



**Homeland
Security**

Informational Webinar

November 1, 2017

Agenda

- Challenge Overview
- About the Challenge
- Stage 1 & 2 Details
- Q&A



**Homeland
Security**

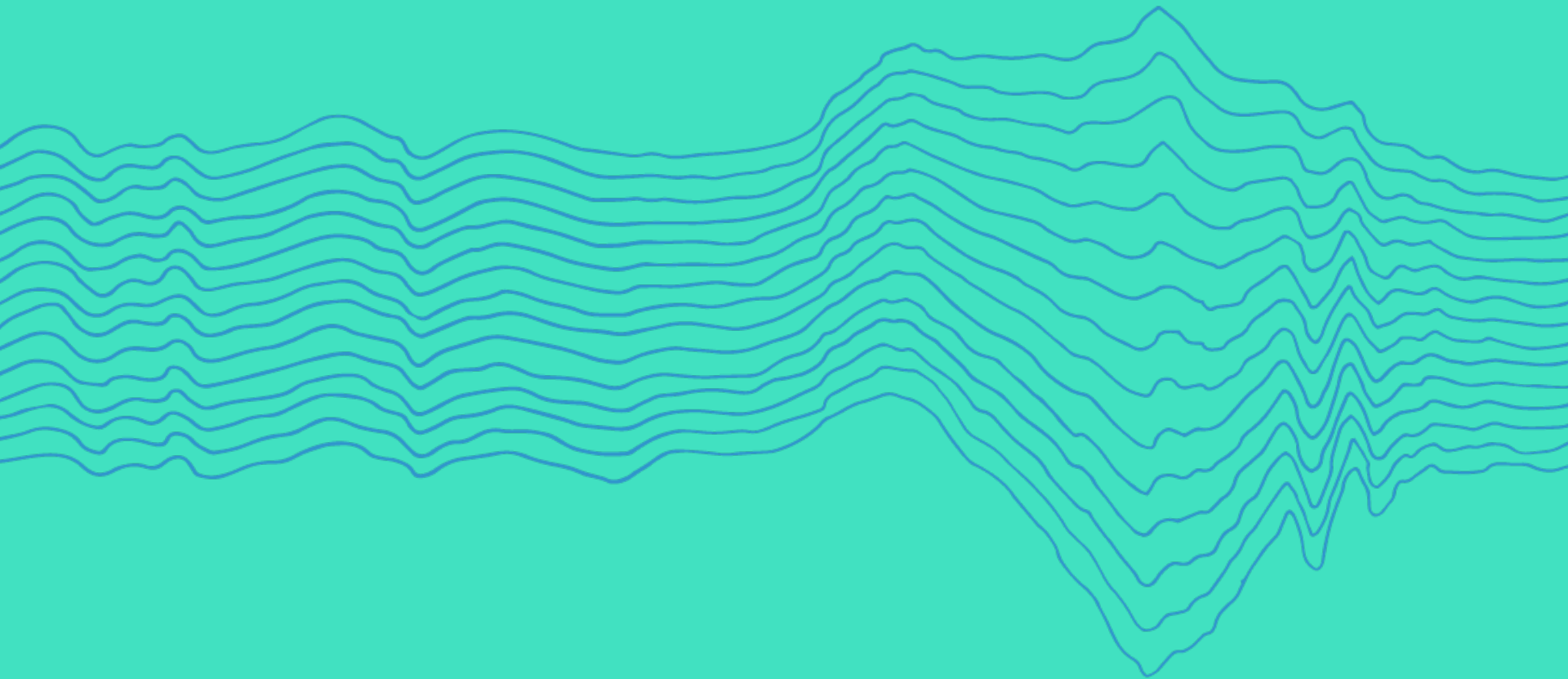
Science and Technology



Challenge supported by:
Luminary Labs



CHALLENGE OVERVIEW



Call to Action

Can you help identify biothreats in real time?

With the Hidden Signals Challenge, the U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T), in collaboration with the Office of Health Affairs National Biosurveillance Integration Center, calls upon data innovators from a wide variety of fields—from data science, to civic tech, to epidemiology—to develop concepts for novel uses of existing data that will identify signals and achieve timelier alerts for biothreats in our cities and communities.



Prize Purse

Cash Prize Purse

\$300,000

Stage 1: \$100,000

Up to five Finalists will each receive \$20,000* as seed money to develop their concepts into detailed system designs, with guidance from a panel of expert mentors.

Stage 2 (Optional): \$200,000

Selected winner(s) will receive up to \$200,000, and the winning system design(s) will then be developed into working algorithms and tools.

**As part of their acceptance of the associated Stage 1 cash prize, Finalists agree to participate in any potential Stage 2 activities. Please see the Rules, Terms & Conditions on the Challenge website for full details.*



Challenge Timeline

Stage 1 Submissions Open: October 17, 2017

Entrants submit concepts at www.hiddensignalschallenge.com.
Advance registration required.

Stage 1 Submission Deadline: December 4, 2017

The Challenge will stop accepting submissions at 4:59 PM ET on Monday, December 4, 2017.

Stage 1 Finalists Announced: Winter 2018

Up to five Finalists will be chosen by expert judges to receive \$20,000 each.

Stage 2 (Discretionary): Winter – Spring 2018 (Anticipated)

At DHS's discretion, a Stage 2 of the Challenge may follow Stage 1. During Stage 2, Finalists from Stage 1 will compete for an additional \$200,000 in cash prizes.*

**Please see the Rules, Terms & Conditions on the Challenge website for full details.*



Meet the Judges



Matthew Davenport, PHD

Program Manager, Chemical and Biological Defense Division, U.S. Department of Homeland Security Advanced Research Projects Agency



Ranu Dhillon, MD

Senior Health Advisor, Earth Institute, Columbia University; Global Health Equity, Brigham and Women's Hospital



Thomas McGinn, DVM

Senior Health Advisor, U.S. Department of Homeland Security National Biosurveillance Integration Center



Eric Moore, PHD

Director, Research & Technology, Edgewood Chemical Biological Center



Gary Schenkel

Former Executive Director, Chicago Office of Emergency Management and Communications



Ida Sim, MD, PHD, FACMI

Co-Director, Biomedical Informatics, UCSF Clinical and Translational Sciences Institute

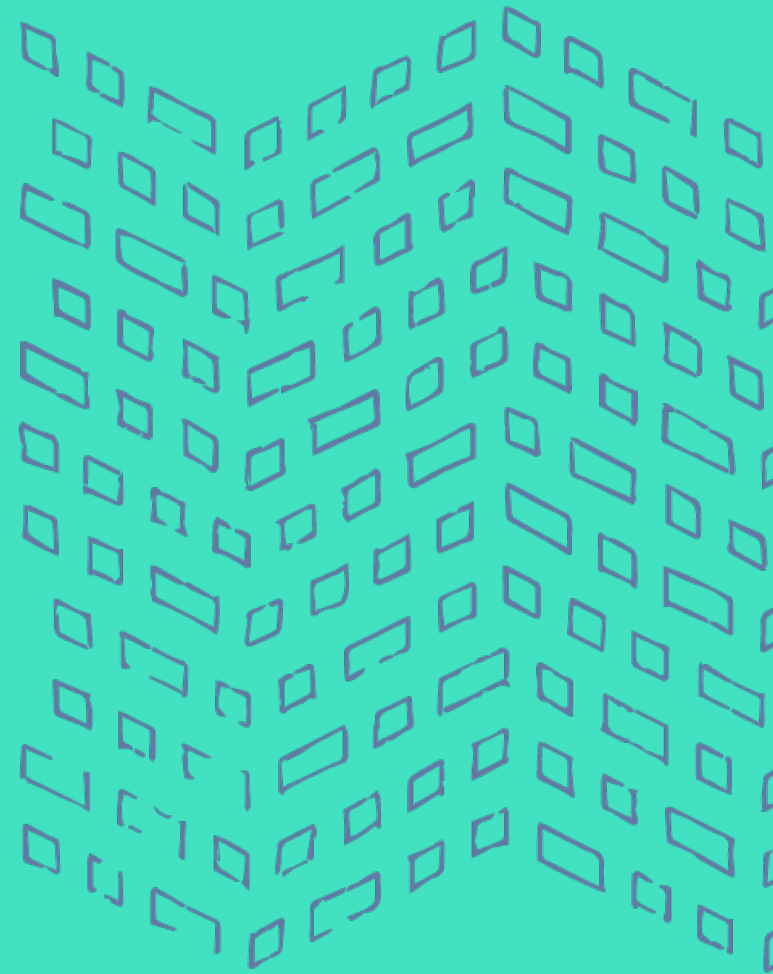


Sheila van Cuyk, PHD

Program Manager, Chemical and Biological Defense Division, U.S. Department of Homeland Security Advanced Research Projects Agency



ABOUT THE CHALLENGE



Why now?

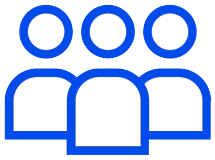
A number of biosurveillance tools and systems have been developed (from BioWatch to BioSense), but these systems largely rely on health data or environmental detection, which:

- is not generated early enough or processed fast enough for a real-time alert
- can be difficult to access and use freely
- represents only a fraction of all the data available

With the proliferation of new technologies and data sources, we now have an unprecedented opportunity to identify signals and correlations hiding in the vast array of existing data



What DHS hopes to accomplish



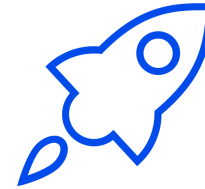
Engage a diverse community of solvers and gain access to new thinking

You don't have to be an expert in biothreats to have a valuable insight for anomaly detection. Data innovators from a wide variety of fields are encouraged to develop concepts.



Maximize available traditional and non-traditional data resources

From environmental data, to search data, animal health data, absentee data, surveillance data, GIS and movement data, there is a wealth of data to explore and correlate.



Accelerate concept development process to save lives faster

The Challenge aims to be a first step in the design of a local/national system, by developing a proof of concept that can ultimately expand to more geographies, and/or more anomalous conditions.



Concept Focus Areas

**Biothreats, not
Chemical Threats**

**Real-time
Alerts**

**Actionable
Insights**

**Detecting Conditions
vs. Pathogens**



Concept Focus Areas

Biothreats, not Chemical Threats

Biothreats and chemical threats are both important for our health and safety, but **biothreats are the main priority for this Challenge** because there is a greater opportunity to make an impact in the biothreat space.

Chemical threats have more easily detectable early warning signs, and there are many effective detection tools for chemical threats.

Biosurveillance tools still largely rely on health data, and this slower, highly regulated data source does not enable early detection.



Concept Focus Areas

Real-time Alerts

The emphasis on real-time alerts means:

- Fast-acting biothreats that produce symptoms zero-to ten-days from exposure are a good place to start.
- Data should be generated within < 36 hours, and regularly updated, in order to detect signals as close to real time as possible.

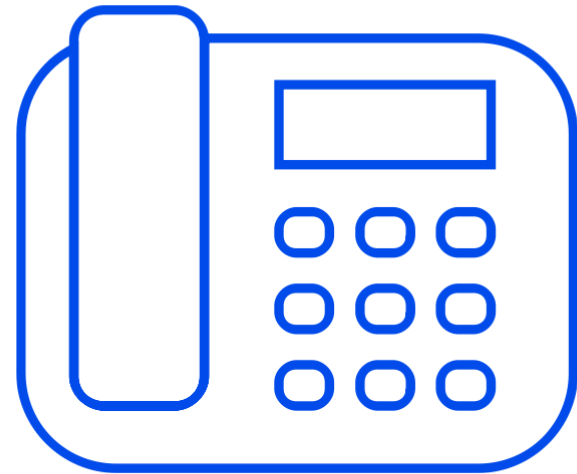


Concept Focus Areas

Actionable Insights

Data-driven insights on emerging biothreats must be clearly actionable, so that a city-level operator can pick up the phone and begin intervention with confidence.

A solution must consider how to provide insights in a way that acknowledges the appropriate level of confidence required for a warning to trigger intervention.

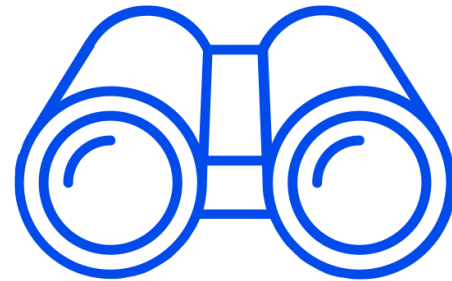


Concept Focus Areas

Detecting Conditions vs. Pathogens

The nature of biothreat signals makes it difficult to detect specific pathogens, especially in varying contexts (e.g., respiratory distress could mean many things during allergy season).

In order to build off of previous biosurveillance efforts, solvers are encouraged to explore detection of anomalous symptoms and conditions as well.



Sample Scenario

Subway delays

It's 6:30pm on Thursday in New York City, and a subway train is experiencing significant delays due to multiple holds for the removal of sick passengers. All sick passengers have been exhibiting some form of acute respiratory distress, and a few have fainted.

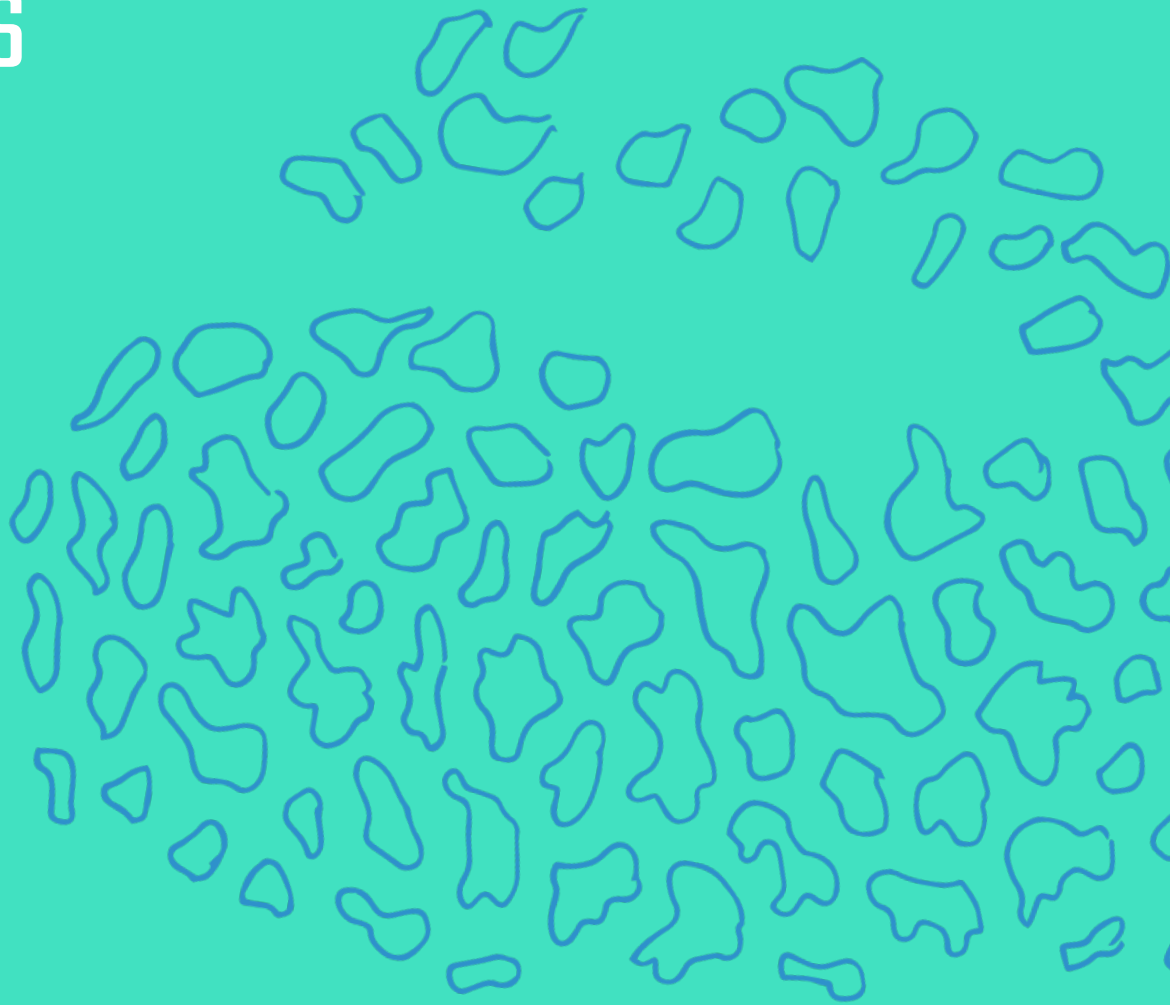
Thousands of commuters ride this train daily to and from work; upon reviewing video surveillance from stations along the train line, Metropolitan Transit Authority (MTA) operators have anecdotally noted a lot of people coughing and sneezing from Monday to Thursday.

Is this a coincidence? How can data help us investigate this event further? How might the city have noticed this sooner?

#HiddenSignals



STAGE 1 & 2 DETAILS



Stage 1—Criteria

- **Originality.** Presents a novel approach to the problem, and offers creative solutions and unique hypotheses.
- **Impact.** Has the potential to significantly advance current city-level practices and resources for identifying biothreat signals, and simultaneously complements existing resources.
- **Feasibility.** Demonstrates significant potential to rapidly detect patterns with a high degree of confidence, ideally within a day of exposure and no longer than ten days from exposure, and uses technically sound methods that are backed by credible supporting evidence.
- **Sustainability.** Makes use of freely available and/or low-cost data sources that are readily accessible to city-level operators and DHS on a consistent and long-term basis.
- **Scalability.** Has the ability or potential to expand to other geographic areas, or signals indicative of biothreat incidents or other scenarios of concern for homeland security.
- **Team.** Demonstrates an appropriate level of experience, commitment, and ability to move from concept to system design within the timeline of the Challenge



Stage 1—Eligibility

The Hidden Signals Challenge is open to:

- Individuals aged 18+ who serve as Team Leads and are U.S. citizens or permanent residents of the United States.

OR

- An entity incorporated in and maintaining a primary place of business in the United States.

NOTE: Foreign citizens can be listed as a Team Member by an eligible Team Lead or can enter as employees of an entity that is properly incorporated in the U.S. and maintains a primary place of business in the U.S. See site for [full list of Eligibility requirements](#).



Stage 1—Intellectual Property (IP)

As part of their acceptance of the Stage 1 cash prize, each Finalist hereby grants to DHS and its designees a worldwide, non-exclusive, sub-licensable, transferable, fully paid-up, royalty-free, perpetual, irrevocable right to use, reproduce, distribute, modify, create derivative works, publicly perform, publicly display, digitally perform, make, have made, distribute and import their Stage 1 submission and other data submitted, in any media now known or hereafter developed, for any purpose whatsoever, commercial or otherwise, without further approval by or payment to the Finalist, and represents that he/she/it has the unrestricted right to grant that license.

Furthermore, the Finalist hereby grants the government and its designees a worldwide, non-exclusive, sub-licensable, transferable, fully paid-up, royalty-free, perpetual, irrevocable, unlimited rights to the government or its designees to apply or utilize the submission, modified submission, or derivative work with other data not owned by the Finalist and that all resulting data output is available to the government for unlimited use.



Stage 1—Submission Instructions

To complete your submission at www.hiddensignalschallenge.com, you will need to do the following **by 4:59 pm ET on Monday, December 4, 2017:**

- Identify an eligible Team Lead
- Create a Luminary Lightbox™ account, and link other team members
- Complete the submission form
- Submit your entry

It is highly recommended that you **complete all of these steps well ahead of the deadline**, to allow time for any potential technical issues.



(Discretionary) Stage 2—Details

At the discretion of the U.S. Department of Homeland Security (DHS), Challenge Finalists from the first stage of the Challenge (Stage 1) may be invited to participate in a second phase (Stage 2).

Prize Purse

\$200k (Winner(s) receive up to \$200k)

Stage 2 Focus

During Stage 2, Finalists from Stage 1 will further develop concepts into detailed system designs, with guidance from a panel of expert mentors.

Timeline

- Stage 2 Call for Submissions: Winter 2018
- Stage 2 Submission Deadline: Spring 2018
- Winner Announcement: Spring 2018



Q&A

Please submit questions in the chat window within Adobe Connect.

If we don't get to your question today, please check the Challenge blog, where we will follow up with responses to many questions received.



THANK YOU

For help, please email
hello@hiddensignalschallenge.com

Sign up for the Challenge newsletter for updates
about the Challenge: <http://eepurl.com/c7r5YH>

