

# mFIT Challenge Phase 2 Kickoff Webinar



Hosted by the National Institute of Standards and Technology,  
Public Safety Communications Research Division and their Challenge Partners

MOBILE FINGERPRINTING INNOVATION TECHNOLOGY



# THINGS TO KNOW

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- Choose one of the following audio options:

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If you prefer to use your phone, you must select "Use Telephone" after joining the webinar and call in using the numbers provided.

- Participants will have a chance to participate in a live Q&A. To ask questions, please raise your hand and unmute yourself.
- A recorded version of the webinar will be available on the challenge website [www.mfitprize.com](http://www.mfitprize.com)
- Submit questions anytime to: [mFITprize@sensisagency.com](mailto:mFITprize@sensisagency.com). We'll post answers to FAQs on the website.



# Agenda

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- Welcome & PSCR Introduction
- mFIT Challenge Overview
  - What is the mFIT Challenge?
  - What is the Problem?
  - Phase 1 Summary
  - Phase 2 Expectations & Requirements
  - Phase 2 Prizes
  - Phase 2 Criteria
  - Phase 2 Evaluation
- How to Enter, Eligibility Requirements, and Submission Rules & Requirements
- Challenge Timeline
- Questions and Answers

# The Public Safety Communications Research(PSCR) **Mission**

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The Public Safety Communications Research (PSCR) division at the National Standards and Technology (NIST) is driven towards advancing public safety communications technologies by accelerating the adoption of and implementation of the most critical communications capabilities to ensure the public safety community can more effectively carry out their mission to protect lives and property.



# NIST PSCR Presenters

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# Disclaimer

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Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.

Please note, unless mentioned in reference to a NIST Publication, all information and data presented is preliminary/in-progress and subject to change



# mFIT Challenge Overview

# What is the mFIT Challenge?

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The mFIT Challenge is a two-phase competition that has awarded \$51,000 offers up to an additional \$302,500 in cash prizes with **a mission to discover innovative new or improved mobile applications** that access the available sensors on mobile devices to **capture high-quality digital fingerprint images**, thereby improving the performance and efficiency of identification in the field.





# What is the Problem?

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Today, there are commercially available, certified hardware peripheral devices (i.e., listed on Appendix F of the FBI Electronic Biometric Transmission Specification) that law enforcement personnel use in the field that are highly accurate, meet current standards, and are interoperable with fingerprint databases.

These devices tend to be portable and are mostly connected to smartphones, tablets, or laptops via cable or wireless communications to transfer files. The files may be stored, managed, or manipulated by a mobile application on a smartphone or tablet.

**However, these devices require agencies to purchase additional equipment and field officers to carry that equipment in addition to the large collection of equipment they already carry.**

**The ultimate objective of this challenge is to advance technology while preserving the form factor of the mobile device.**

# Phase 1 Summary

Phase One of the mFIT Challenge launched on September 17, 2021 and closed on October 18, 2021. Contestants submitted concept papers with their proposed solutions for employing mobile devices (phone or tablets) to capture fingerprints in the field.

In Phase One, Judges selected six teams to receive **\$8,500** each and **an invitation to compete in Phase Two.**

## Congratulations to the Phase 1 winners:

- **The Slapshot SDK Team** - [The Slapshot SDK](#)
- **Telos ID** - [mFIT Challenge Phase 1 Idea Submission](#)
- **Identy Inc.** - [Concept Paper for mFIT](#)
- **IDEMIA** - [IDEMIA Mobile Biometric Check](#)
- **BlueBible Team** - [Contactless Fingerprint Capture Using Chessboard Detection & Generative Adversarial Networks](#)
- **ENGR Dynamics** - [FOCAL \(Fingerprint Optical Contactless Acquisition Logic\)](#)

# Phase 2 Expectations & Requirements

## Phase 2 Expectations:

- During this final phase of the mFIT Challenge, contestants will develop an application for a mobile device that will allow law enforcement officers to capture high-quality digital fingerprint data without the need to carry additional equipment.
- Contestants are asked to submit a mobile device loaded with a functioning application that captures fingerprint image files on the left and right hands (including index and middle fingers).

## Walk-On Contestant Option:

- Walk-on contestants are contestants who meet all eligibility requirements defined in these Official Rules.
- To compete in Phase 2, Walk-on contestants will submit all materials required for Phase 2.
  - A template will be provided for the letter of intent and the confirmation of watching the Phase 2 webinar.
- Walk-on contestants will not receive prize awards associated with Phase 1 during the Phase 2 competition.

# Phase 2 Prizes

## Virtual Demonstration, Evaluation of Prototypes, and Open Source Contest [up to \\$302,500](#)

The three highest scoring submissions from Criteria 1- 4 may receive the 1st, 2nd and 3rd place prizes

- 1st place cash prize (1): **\$100,000**
- 2nd place cash prize (1): **\$60,000**
- 3rd place cash prize (1): **\$30,000**

### Optional Prizes

- First Responder's Choice Award (1): **\$12,500**
- Innovation Prizes: [Up to 5](#) Innovation Prize Winners may win **\$4,000** each for outstanding innovation.
- Open Source Awards: [Up to 10](#) Open Source awards of **\$8,000** each will be made to participants who share their full source code and/or complete device specifications in a public repository.

# Phase 2 Criteria

## **Criterion 0: Compliance Testing (Pass/Fail)**

- Safety
- Operational
- Captures digital images as PNG (500 ppi  $\pm$  5 ppi)
- Stores multiple fingerprints as a packaged file

## **Criterion 1: Efficiency and Effectiveness (60%)**

- (discussed in the next 7 slides)

## **Criterion 2: Feasibility (15%)**

- Cost per deployment
- Ability to deploy the system within four years

## **Criterion 3: User Satisfaction and Ease of Use (15%)**

- Ease of use
- Speed of collection and processing
- Convenience of form factor
- User satisfaction

## **Criterion 4: Innovation and Creativity (10%)**

- An evaluation of the novel approach taken by the contestant that is an outstanding technological innovation or has the potential for exceptional impact on the public safety community.

# Phase 2 Evaluation (1 of 7)

## Evaluation Procedures for Criterion 1: Effectiveness and Efficiency

Our team of subject matter experts developed a robust plan for evaluating prototypes against certified devices. We provide the following information for transparency.

1. Stations setup to collect new fingerprint images from--
  - a. EBTS Appendix F Certified Devices
  - b. Submitted prototypes from contestants
2. Approximately 50 volunteers provide multiple sets of fingerprint images at each station
3. Fingerprint images are organized and stored on servers for evaluation

# Phase 2 Evaluation (2 of 7)

## Evaluation Procedures for Criterion 1 (cont.)

4. Matching/Analysis using evaluation software
  - “Control” matching and analysis, comparing the same fingerprint image sets to each other
  - Compare all sets of prototype fingerprint images to images from multiple Appendix F certified devices
5. Compare and analyze scores

# Phase 2 Evaluation (3 of 7)

**Evaluation Location:** NIST PSCR Lab, Boulder Colorado

## **Lab Configuration:**

- **Isolated Subnet on PSCR Demonstration Network**
  - Limited Internet Access, Wi-Fi available
  - No access to other PSCR DemoNet subnets
- **Virtual Servers**
  - Matching and Evaluation Software
    - [Source AFIS](#) (with automation software)
    - NIST Published Evaluation Software (currently Beta Version; may be available February 15, 2021)



# Phase 2 Evaluation (4 of 7)

## Lab Configuration (cont.):

- **Laptops, multiple**
  - Used to collect fingerprint images from EBTS Appendix F Certified devices
  - Images are collected on Laptops and transferred to servers
- **EBTS Appendix F Certified Devices, multiple**
- **Mobile Hardware Development Kit (HDK)**

# Phase 2 Evaluation (5 of 7)

## Submission Requirements

- Contestant thoroughly explains access instructions to prototype mobile device and all applications
- Fingerprint image files are easy to transfer from prototype submission to server or laptop (contestant provides instructions)
  - We prefer to transfer files via USB cable to a laptop.
- Be very precise in your instructions on the fingerprint capture procedures. We recommend including this in your submission video as well.

# Phase 2 Evaluation (6 of 7)

## Submission Requirements (cont.)

- Fingerprint Image file names
  - **Mandatory:** Clearly identify the finger the image was captured from. If multiple finger images are captured at once, individual fingers are well labelled in separate files.
- **Preferred:**

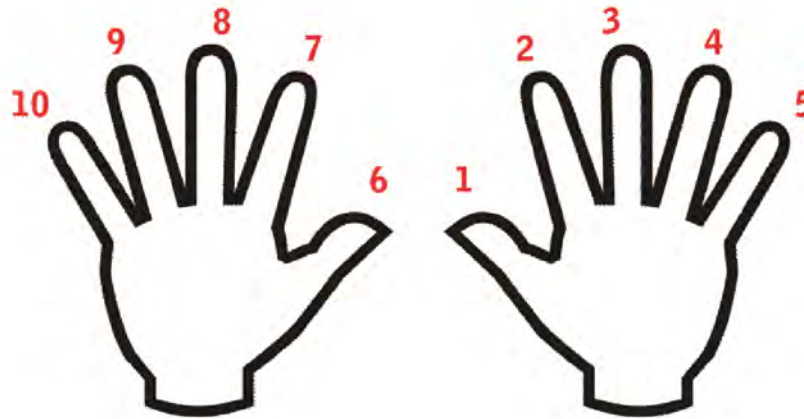


Figure 1 Finger Numbering Methodology

# Phase 2 Evaluation (7 of 7)

## Submission Requirements (cont.)

- Fingerprint Image file names
  - **Preferred:**
    - Includes the name of the contestant or product you submitted
    - Mobile application has an option to enter a name or a unique identifier of the subject being fingerprinted, and that name or identifier is included in the file name
      - Mobile application allows for multiple sets of fingerprint images for each subject, and labels each set clearly in the file name
  - **Ultimately, if using the full preferred file naming structure:**
    - TeamAwesome\_Subject-241\_Set-2\_Finger-9.png (metadata has date/time stamp)

**How to Enter, Eligibility  
Requirements, Submission  
Rules & Requirements, and  
Challenge Timeline**

# How to Enter & Submit

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## Phase 2 Submission Dates & Details:

### March 14, 2022:

- Register for the challenge by completing the online registration form at <https://www.mfitprize.com/register-form/>.
- Walk-on contestants and Phase 1 Winners send their **letters of intent** to enter Phase 2 of the challenge.

### April 4, 2022:

- PSCR **receives** prototypes.
- Contestants upload materials to the designated cloud storage environment by this date at 11:59 PM (ET).
- Contestants who choose to compete for an Open Source Award upload the URL of the repository containing their open-sourced code and/or device specifications and license by this date at 11:59 PM (ET).

**May 4, 2022:** Phase 2 Winners announced

# Contestant Eligibility Requirements

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Please read the eligibility requirements in the [Official Rules](#) for complete definitions (pp 15-18).

- **Enter as an individual or team.** Teams may be private entities, academic groups, clubs, or a collection of individuals - *reach out to colleagues and create your team!*
- The **Official Representative** must meet the eligibility requirements in the Rules (pp 18-19; e.g., 18 years or older, US citizen or permanent resident of US/territories, if private entity - incorporated in US and primary place of business is in the US/territories).
- Refer to the Rules for terms for Federal employees, NIST associates, contractors, and former employees/associates.
- **Current NIST grantees** are eligible to participate but may not use NIST funding toward their submissions.
- **Current/past NIST Challenge Participants** are eligible to participate.
- **NIST CRADA Collaborators** are eligible to participate if the CRADA does not provide the contestant with access to NIST information, equipment or other resources which could provide the contestant with an advantage. (Rules page 17).

Please email [psprizes@nist.gov](mailto:psprizes@nist.gov) with the subject line **mFIT** for questions on eligibility.

# Phase 2 Submission Rules

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- Walk-on contestants will register for this challenge by completing the online registration form on <https://www.mfitprize.com/register-form/> and accepting the terms and conditions of participation for entry.
- Phase 1 winners and Walk-on contestants will submit their letter of intent to enter Phase 2 of the mFIT Challenge via email to [mFITprize@sensisagency.com](mailto:mFITprize@sensisagency.com) by **April 4th, 2022**.
  - Contestants will include in their letter of intent and a statement confirming they attended or watched the recorded Phase 2 kickoff webinar by **March 14th, 2022**.
- All Phase 2 contestants will submit their complete entry by the **April 4, 2022**.
- All contestants who wish to be considered for an Open Source Award must deposit the entire source code of their submission and all specifications needed to replicate hardware and related documentation into a public software repository accompanied by a permissive open source license. Contestants must provide the URL to their repository by the date provided in the Important Dates section of this document. Submission to the Open Source contest is optional and does not influence eligibility for other awards.



# Phase 2 Submission Requirements

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## **Submit the mobile fingerprint application along with mobile device, including:**

- Charging cable and necessary passcodes to operate the device
- Additional sensors and “add-on solution” components (if applicable)
- Instructions on how to use their solution (e.g., readme file)

## **Submit document (not exceeding 4 pages) explaining the following:**

- The technical gaps addressed
- What technical improvements are offered by their solution
- An estimate of the timeline and cost for a public safety agency to implement the technology.

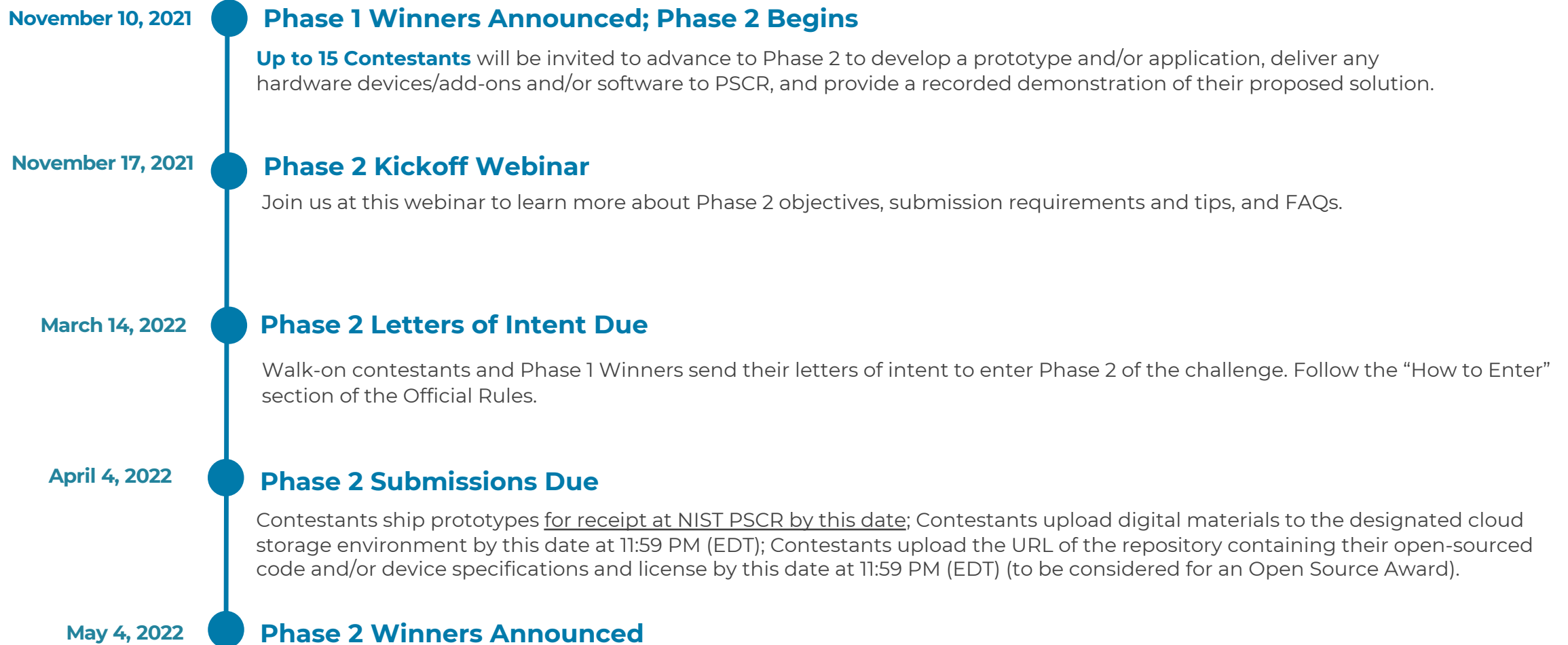
## **Submit Demonstration Video (Not to exceed 20 minutes)**

- The video shall include a recorded walk-through and voice-over demonstrating the full explanation of the solution, explain what technical gaps are addressed and what technical improvements were made. In addition, the demonstration video shall include an explanation of a law-enforcement use case and how the solution addresses it.

## **Ship prototypes and upload digital materials by April 4th, 2022**

- A delivery address is forthcoming. The address will be posted on [mfitprize.com](https://mfitprize.com) by Friday, March 4, 2022.

# Challenge Timeline - Upcoming Dates



# Thank You



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