# 2018 Biometric Technology Rally

**November 2017**

**Maryland Test Facility (MdTF)**

Department of Homeland Security

Science and Technology Directorate

# Overview

- **2018 Biometric Technology Rally**
    - Purpose & Benefits
    - Functional Requirements
    - Rally Test Process Summary
    - Rally Timeline
    - How to Participate

# Purpose of the Biometric Technology Rally

- To challenge industry to meet specific DHS S&T use-cases

  *The use-case for the 2018 Biometric Technology Rally is to identify travelers in a high-throughput security environment with unmanned face/iris systems.*

- The rally aims to foster innovation and create partnerships across government and industry

- Participation in the rally will help inform DHS S&T procurement activities such as operational tests, pilots, and system acquisitions

- The rally is a scenario test using a sample of demographically diverse volunteers that will be conducted over a two-week period in March

- Participation in the Biometric Technology Rally has several advantages for Rally Participants and other interested parties.
  - Opportunity to collect and retain biometric data
  - User feedback
  - Receive a performance report
  - Showcase system performance to potential customers

# Minimum Requirements for Participation

- **Rally system** – the set of hardware and software that each Rally Participant will use to acquire biometric images from volunteers

- The rally system shall:
    1. Collect facial biometric imagery from volunteers to support identification operations
    2. Provide at least one facial biometric probe image per volunteer
    3. Direct all aspects of each volunteer interaction necessary to achieve requirements 1 and 2
    4. Collect, process, and submit all biometric data within the period of interaction with the volunteer
    5. Operate in an unmanned mode, i.e. no operator/instructor
    6. Operate within a time-constraint defined by DHS
    7. Operate within a physical footprint and infrastructure defined by DHS

# Optional Data

- Optional additional data may be provided to improve understanding of system performance

- The system may:
    1. Provide **up to three face biometric probe images** per volunteer
    2. Provide **up to three pairs of iris biometric probe images** per volunteer
    3. Provide **suspected identities** based on a provided gallery of faces
    4. Provide up to **10 seconds of video** per volunteer
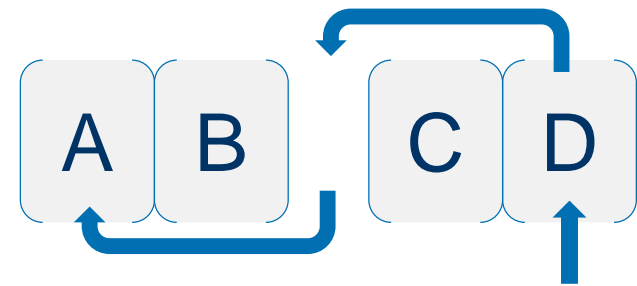        - Incorporating face imagery
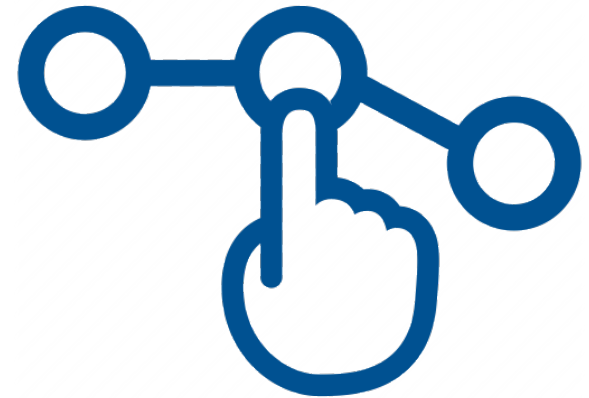
# Scenario Testing at MdTF

- The Biometric Technology Rally will be held at the MdTF
  - Located just outside the DC Metropolitan Beltway, near Fedex Field
  - Designed for testing large groups of volunteers in configurable scenarios
  - Provides software API for integrating biometric systems

- Rally scenario testing at MdTF
  - Up to 12 rally systems in parallel
  - Traveler identification test scenario
    - Groups of travelers processed using an automated, unmanned biometric system
  - Demographically diverse volunteers will be recruited by the MdTF team (n = 330)
    - May have some prior experience with biometrics
    - Will be instructed regarding the general test process
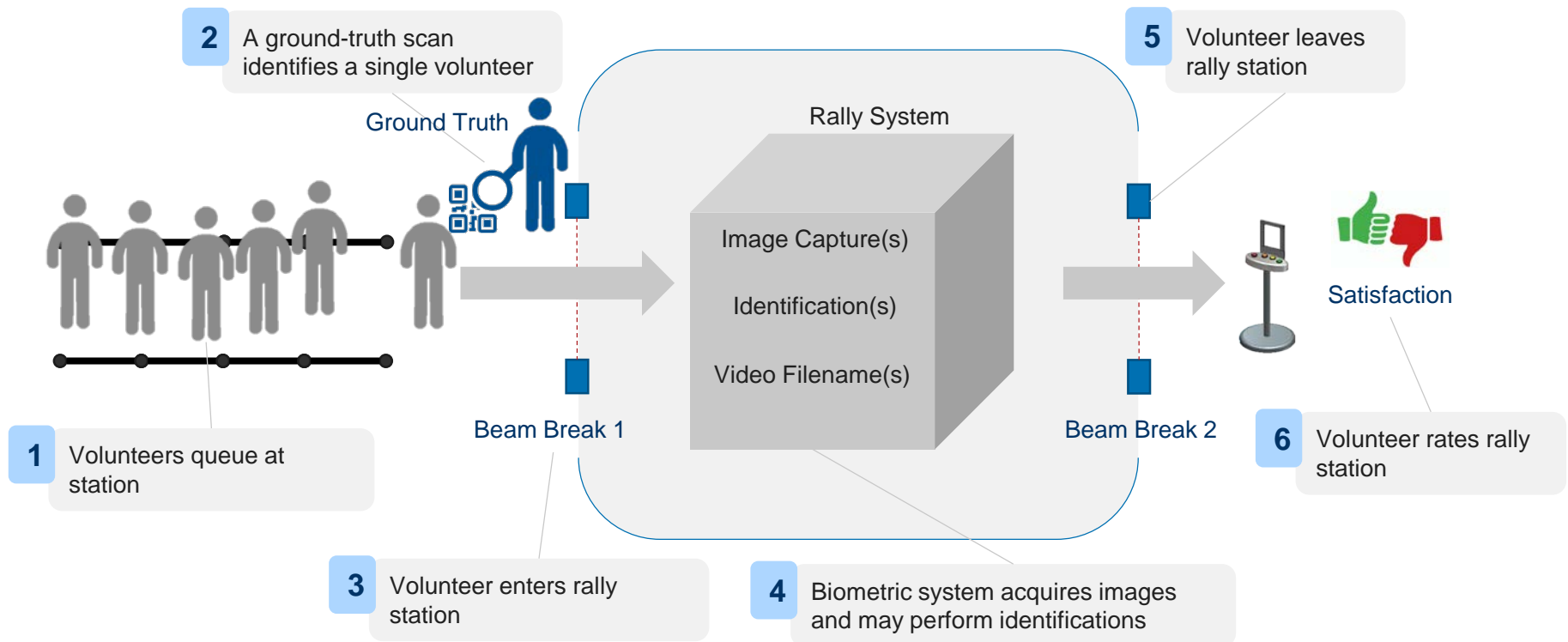    - Will not be specifically instructed on how to use the rally systems

# Testing Process – Rally Test

- Rally systems will be installed in one of up to 12 identical stations
  - Systems must fit into a 7'x8' station footprint
  - Power and network access will be provided, though will be constrained
  - Stations will be separated by physical barriers

- Volunteers will move in groups, visiting rally systems in a counterbalanced order
  - Volunteers will use the rally systems one at a time

- Test timing will be automated
  - Each group will be allotted a fixed amount of time with each system
  - Systems with ~10 second transaction times will be able to process the full group
  - Groups will move on when time expires, slower systems penalized

A B C D

# Testing Process – Rally Station



**2** A ground-truth scan identifies a single volunteer

Ground Truth

**5** Volunteer leaves rally station

Rally System

Image Capture(s)

Identification(s)

Video Filename(s)

Satisfaction

**1** Volunteers queue at station

Beam Break 1

Beam Break 2

**6** Volunteer rates rally station

**3** Volunteer enters rally station

**4** Biometric system acquires images and may perform identifications

# API Overview

- Rally systems have five "provides" requirements & options during the rally
  - *Provide* at least **one facial biometric probe image** per volunteer **(Required)**
  - *Provide* **up to three face biometric images** per volunteer **(Optional)**
  - *Provide* **up to three pairs of iris biometric probe images** per volunteer **(Optional)**
  - *Provide* **identifications** using a provided gallery of faces **(Optional)**
  - *Provide* up to **10 seconds of video** per volunteer **(Optional)**

- All data for a given volunteer must be submitted while that volunteer is at the station

- The MdTF will provide a RESTful, HTTP-based API to submit biometric data
  - Detailed API documentation
  - A comment and modification period
  - An API instance available publically for testing / debugging prior to the rally
  - Limited troubleshooting support

- During the rally, the API will be available only on the MdTF local area network
  - Systems must be able to configure the API server address and their Station ID
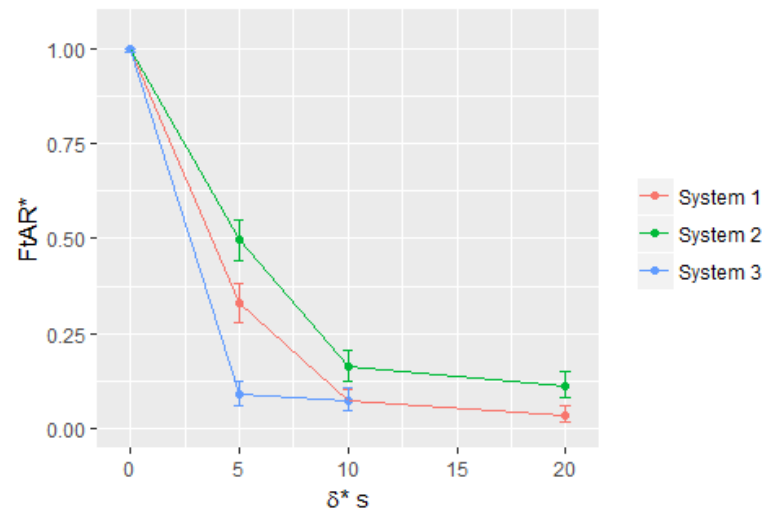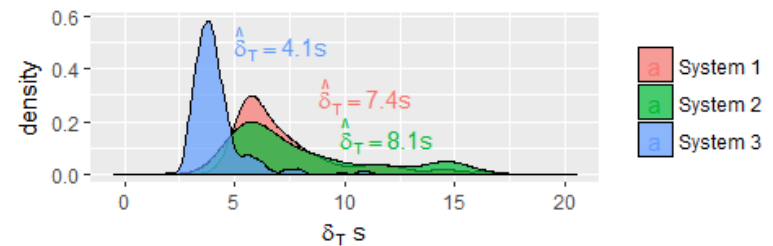  - Access to the internet will not be provided

api
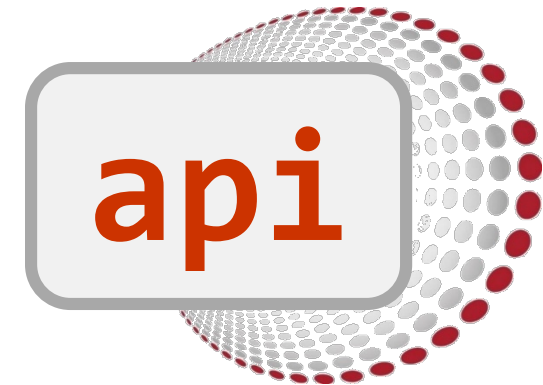
# Biometric Gallery

- Rally Participants that elect to perform **identifications** will be provided a gallery of face images during system installation at MdTF
  - Diverse demographics
  - Diverse image types and number of images per gallery ID
    - Sample images will be provided upon request

- Roughly 85% of the volunteers that will use rally systems during testing will have images in the gallery
  - Expect some volunteers to be out-of-gallery
  - Some individuals in the gallery will not be encountered

- Rally Participants performing identification will
  - Provide the gallery ID as determined by the system for each volunteer encountered
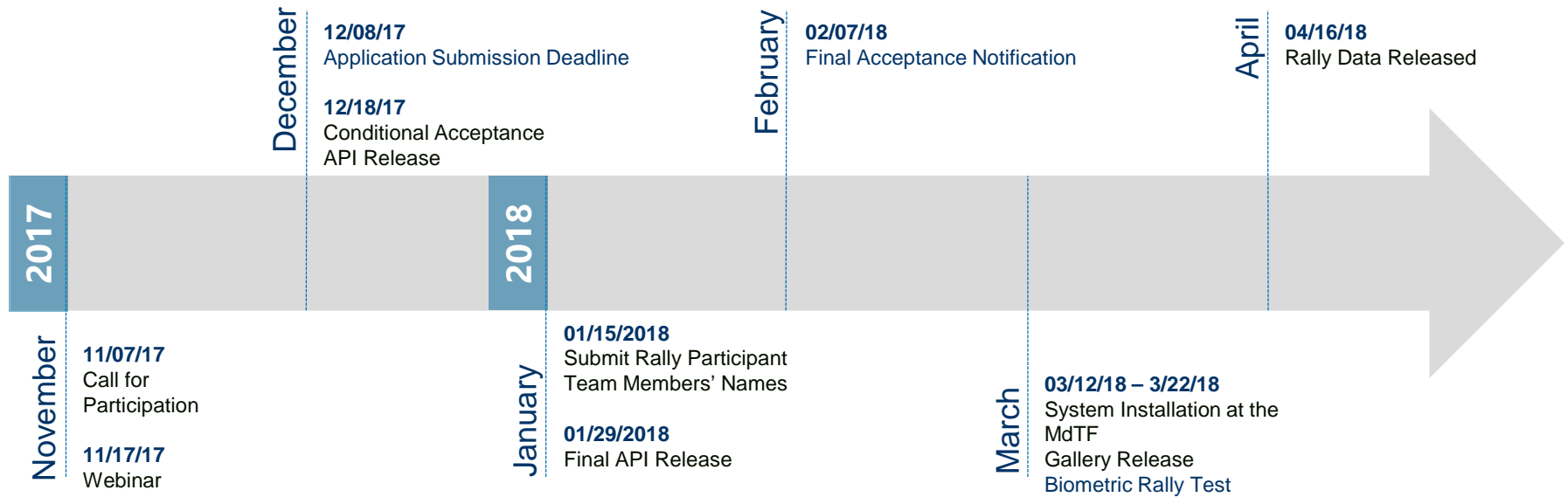  - Report out-of-gallery volunteers as specified in the API
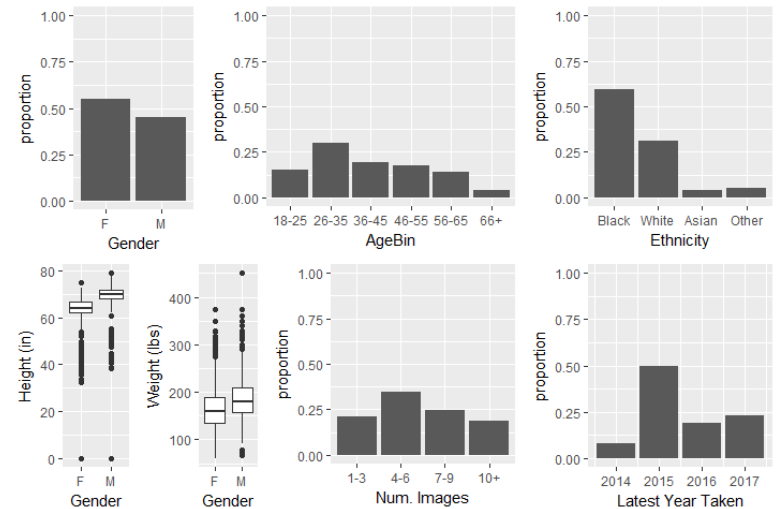
# Evaluation Metrics

- Focus on **tradeoff** between biometric efficiency and effectiveness both **within and across systems**
    - Efficiency – the amount of time required to complete a biometric transaction
    - Effectiveness – performance of the biometric, encompassing any failures to acquire, process, and match within a given time interval

- Gauge volunteer satisfaction with the systems

- Systems are expected to meet minimum requirements
    - **Produce imagery that enables the identification of at least 95% of all volunteers**
    - Maintain **average transaction time of 10 seconds**
        - Maximum transaction time of 20 seconds
        - Data collection will be stopped if allotted time is exceeded
    - Average top-box **satisfaction score of >90%**

# Rally Timeline

**December**

**12/08/17**
Application Submission Deadline

**12/18/17**
Conditional Acceptance
API Release

**February**

**02/07/18**
Final Acceptance Notification

**April**

**04/16/18**
Rally Data Released

**2017**

**2018**

**November**

**11/07/17**
Call for
Participation

**11/17/17**
Webinar

**January**

**01/15/2018**
Submit Rally Participant
Team Members' Names

**01/29/2018**
Final API Release

**March**

**03/12/18 – 3/22/18**
System Installation at the
MdTF
Gallery Release
Biometric Rally Test

# How to Participate

- Step 1: Submit formal interest via the rally website: http://mdtf.org/rally
- Step 2: E-mail an application package to rally@mdtf.org
    - A white paper (<5 pages) including
        - Overview of the technology
        - Descriptions of the complexity and maturity of the software required to control the device
        - Descriptions of the imagery acquired by the system
            - Include: type, size, resolution, etc.
        - Description of user interaction with the system
        - Detailed description of the optimal test environment
            - Include: size, footprint, temperature, humidity, standoff distance, gaze angle, focal range, etc.
        - Estimates of the system True Identification Rate
        - Estimates of the expected Failure to Acquire Rate
        - Estimates of the expected Transaction Time required to collect biometric imagery
        - System safety information, including eye safety

    - A video to demonstrate
        - System functionality demonstrating/corresponding with all items detailed in the white paper
        - System functionality demonstrating that it is possible for the system to operate in an unmanned environment

- DHS will have sole discretion in selecting participants. DHS S&T will down-select the number of Rally Participants to a maximum of 12. DHS will be advised in this process by a panel of biometric experts.

# Thank You

**Application deadline is December 8, 2017**

**For additional information and to submit formal interest go to:**
**http://mdtf.org/rally**