo the redaction, and so re-identify the individual. For example, it has been estimated that birthdate, zip code and gender are sufficient to identify 87% of Americans by name.¹

On the other side of the equation, trusting an aggregator and other data recipients to diligently protect their store of data is also problematic. There have been numerous examples within the last year of how this has failed. For example, as many as 80 million social security numbers may have been stolen from a health insurer, terabytes of sensitive corporate data (including personnel records) were exfiltrated from a movie studio, and many highly personal images were illegitimately downloaded from cloud services.

Currently, we do not have effective mechanisms to protect data ourselves, and the people with whom we share data are often not effective at providing adequate protection.

Program Vision and Goal

The vision of the Brandeis program is to break the tension between (a) maintaining privacy and (b) being able to tap into the huge value of data. Rather than having to balance between them, Brandeis aims to build a third option, enabling safe and predictable sharing of data in which privacy is preserved. Specifically, Brandeis will develop tools and techniques that enable us to *build systems in which private data may be used only for its intended purpose and no other.*

The potential for impact is dramatic. Assured data privacy can open the doors to personal medicine (leveraging cross-linked genotype/phenotype data), effective smart cities (where buildings, energy use, and traffic controls are all optimized minute by minute), detailed global data (where every car is gathering data on the environment, weather, emergency situations, etc.), and fine grained internet awareness (where every company and device shares network and cyber-attack data). Without strong privacy controls, every one of these possibilities would face systematic opposition.

Program Description

The goal of the Brandeis program is to develop tools and techniques that enable systems to be built in which private data may be technologically protected so that it can only be used for its intended purpose and no other. It seeks to restructure our relationship with data by shifting the mechanisms for data protection to the data owner rather than the data user. The primary

¹ L. Sweeney, *Simple Demographics Often Identify People Uniquely*. Carnegie Mellon University, 2000.

focus of the Brandeis program is to protect data that is knowingly provided to a third party, as opposed to data collected as a byproduct of interacting with the network or a system.

The program has four technical areas (TAs):

- TA1. Privacy-preserving Computation
- TA2. Human Data Interaction (HDI)
- TA3. Experimental Systems
- TA4. Metrics and Analysis

Performers in all four of the TAs will be required work cooperatively in the context of tightly coupled collaborative research teams created under the general oversight of the Government. Each collaborative research team will be centered around one of the TA3 Experimental Systems and may contain multiple TA1, TA2, and TA4 performers. Performers in TA1 and TA2 will be required to tune their research activities to support the needs of the experimental systems being developed by the TA3 performer on their collaborative research team. Similarly, performers in TA4 will use the TA3 experimental systems being developed within their team as a test bed to exercise their metrics and analysis tools. In turn, TA3 performers will tune their plans for their experimental systems to optimize the research opportunities for the TA1, TA2, and TA4 performers to the extent that such flexibility makes sense in the context of the systems being built.

Proposers may submit proposals for any or all of the technical areas, and multiple awards are envisioned in each TA. However, each proposal may only address a single technical area. This is being done in an effort to maximize the flexibility the Government has in creating collaborative research teams that hold the greatest promise for breakthrough approaches. Because no TA will succeed on its own, proposals will include a Collaborative Research Team Concept section that describes how the work would fit within the context of potential collaborative research teams (see Section IV.B.a.v). This section provides the opportunity to outline the dependencies between the work proposed and work in other technical areas. The Collaborative Research Team Concept section should describe:

- a) the working assumptions about features or capabilities their proposal *requires* from any of the other TAs; and
- b) other additional features or capabilities that may be accommodated within the scope of their proposed approach.

The Brandeis program is structured as a 4.5-year effort, split into three 18-month phases. Each phase will result in the demonstration of experimental systems that show privacy technologies at work. As the Brandeis program advances through its three phases, the breadth and completeness of the experimental systems will grow. In order to promote collaborative research and sharing of results across the entire Brandeis program, no programmatic down-select is anticipated, though the Government reserves the right to make funding changes throughout the life of the program as it sees fit.

Technical Areas

This section contains more detailed descriptions of the research work being sought in each of the technical areas.

TA1: Privacy-Preserving Computation

There have been a number of research efforts over the last decade focusing on mechanisms whereby private data may be used in computation without being revealed. Many of these mechanisms require active engagement by the data owner, including techniques such as differential privacy, secure multiparty computation, secure database queries, and remote attestation of protected computation environments. The research has been promising, but to date these techniques suffer from significant practical limitations in flexibility, scalability and performance. The Brandeis program seeks to address the practical limitations of computational privacy mechanisms so that they may be used in practical systems.

The key research challenges include discovering how to:

- Enable privacy-preserving computation techniques to be used in concert with each other, so that future system designers can use them as flexible building blocks.
- Scale the techniques to data sizes that occur in practical situations.
- Have the techniques be sufficiently efficient to be used in practice, including developing mechanisms to leverage a small amount of private computation for a large computational effect.

Note that TA1 is primarily about developing methods for *building systems based on privacy-preserving computational techniques* rather than developing the techniques themselves, though advancing the techniques themselves is expected to be a necessary element of the research. Consequently, proposers in TA1 should propose specific approaches for making methods of privacy-preserving computation usable in real systems, including describing how their research may be tuned to the needs of a larger collaborative research team. It may benefit TA1 proposers to have thought about how their work will fit with potential TA3 systems when constructing their proposal.

TA2: Human Data Interaction (HDI)

As a discipline, computer science has extensively explored Human Computer Interaction (HCI) to understand how best to interact with computing systems. Today, however, our interfaces are becoming more and more invisible, so the more pertinent emerging question concerns how to interact with the clouds of *data* surrounding us. Hence *Human Data Interaction (HDI)* is starting to emerge as a discipline,² and it becomes more significant as the data owner gains the responsibility for control of their data and its use.

To date, work in HDI has focused largely on social, policy, and legal mechanisms. In the

² <http://hdiresearch.org>

Brandeis program, technologies will be developed that help a data owner to make choices about data use. TA2 research will direct significant emphasis on developing tools and techniques which give the data owner a scalable capability to decide how their data should be used. It is anticipated that performers will explore how users can come to understand, interact with and control data in their systems and in cyberspace, and will develop tools and technology to help users efficiently and effectively manage the privacy/benefit tradeoff.

Research challenges in HDI include discovering how to:

- Span the gap between human intent and actionable policy, so that humans can control their data use by expressing high-level intentions (e.g., “I don’t want my data to be used against me”) that reflect purpose, risk, and benefit.
- Create interfaces for capturing privacy intentions that convey the privacy implications in the data space and that include embedded devices having no interfaces in the traditional sense.
- Develop effective control of the data space that may involve machine learning and automated agents across multiple distributed devices, including merging privacy models from peers or social norms.

Proposers in TA2 should propose specific approaches for addressing HDI in practice, including describing how their research will be tuned to the needs of a larger collaborative research team. It may benefit TA2 proposers to have thought about how their work will fit with potential TA3 systems when constructing their proposal.

TA3: Experimental Systems

The goal of the Brandeis program is to learn how to build privacy-aware systems. Technical Area 3 (TA3) is where this finds practical fulfillment. The combination of privacy-preserving computation (TA1) and HDI (TA2) will dramatically increase our ability to protect data at source, and TA3 will provide the platforms on which to test these ideas in practice. The needs of the experimental systems will help shape the particular TA1 and TA2 developments, and the lessons learned in these practical settings will feed back into research directions.

Each TA3 proposal should propose two related systems:

1. Research System – This should have minimal legacy requirements so that it can naturally enable clean-slate development by the research teams. A Research System should also provide opportunities for multiple types of data privacy (e.g., large data, small data, multiple participants, etc.) and present rich challenges in managing privacy choices.
2. Existing System – This will provide a legacy challenge of requiring privacy technologies to be inserted in the context of existing components. An Existing System should exhibit a compelling need for privacy technologies, especially if strong assurances about privacy can enable significant new capabilities in the system.

The Research System and the Existing System should be clearly related in that research carried out in the context of the Research System would naturally be applicable to the Existing System, albeit in a modified and possibly more restricted form.

Proposers in TA3 may propose systems that have a privacy focus either on individual data privacy or on (collective) enterprise data privacy, or a combination of both. Open source (non-proprietary) systems are preferred, and especially so for any Research System. Experimental systems that do not contain any actual personal information are strongly preferred. However, if an experimental system unavoidably contains personal information, then the TA3 proposal should (a) demonstrate how the information will be shielded from the rest of the cooperative research team, and (b) must include any required institutional review board (IRB) processes.

As each TA3 system team will coordinate their work with TA1 and TA2 performers to migrate their technology into both the Research System and the Existing System, a TA3 proposer should describe in concept how their systems will be tuned to the opportunities of the TA1 and TA2 research performers in their development team, as well as how the lessons learned from these systems will be used to feed back into the specific research directions for TA1 and TA2.

TA4: Metrics and Analysis

Very little is known today about how to measure the privacy of a system, especially when it involves multiple semi-independent components interacting in the context of other information. Performers in TA4 will engage in research to develop a set of metrics that can be used to quantify the privacy benefits and costs of a system, and will develop analysis tools to assess the efficacy and cost of the privacy technologies as they are used by the TA1, TA2 and TA3 research teams in the experimental systems.

Research challenges in metrics and analysis include discovering how to:

- Quantify the degree of privacy maintained by the system. For example, this may depend on the quantity and impact of information released over time. There may also need to be partly qualitative methods, relating the privacy measures to descriptions such as the Fair Information Practice Principles (FIPPs), for example.
- Quantify the “privacy tax”, i.e., balancing the increase in computational time, memory, and storage requirements against the degradation of accuracy of results for any given level of privacy.
- Quantify the quality of the data controls in terms of precision and invasiveness and how they relate to the HDI choices of the user.

TA4 proposals should describe approaches for developing privacy metrics and for mechanizing those metrics into automated or semi-automated tools that can be used for assessing system privacy. TA4 proposals should also describe why these tools will be effective when applied to the TA3-style systems, and how they will provide “privacy-debugging” feedback to the system teams. It may benefit TA4 proposers to have potential TA3 systems in mind when constructing their proposal.

Schedule/Milestones

Proposers should submit a schedule that is consistent with the maturity of their approaches and the risk reduction required for their concepts. These schedules will be synchronized across performers, as required, and monitored/ revised as necessary throughout the Brandeis

program's period of performance. Subject to the availability of funding, the program is intended to last for 54 months (4.5 years), and is structured as three 18-month phases. For budgeting purposes, use September 1, 2015, as an estimated start date.

The Government will specify the locations for program reviews, Principal Investigator (PI) meetings, and other events. In general, for budgeting travel, assume that program reviews will be held either in Washington, D.C., or at the performer's location once a year. It is currently anticipated that the program kickoff meeting will occur in mid-September 2015, after contract signing. *It is strongly encouraged that any subcontracts are fully negotiated prior to proposal submission.*

PI meetings will be held approximately every 6 months. For planning purposes, assume the locations split between the East and West Coasts of the United States. The goals of the PI meetings will be to: (a) enhance coordination across performer teams and particularly within the larger tightly-coupled research teams; (b) demonstrate accomplishments of each phase; and (c) review plans for the upcoming period. The PI meetings will have registration fees that are currently estimated to be \$350 per person, in addition to travel and lodging costs.

In addition to occasional site visits, monthly or bi-monthly teleconference meetings will be held with each PI to enhance communications with the Government team. Should important issues arise between program reviews, the Government team will be available to support informal interim technical interchange meetings.

Milestones

In broad terms, the milestones of the three phases are expected as follows:

- **Phase 1:** TA1 and TA2 technology are demonstrated on a TA3 Research System. Future technology insertion points are validated for the TA3 Existing Systems. TA4 privacy metrics are defined and validated by hand on the TA3 systems.
- **Phase 2:** Enhanced versions of TA1 and TA2 technology are demonstrated on a TA3 Research System. An initial trial of TA1 and TA2 technology is demonstrated on a TA3 Existing System. Initial TA4 privacy measurement toolset is used to assess TA3 systems.
- **Phase 3:** Final versions of TA1 and TA2 technology are demonstrated on a TA3 Research System and on a TA3 Existing System. A full TA4 privacy measurement toolset used to assess TA3 systems.

By Month 15 of each Phase, performers in TA3 will deliver versions of the research system and existing system that incorporate the contributions of the TA1 and TA2 performers in their collaborative research team. Performers in TA4 will analyze the results of these demonstration systems using their metrics and produce privacy assessments in time for the final PI meeting of each phase. These TA4 assessments are *research results*. They contribute to shared understanding of progress within and across teams. They do not constitute a formal review process by the Government.

Deliverables

All performers shall be required to provide the following deliverables, as appropriate:

- Source code, other necessary data, and accompanying documentation for all software developed under this program.
- Slide Presentations - Annotated slide presentations shall be submitted within one month after the program kickoff meeting and after each program event (program reviews, PI meetings, and technical interchange meetings).
- Monthly Progress Reports - A monthly progress report describing technical progress made, resources expended, major risks, planned activities, trip summaries, changes to key personnel, and any potential issues and problem areas requiring the attention of the Government team shall be provided within 10 days after the end of each month.
- A Technical and Management Work Plan with a project schedule including milestones, updated as required.
- Final Report after each program phase. The final report shall concisely summarize the effort conducted

Government-furnished Property/Equipment/Information

- None

Intellectual Property

The program will emphasize creating and leveraging open source technology and architecture. Proposers are encouraged to use and produce open-source tools and systems wherever possible. Proposers who wish to assert IP rights that are not aligned with open source regimes should make a case explaining why the asserted IP rights will aid in effective transition and use of the technologies.

II. AWARD INFORMATION

A. Awards

Multiple awards are anticipated. The level of funding for individual awards made under this solicitation has not been predetermined and will depend on the quality of the proposals received and the availability of funds. Awards will be made to proposers whose proposals are determined to be the most advantageous and provide the best value to the Government, all factors considered, including the potential contributions of the proposed work, overall funding strategy, and availability of funding. See Section V for further information.

The Government reserves the right to:

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

Proposals selected for award negotiation may result in a procurement contract, grant, cooperative agreement, or other transaction (OT) depending upon the nature of the work proposed, the required degree of interaction between parties, 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 or cooperative agreements, the Government contracting officer may select other award instruments, as appropriate. Publication or other restrictions will be applied, as necessary, if DARPA 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 below.

B. Fundamental Research

It is Department of Defense (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. NSDD 189 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 BAA, 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 BAA. 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 BAA criteria for submissions. If proposals are selected for award that offer other than a fundamental research solution, the Government will either work with the proposer to modify the proposed statement of work to bring the research back into line with fundamental research or else the proposer will agree to restrictions in order to receive an award.

Proposers should indicate in their proposal whether they believe the scope of the proposed research is fundamental. For certain research projects, it may be possible that although the research to be performed by the prime proposer is non-fundamental, a subcontractor's tasks may be considered fundamental research. In those cases, it is the prime proposer's responsibility to explain in their proposal why its subcontractor's effort is fundamental research. While proposers should clearly explain the intended results of their research, DARPA shall have sole discretion to determine whether the project is considered fundamental research. Awards for non-fundamental research will include the following statement or similar provision:

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: title, author, short plain-language description of technology discussed in the material (approx. 30 words), number of pages (or minutes of video) and type (e.g., briefing, report, abstract, article, or paper); 2) Event

Information: type (e.g., conference, principal investigator meeting, article or paper), 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 address and phone number. 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 to prc@darpa.mil or 675 North Randolph Street, Arlington VA 22203-2114, telephone (571) 218-4235.

See [http://www.darpa.mil/NewsEvents/Public Release Center/Public Release Center.aspx](http://www.darpa.mil/NewsEvents/Public%20Release%20Center/Public%20Release%20Center.aspx) for further information about DARPA's public release process.

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

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

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

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 solicitation in any capacity unless the following conditions are met.

- FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector and must provide a letter on official letterhead from their sponsoring organization citing the specific authority establishing the FFRDC's eligibility to propose to Government solicitations and compete with industry, and compliance with the terms and conditions in the associated FFRDC sponsor agreement. This information is required for FFRDCs proposing as either prime contractors or subcontractors.
- Government entities must clearly demonstrate that the proposed work is not otherwise available from the private sector and provide documentation citing the specific statutory authority (and contractual authority, if relevant) establishing their eligibility to propose to Government solicitations.

At the present time, DARPA does not consider 15 USC § 3710a to be sufficient legal authority to show eligibility. For some entities, 10 USC § 2539b may be the appropriate statutory starting point; however, specific supporting regulatory guidance, together with evidence of agency approval, will still be required to fully establish eligibility.

DARPA will consider eligibility submissions on a case-by-case basis; however, the burden to prove eligibility for all team members rests solely with the proposer.

2. Foreign Participation

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

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

Current Federal employees are prohibited from participating in particular matters involving conflicting financial, employment, and representational interests (18 USC §§ 203, 205, and 208). Prior to the start of proposal evaluation, the Government will assess potential COIs 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.

In accordance with FAR 9.5 and without prior approval or a waiver from the DARPA Director, a contractor cannot simultaneously provide scientific, engineering, and technical assistance (SETA) or similar support and be a technical performer. As part of the proposal submission, all members of a proposed team (prime proposers, proposed subcontractors and consultants) must affirm whether they (individuals and organizations) are providing SETA or similar support to any DARPA technical office(s) through an active contract or subcontract. Affirmations must state which office(s) the proposer and/or proposed subcontractor/consultant supports and must provide prime contract number(s). All facts relevant to the existence or potential existence of OCIs must be disclosed. The disclosure shall 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 a question as to what constitutes a conflict, a summary of the potential conflict should be sent to brandeis@darpa.mil before preparing a proposal and mitigation plan.

C. Cost Sharing/Matching

Cost sharing is not required; however, it will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument (e.g., OTs under the authority of 10 USC § 2371).

D. Other Eligibility Requirements

1. Ability to Receive Awards in Multiple Technical Areas

DARPA anticipates making multiple awards for all technical areas. Each proposal submitted must target one and only one TA. Proposers interested in multiple TAs should submit multiple proposals, one for each TA. Performers in all TAs must demonstrate their willingness and capability to adapt and integrate their efforts and plans into tightly-coupled, multi-performer, collaborative research teams.

2. Ability to Support Classified Development

No classified development is anticipated. Brandeis is a fundamental research program.

IV. APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Package

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

B. Content and Form of Application Submission

Proposals

Proposals consist of Volume 1: Technical and Management Proposal (including Appendix A) and Volume 2: Cost Proposal.

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

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

a. Volume 1: Technical and Management Proposal

The maximum page count for Volume 1 is 25 pages, including all figures, tables and charts but not including the cover sheet, table of contents or appendices. *Brevity and clarity in Volume 1 will be valued highly.* A submission letter is optional and is not included in the page count. Appendix A does not count against the page limit and is mandatory.

Volume 1 must include the following components:

i. Cover Sheet: Include the following information.

- Label: "Proposal: Volume 1"
- BAA number (DARPA-BAA-15-29)
- Technical Area
- Proposal title
- Lead organization (prime contractor) name
- Type of organization, selected from the following categories: Large Business, Small Disadvantaged Business, Other Small Business, HBCU, MI, Other Educational, or Other Nonprofit
- Technical point of contact (POC) including name, mailing address, telephone, and email
- Administrative POC including name, mailing address, telephone number, and email address

- Award instrument requested: procurement contract (specify type), grant, cooperative agreement or OT.³
- Place(s) and period(s) of performance
- Other team member (subcontractors and consultants) information (for each, include Technical POC name, organization, type of organization, mailing address, telephone number, and email address)
- Proposal validity period (minimum 120 days)
- Data Universal Numbering System (DUNS) number⁴
- Taxpayer identification number⁵
- Commercial and Government Entity (CAGE) code⁶
- Proposer’s reference number (if any)

ii. Table of Contents

iii. Executive Summary: Provide a synopsis of the proposed project (approximately one page). Taking the context of the BAA and target technical area as already understood, the executive summary should address the following questions:

- Within the target TA, what is the proposed work attempting to accomplish?
- What are the limitations with how it is done today?
- What key challenges need to be overcome?
- What technological approaches are being proposed to achieve the goal?
- What will be the consequences if the work is successful?
- How much will it cost, and how long will it take?

iv. Goals and Impact: Describe clearly what the proposed effort is trying to achieve. Describe the difference this proposed effort will make if successful (qualitatively and/or quantitatively), and the principal deliverables associated with the proposed project. Make clear the innovative aspects of the project in the context of existing capabilities and approaches, delineating the uniqueness and benefits of this project in the context of the state of the art and alternative approaches.

v. Collaborative Research Team Concept: Describe how the proposed effort would fit into a collaborative research team. Describe any critical capabilities that other TAs within a collaborative research team would need to provide for this effort to be successful, as well as any additional capabilities that could be accommodated. Describe

³ Information on award instruments can be found at

http://www.darpa.mil/Opportunities/Contract_Management/Contract_Management.aspx.

⁴ The DUNS number is used as the Government’s contractor identification code for all procurement-related activities. Go to <http://fedgov.dnb.com/webform/index.jsp> to request a DUNS number (may take at least one business day). See Section VI.B.8. for further information.

⁵ See <http://www.irs.gov/businesses/small/international/article/0,,id=96696,00.html> for information on requesting a TIN. Note, requests may take from 1 business day to 1 month depending on the method (online, fax, mail).

⁶ A CAGE Code identifies companies doing or wishing to do business with the Federal Government. See Section VI.B.8 for further information.

such compatible approaches primarily in technological terms, providing such information that would most helpful in the determining how to construct high-functioning collaborative research teams.

vi. Technical Plan: Specific to the TA for this proposal, outline and address technical challenges inherent in the approach and possible solutions for overcoming potential problems. Demonstrate a deep understanding of the technical challenges and present a credible (even if risky) plan to achieve the project’s goal. Describe any milestones (quantitative if possible) at intermediate stages of the effort that may be used to demonstrate progress, and explain the research plan for achieving the milestones. Discuss mitigation of technical risk, especially what alternative directions will be tried if the primary directions appear not to be bearing fruit.

vii. Personnel and Management Plan: Provide a summary of expertise of the proposed team for this TA, including any subcontractors/consultants and other personnel who will be executing the work. Identify a principal investigator (PI) for the project. List key personnel with a one paragraph summary of their qualifications and previous work in this or closely related research areas. DARPA expects all key personnel associated with a proposal to make substantial time commitment to the proposed activity and the proposal will be evaluated accordingly. It is DARPA’s intention to put key personnel conditions into the awards, so proposers should not propose personnel that are not anticipated to execute the award. Indicate the level of effort in terms of hours to be expended by each person during each contract year. Include a table of key individual time commitments as follows:

Key Individual	2015	2016	2017	2018	2019
Name 1	xx hours	xx hours	xx hours	xx hours	xx hours
Name 2	xx hours	xx hours	xx hours	xx hours	xx hours

Provide a clear description of the team’s organization including unique capabilities and task responsibilities of team members. Describe any formal teaming agreements that are required to execute this project. Describe how the team will interact with performers in other TAs and provide a notional management plan for coordination of research within a larger collaborative research team.

viii. Capabilities: Describe organizational experience in relevant subject area(s), existing intellectual property, or specialized facilities. Discuss any work in closely related research areas and previous accomplishments.

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

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

task/subtask.

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

x. Schedule and Milestones: Provide a schedule showing tasks (task name, duration, performing organization), milestones, and any major interrelationships among tasks. The task structure must be consistent with that in the SOW. Milestones should be clearly articulated and defined in time relative to the start of the project.

xi. Cost Summary: Provide the cost summary as described in Section IV.B.2.b.ii.

xii. Appendix A: This section is mandatory and must include all of the following components. If a particular subsection is not applicable, state “NONE.”

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

Individual Name	Role (Prime, Subcontractor or Consultant)	Organization	Non-US?		FFRDC or Govt?
			Org.	Ind.	

- (2). Government or FFRDC Team Member Proof of Eligibility to Propose:** If none of the team member organizations (prime or subcontractor) are a Government entity or FFRDC, state “NONE.”

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

- (3). Government or FFRDC Team Member Statement of Unique Capability:** If none of the team member organizations (prime or subcontractor) are a Government entity or FFRDC, state “NONE.”

If any of the team member organizations are a Government entity or FFRDC, provide a statement (per Section III.A.1) that demonstrates the work to be

performed by the Government entity or FFRDC team member is not otherwise available from the private sector.

- (4). Organizational Conflict of Interest Affirmations and Disclosure:** If none of the proposed team members is currently providing SETA or similar support as described in Section III.B, state “NONE.”

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

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

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

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

NONCOMMERCIAL				
Technical Data and/or Computer Software To be 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)

COMMERCIAL				
Technical Data and/or 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)

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

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

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

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

- (8). Representations Regarding Unpaid Delinquent Tax Liability or a Felony Conviction under Any Federal Law:** Per Section VI.B.10, complete the following statements.

(a) The proposer represents that it is is not a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

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

- (9). Cost Accounting Standards (CAS) Notices and Certification:** Per Section VI.B.11, any proposer who submits a proposal which, if accepted, will result in a CAS-compliant contract, must include a Disclosure Statement as required by 48 CFR 9903.202. The disclosure forms may be found at http://www.whitehouse.gov/omb/procurement_casb.

If this section is not applicable, state “NONE.”

b. Volume 2 - Cost Proposal

This volume is mandatory and must include all the listed components. No page limit is specified for this volume.

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

Pre-award costs will not be reimbursed unless a pre-award cost agreement is negotiated prior to award.

i. Cover Sheet: Include the same information as the cover sheet for Volume 1, but with the label "Proposal: Volume 2."

ii. Cost Summary: Provide a single-page summary broken down by Government fiscal year listing cost totals for labor, materials, other direct charges (ODCs), indirect costs (overhead, fringe, general and administrative (G&A)), and any proposed fee for the project. Include costs for each task in each year of the project by prime and major subcontractors, total cost and proposed cost share, if applicable.

iii. Cost Details: For each task, provide the following cost details. Include supporting documentation describing the method used to estimate costs. Identify any cost sharing.

(1) Direct Labor: Provide labor categories, rates and hours. Justify rates by providing examples of equivalent rates for equivalent talent, past commercial or Government rates or Defense Contract Audit Agency (DCAA) approved rates.

(2) Indirect Costs: Identify all indirect cost rates (such as fringe benefits, labor overhead, material overhead, G&A, etc.) and the basis for each.

(3) Materials: Provide an itemized list of all proposed materials, equipment, and supplies for each year including quantities, unit prices, proposed vendors (if known), and the basis of estimate (e.g., quotes, prior purchases, catalog price lists, etc.). For proposed equipment/information technology (as defined in FAR 2.101) purchases equal to or greater than \$50,000, include a letter justifying the purchase. Include any requests for Government-furnished equipment or information with cost estimates (if applicable) and delivery dates.

(4) Travel: Provide a breakout of travel costs including the purpose and number of trips, origin and destination(s), duration, and travelers per trip.

(5) Subcontractor/Consultant Costs: Provide above info for each proposed subcontractor/consultant. Subcontractor cost proposals must include interdivisional work transfer agreements or similar arrangements.

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

Proprietary subcontractor/consultant cost proposals may be included as part of Volume 2 or emailed separately to brandeis@darpa.mil. Email messages

must include "Subcontractor Cost Proposal" in the subject line and identify the principal investigator, prime proposer organization and proposal title in the body of the message.

(6) ODCs: Provide an itemized breakout and explanation of all other anticipated direct costs.

iv. Proposals Requesting a Procurement Contract: Provide the following information where applicable.

(1) Proposals for \$700,000 or more: Provide "certified cost or pricing data" (as defined in FAR 2.101) or a request for exception in accordance with FAR 15.403.

(2) Proposals for \$650,000 or more: Pursuant to Section 8(d) of the Small Business Act (15 USC § 637(d)), it is Government policy to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to organizations performing work as prime contractors or subcontractors under Government contracts, and to ensure that prime contractors and subcontractors carry out this policy. In accordance with FAR 19.702(a)(1) and 19.702(b), prepare a subcontractor plan, if applicable. The plan format is outlined in FAR 19.704.

(3) Proposers without a DCAA-approved cost accounting system: If requesting a cost-type contract, provide the DCAA Pre-award Accounting System Adequacy Checklist to facilitate DCAA's completion of an SF 1408. The checklist may be found at http://www.dcaa.mil/preaward_accounting_system_adequacy_checklist.html

v. Proposals Requesting an Other Transaction for Prototypes (845 OT) agreement: Proposers must indicate whether they qualify as a nontraditional Defense contractor⁷, have teamed with a nontraditional Defense contractor, or are providing a one-third cost share for this effort. Provide information to support the claims.

Provide a detailed list of milestones including: description, completion criteria, due date, and payment/funding schedule (to include, if cost share is proposed, contractor and Government share amounts). Milestones must relate directly to accomplishment of technical metrics as defined in the solicitation and/or the proposal. While agreement type (fixed price or expenditure based) will be subject to negotiation, the use of fixed price milestones with a payment/funding schedule is preferred. Proprietary information must not be included as part of the milestones.

⁷ For definitions and information on 845 OT agreements see http://www.darpa.mil/Opportunities/Contract_Management/Other_Transactions_and_Technology_Investment_Agreements.aspx and "Other Transactions (OT) Guide For Prototype Projects," dated January 2001 (as amended) at <http://www.acq.osd.mil/dpap/Docs/otguide.doc>.

1. Proprietary and Classified Information

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

a. Proprietary Information

Proposers are responsible for clearly identifying proprietary information. Submissions containing proprietary information must have the cover page and each page containing such information clearly marked.

b. Classified Information

Classified submissions (classified technical proposals or classified appendices to unclassified proposals) WILL NOT be accepted under this solicitation. Brandeis is a fundamental research program. If a determination is made that the award instrument may result in access to classified information, a DD Form 254, "DoD Contract Security Classification Specification," will be issued by DARPA and attached as part of the award. A DD Form 254 will not be provided to proposers at the time of submission. For reference, the DD Form 254 template is available at <http://www.dtic.mil/dtic/pdf/formsNguides/dd0254.pdf>.

C. Submission Dates and Times

Proposers are warned that submission deadlines as outlined herein are strictly enforced. Note: some proposal requirements may take from 1 business day to 1 month to complete. See the proposal checklist in Section VIII.D for further information.

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

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

Proposals

The proposal package—full proposal (Volume 1 and 2) and, as applicable, proprietary subcontractor cost proposals—must be submitted per the instructions outlined herein and received by DARPA no later than April 29, 2015, at 1200 noon (ET). Submissions received after this time will not be reviewed.

D. Funding Restrictions

Not applicable.

E. Other Submission Requirements

1. Unclassified Submission Instructions

Proposers must submit all parts of their submission package using the same method; submissions cannot be sent in part by one method and in part by another method nor should duplicate submissions be sent by multiple methods. **Email submissions of full proposals will not be accepted.** Please note that the only allowed email submissions are the proprietary subcontractor/consultant cost proposals, as mentioned above.

a. Proposals Requesting a Procurement Contract or Other Transaction

DARPA/I2O will employ an electronic upload submission system (<https://baa.darpa.mil/>) for UNCLASSIFIED proposals requesting award of a procurement contract or other transaction under this solicitation.

First time users of the DARPA BAA Submission Website must complete a two-step account creation process at <https://baa.darpa.mil/>. The first step consists of registering for an Extranet account by going to the above URL and selecting the "Account Request" link. Upon completion of the online form, proposers will receive two separate emails; one will contain a user name and the second will provide a temporary password. Once both emails have been received, proposers must go back to the submission website and log in using that user name and password. After accessing the Extranet, proposers must create a user account for the DARPA BAA Submission Website by selecting the "Register Your Organization" link at the top of the page. The DARPA BAA Submission Website will display a list of solicitations open for submissions. Once a proposer's user account is created, they may view instructions on uploading their proposal.

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

All submissions submitted electronically through DARPA's BAA website must be uploaded as zip files (.zip or .zipx extension). The final zip file should contain only the files requested herein and must not exceed 50 MB in size. Only one zip file will be accepted per submission. Note: Submissions not uploaded as zip files will be rejected by DARPA.

Please note that all submissions MUST be finalized, meaning that no further editing will be possible, when submitting through the DARPA BAA Submission Website in order for DARPA to be able to review your submission. If a submission is not finalized, the submission will not be deemed acceptable and will not be reviewed.

Website technical support may be reached at Action@darpa.mil and is typically available during regular business hours (9:00 AM – 5:00 PM ET, Monday-Friday). Questions regarding submission contents, format, deadlines, etc. should be emailed to brandeis@darpa.mil.

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

b. Proposals Requesting a Grant or Cooperative Agreement

Proposers requesting grants or cooperative agreements may submit proposals through one of the following methods: (1) mailed directly to DARPA; or (2) electronic upload per the instructions at <http://www.grants.gov/applicants/apply-for-grants.html>. Grant or cooperative agreement proposals may not be submitted through any other means.

Proposers choosing to mail hard copy proposals to DARPA must include one paper copy and one electronic copy (e.g., CD/DVD) of the full proposal package.

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 if all steps are not completed in a timely manner. See the Grants.gov user guides and checklists at <http://www.grants.gov/web/grants/applicants/applicant-resources.html> for further information.

Once Grants.gov has received an uploaded proposal submission, Grants.gov will send two email messages to notify proposers that: (1) their submission has been received by Grants.gov; and (2) the submission has been either validated or rejected by the system. It may take up to two business days to receive these emails. If the proposal is rejected by Grants.gov, it must be corrected and re-submitted before DARPA can retrieve it (assuming the solicitation has not expired). If the proposal is validated, then the proposer has successfully submitted their proposal and Grants.gov will notify DARPA. Once the proposal is retrieved by DARPA, Grants.gov will send a third email to notify the proposer. The proposer will then receive an email from DARPA acknowledging receipt and providing a control number.

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

Technical support for the Grants.gov website may be reached at 1-800-518-4726 and support@grants.gov. Questions regarding submission contents, format, deadlines, etc. should be emailed to brandeis@darpa.mil.

2. Classified Submission Instructions

Classified submissions (classified technical proposals or classified appendices to unclassified proposals) WILL NOT be accepted under this solicitation. BRANDEIS is a fundamental research program.

V. APPLICATION REVIEW INFORMATION

A. Evaluation Criteria

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

- *Overall Scientific and Technical Merit:* The proposed technical approach is feasible, achievable, complete and supported by a proposed technical team that has the expertise and experience to accomplish the proposed tasks. The task descriptions and associated technical elements are complete and in a logical sequence, with all proposed deliverables clearly defined such that a viable attempt to achieve project goals is likely as a result of award. The proposal identifies major technical risks and clearly defines feasible mitigation efforts.
- *Potential Contribution and Relevance to the DARPA Mission:* The potential contributions of the proposed project 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.
- *Cost Realism:* The proposed costs are based on realistic assumptions, reflect a sufficient understanding of the technical goals and objectives of the solicitation, and are consistent with the proposer’s technical/management approach (to include the proposed SOW). The costs for the prime and subcontractors/consultants are substantiated by the details provided in the proposal (e.g., the type and number of labor hours proposed per task, the types and quantities of materials, equipment and fabrication costs, travel and any other applicable costs).

B. Review and Selection Process

DARPA policy is to ensure impartial, equitable, and comprehensive proposal evaluations and to select proposals that meet DARPA technical, policy, and programmatic goals.

Qualified Government personnel will conduct a scientific and technical review of each conforming proposal and (if necessary) convene panels of experts in the appropriate areas. 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 appropriate nondisclosure agreements/requirements.

The review process identifies proposals that meet the established criteria and are, therefore, selectable for negotiation of funding awards by the Government. Selections under this solicitation will be made to proposers on the basis of the evaluation criteria listed above. Proposals that are determined to be selectable will not necessarily receive awards. Selections

may be made at any time during the period of solicitation.

Proposals are evaluated individually, not rated competitively against other proposals because they are not submitted in accordance with a common work statement. For purposes of evaluation, a proposal is defined to be the document and supporting materials as described in Section IV.

Failure to comply with the submission procedures may result in the submission not being evaluated. No submissions will be returned. After proposals have been evaluated and selections made, the original of each proposal will be retained at DARPA.

VI. AWARD ADMINISTRATION INFORMATION

A. Selection Notices

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

B. Administrative and National Policy Requirements

1. Intellectual Property

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

If proposers desire to use proprietary software or technical data or both as the basis of their proposed approach, in whole or in part, they should: 1) clearly identify such software/data and its proposed particular use(s); 2) explain how the Government will be able to reach its program goals (including transition) within the proprietary model offered; and 3) provide possible nonproprietary alternatives in any area that might present transition difficulties or increased risk or cost to the Government under the proposed proprietary solution.

Proposers expecting to use, but not to deliver, commercial open source tools or other materials in implementing their approach may be required to indemnify the Government against legal liability arising from such use.

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

a. Intellectual Property Representations

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

b. Patents

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

c. Procurement Contracts

- **Noncommercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all noncommercial technical data and computer software that it plans to generate, develop, and/or deliver, in which the Government will acquire less than unlimited rights and to assert specific restrictions on those deliverables. In the event a proposer does not submit the list, the Government will assume that it has unlimited rights to all noncommercial technical data and computer software generated, developed, and/or delivered, unless it is substantiated that development of the noncommercial technical data and computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data and computer software generated, developed, and/or delivered, proposers should identify the data and software in question as subject to 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 5 years, at which time the Government will acquire unlimited rights unless the parties agree otherwise. 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. Failure to provide full information may result in a determination that the proposal is not compliant with the solicitation. A template for complying with this request is provided in Section IV.B.a.xii.(5).
- **Commercial Items (Technical Data and Computer Software):** Proposers requesting a procurement contract must list all commercial technical data and commercial computer software that may be included in any noncommercial deliverables contemplated under the research project, and assert any applicable restrictions on the Government’s use of such commercial technical data and/or computer software. In the event a proposer does not submit the list, the Government will assume 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 to evaluate the proposer’s assertions. Failure to provide full information may result

in a determination that the proposal is not compliant with the solicitation. A template for complying with this request is provided in Section IV.B.a.xii.(5).

d. Other Types of Awards

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

2. Human Subjects Research (HSR)

All research selected for funding involving human subjects, to include the use of human biological specimens and human data, must comply with Federal regulations for human subject 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."⁸

Institutions awarded funding for research involving human subjects must provide documentation of a current Assurance of Compliance with Federal regulations for human subject protection, such as a Department of Health and Human Services, Office of Human Research Protection Federal Wide Assurance.⁹ All institutions engaged in human subject research, to include subcontractors, must have a valid Assurance. In addition, all personnel involved in human subject research must provide documentation of completion of HSR training.

For all research that will involve human subjects in the first year or phase of the project, the institution must submit evidence of or a plan for review by an institutional review board (IRB) as part of the proposal. The IRB conducting the review must be the IRB identified on the institution's Assurance of Compliance. 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. The designated IRB should be consulted for guidance on writing the protocol. The informed consent document must comply with 32 CFR 219.116. A valid Assurance of Compliance with human subjects protection regulations and evidence of appropriate training by all investigators and personnel should accompany the protocol for review by the IRB.

⁸ <http://www.dtic.mil/whs/directives/corres/pdf/321602p.pdf>

⁹ <http://www.hhs.gov/ohrp>

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. Confirmation of a current Assurance of Compliance and appropriate human subjects protection training is required before headquarters-level approval can be issued.

The time required to complete the IRB review/approval process will vary depending on the complexity of the research and the level of risk to study participants. The IRB approval process can last 1 to 3 months, followed by a DoD review that could last 3 to 6 months. Ample time should be allotted to complete the approval process. DoD/DARPA funding cannot be used toward HSR 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:

- 9 CFR Parts 1-4, Department of Agriculture regulation that implements the Animal Welfare Act of 1966, as amended (7 USC §§ 2131-2159);
- National Institutes of Health Publication No. 86-23, "Guide for the Care and Use of Laboratory Animals" (8th Edition); and
- 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 Policy on Humane Care and Use of Laboratory Animals."¹⁰

All award recipients must receive approval by a DoD-certified veterinarian, in addition to IACUC approval. No animal studies may be conducted using DoD/DARPA funding until the U.S. 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 recipient will be required to complete and submit an ACURO Animal Use Appendix.¹¹

4. Export Control

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

¹⁰ <http://grants.nih.gov/grants/olaw/olaw.htm>

¹¹ https://mrmc.amedd.army.mil/index.cfm?pageid=Research_Protections.acuroAnimalAppendix

5. 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 USC § 794d) and FAR 39.2. Each project involving the creation or inclusion of electronic and information technology must ensure that: (1) Federal employees with disabilities will have access to and use of information that is comparable to the access and use by Federal employees who are not individuals with disabilities; and (2) members of the public with disabilities seeking information or services from DARPA will have access to and use of information and data that is comparable to the access and use of information and data by members of the public who are not individuals with disabilities.

6. Employment Eligibility Verification

Per FAR 22.1802, recipients of FAR-based procurement contracts must enroll as Federal contractors in E-verify¹² and use the system to verify employment eligibility of all employees assigned to the award. All resultant contracts from this solicitation will include the clause at FAR 52.222-54, "Employment Eligibility Verification." This clause will not be included in grants, cooperative agreements, or OTs.

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

Unless the proposer is exempt from this requirement, as per FAR 4.1102 or 2 CFR 25.110, as applicable, all proposers must be registered in the SAM and have a valid DUNS number prior to submitting a proposal. All proposers must provide their DUNS number in each proposal they submit. All proposers must maintain an active SAM registration with current information at all times during which they have an active Federal award or proposal under consideration by DARPA. Information on SAM registration is available at <http://www.sam.gov>.

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

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

8. Reporting Executive Compensation and First-Tier Subcontract Awards

Per FAR 4.1403, FAR-based procurement contracts valued at \$25,000 or more will include the clause at FAR 52.204-10, "Reporting Executive Compensation and First-Tier Subcontract Awards." A similar award term will be used in grants and cooperative agreements.

¹²<http://www.uscis.gov/e-verify>

9. Updates of Information Regarding Responsibility Matters

Per FAR 9.104-7(c), all contracts valued at \$500,000 or more, where the contractor has current active Federal contracts and grants with total value greater than \$10,000,000, will include FAR clause 52.209-9, "Updates of Publicly Available Information Regarding Responsibility Matters."

10. Representation by Corporations Regarding Unpaid Delinquent Tax Liability or a Felony Conviction under Any Federal Law – Fiscal Year 2014 Appropriations (Deviation 2014-O0004)

In accordance with sections 744 and 745 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 11-235), none of the funds made available by this or any other Act may be used to enter into a contract with any corporation that: (1) has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government; or (2) was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless the agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government. Each proposer must complete and return the representations outlined in Section IV.B.a.xii.(8) with their proposal submission.

11. Cost Accounting Standards (CAS) Notices and Certification

Per FAR 52.230-2, any procurement contract in excess of \$700,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR 99), except those contracts which are exempt as specified in 48 CFR 9903.201-1. Any proposer who submits a proposal which, if accepted, will result in a CAS-compliant contract, must include a Disclosure Statement as required by 48 CFR 9903.202. The disclosure forms may be found at http://www.whitehouse.gov/omb/procurement_casb.

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

CUI refers to unclassified information that does not meet the standard 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: (1) protection from unauthorized disclosure, (2) special handling safeguards, or (3) prescribed limits on exchange or dissemination. All non-DoD entities doing business with DARPA are expected to adhere to the following procedural safeguards, in addition to any other relevant Federal or DoD specific procedures, for submission of any proposals to DARPA and any potential business with DARPA:

- Do not process DARPA CUI on publicly available computers or post DARPA CUI to publicly available webpages or websites that have access limited only by domain or

Internet protocol restriction.

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

13. Safeguarding of Unclassified Controlled Technical Information

Per DFARS 204.7300, the DFARS clause at 252.204-7012 (Safeguarding of Unclassified Controlled Technical Information), applies to this solicitation and all resultant contracts.

C. Reporting

1. Technical and Financial Reports

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

2. Representations and Certifications

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

3. Wide Area Work Flow (WAWF)

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

4. i-Edison

Award documents will contain a requirement for patent reports and notifications to be submitted electronically through the i-Edison Federal patent reporting system at <http://s-edison.info.nih.gov/iEdison>.

VII. AGENCY CONTACTS

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

- **Technical POC:** John Launchbury, Ph.D., Program Manager, DARPA/I2O
- **Email:** brandeis@darpa.mil
- **Mailing address:**
DARPA/I2O
ATTN: DARPA-BAA-15-29
675 North Randolph Street
Arlington, VA 22203-2114
- **I2O Solicitation**
Website: http://www.darpa.mil/Opportunities/Solicitations/I2O_Solicitations.aspx

VIII. OTHER INFORMATION

A. Frequently Asked Questions (FAQs)

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

DARPA will attempt to answer questions in a timely manner; however, questions submitted within 7 days of closing may not be answered. If applicable, DARPA will post FAQs to http://www.darpa.mil/Opportunities/Solicitations/I2O_Solicitations.aspx.

B. Collaborative Efforts/Teaming

It is DARPA's desire to receive comprehensive, quality responses to this solicitation. To facilitate strong, collaborative teaming efforts and business relationships, a website <https://www.schafertmd.com/darpa/i2o/brandeis/teaming/> has been established. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the DoD endorses the destination web site or the information and organizations contained therein, nor does DARPA or the DoD exercise any responsibility at the destination. This website is provided consistent with the stated purpose of this solicitation.

C. Proposers Day

The Proposers' Day will be held on March 12, 2015, at the Holiday Inn, located in Arlington, Virginia. Check-in begins at 9:00 AM (ET). The meeting will begin at 10:00 AM (ET).

Please see the special notice, DARPA-SN-15-28, for more information regarding the Brandeis Proposers' Day. This special notice can be found at: <https://www.fbo.gov/index?s=opportunity&mode=form&id=3c42e0a2e2ae9774171cdf405f22ea3&tab=core&cvview=0>.

Attendance at the Proposers' Day is voluntary and is not required to propose to this solicitation. DARPA will not provide reimbursement for costs incurred in participating in this Proposers' Day.

D. Submission Checklist

The following items apply prior to proposal submission. Note: some items may take up to 1 month to complete.

✓	Item	BAA Section	Applicability	Comment
	Obtain DUNS number	IV.B.2.a.i	Required of all proposers	The DUNS Number is the Federal Government's contractor identification code for all procurement-related activities. See http://fedgov.dnb.com/webform/index.jsp to request a DUNS number. Note: requests may take at least one business day.
	Obtain Taxpayer Identification Number (TIN)	IV.B.2.a.i	Required of all proposers	A TIN is used by the Internal Revenue Service in the administration of tax laws. See http://www.irs.gov/businesses/small/international/article/0,,id=96696,00.html for information on requesting a TIN. Note: requests may take from 1 business day to 1 month depending on the method (online, fax, mail).
	Register in the System for Award Management (SAM)	VI.B.7	Required of all proposers	The SAM combines Federal procurement systems and the Catalog of Federal Domestic Assistance into one system. See www.sam.gov for information and registration. Note: new registrations can take an average of 7-10 business days. SAM registration requires the following information: <ul style="list-style-type: none"> -DUNS number -TIN -CAGE Code. A CAGE Code identifies companies doing or wishing to do business with the Federal Government. If a proposer does not already have a CAGE code, one will be assigned during SAM registration. -Electronic Funds Transfer information (e.g., proposer's bank account number, routing number, and bank phone or fax number).
	Register in E-Verify	VI.B.6	Required for proposers requesting procurement contracts	E-Verify is a web-based system that allows businesses to determine the eligibility of their employees to work in the United States. See http://www.uscis.gov/e-verify for information and registration.
	Ensure representations and certifications are up to date	VI.C.2	Required of all proposers	Federal provisions require entities to represent/certify to a variety of statements ranging from environmental rules compliance to entity size representation. See http://www.sam.gov for information.
	Ensure eligibility of all team members	III	Required of all proposers	Verify eligibility, as applicable, for in accordance with requirements outlined in Section 3.
	Register at Grants.gov	IV.E.1.b	Required for proposers requesting grants or cooperative agreements	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 if all steps are not completed in a timely manner. See the Grants.gov user guides and checklists at http://www.grants.gov/web/grants/applicants/applicant-resources.html for further information.

The following items apply as part of the submission package:

✓	Item	BAA Section	Applicability	Comment
	Volume 1 (Technical and Management Proposal)	IV.B.a	Required of all proposers	Conform to stated page limits and formatting requirements. Include all requested information.
	Appendix A	IV.B..a.xii	Required of all proposers	<ul style="list-style-type: none"> -Team member identification - Government/FFRDC team member proof of eligibility - Organizational conflict of interest affirmations - Intellectual property assertions - Human subjects research - Animal use - Unpaid delinquent tax liability/felony conviction representations -CASB disclosure, if applicable
	Volume 2 (Cost Proposal)	IV.B..b	Required of all proposers	<ul style="list-style-type: none"> - Cover Sheet - Cost summary - Detailed cost information including justifications for direct labor, indirect costs/rates, materials/equipment, subcontractors/consultants, travel, ODCs - Cost spreadsheet file (.xls or equivalent format) - If applicable, list of milestones for 845 OTs - Subcontractor plan, if applicable - Subcontractor cost proposals - Itemized list of material and equipment items to be purchased with vendor quotes or engineering estimates for material and equipment more than \$50,000 - Travel purpose, departure/arrival destinations, and sample airfare