Data Collection

+ **Baseline Legacy (BL)**
  - Gold standard rolled 10 print enrollment with skilled operator A (BL_N2N_A)
  - Gold standard rolled 10 print enrollment with skilled operator B (BL_N2N_B)
  - Latent Collection via gold standard methods (BL_L)
  - Government may collect other data not used in challenge

+ **Prize Participant (PP)**
  - Collect N2N using no skilled operator and whatever hardware/software the prize participant provides (PP_N2N)
Collection Time

– The time how long it takes to capture each session of N2N data will be a factor for the prize challenge
– Legacy N2N time for the US Government captured data will be referred to as M_L_T (Metric Legacy Time)
– Performer N2N time will be referred to as M_P_T (Metric Performer Time)
– Prize challenge metric/test: lowest median time to acquire fingerprint
  – Median × (1 + |skew|)
  – Tie-breaker: Lowest median time to capture a fingerprint
Recognition Criteria

<table>
<thead>
<tr>
<th>BL_N2N_A</th>
<th>BL_L</th>
</tr>
</thead>
<tbody>
<tr>
<td>(10 Print Legacy Baseline Operator A)</td>
<td>Baseline Latent Set</td>
</tr>
<tr>
<td>Metric Legacy Gallery Biometric (M_L_GB)</td>
<td>Metric Legacy Latent Biometric (M_L_LB)</td>
</tr>
<tr>
<td>Metric Prize Participant Gallery Biometric (M_P_GB)</td>
<td>Metric Prize Participant Latent Biometric (M_P_LB)</td>
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</tbody>
</table>

+ **FNIR @ FPIR = 10^{-1}**
+ **Tie-breaker:** Average NFIQ 2.0 values and NFIQ 2.0 feature values
  - Frequency Domain Analysis Standard Deviation
  - Frequency Domain Analysis Mean
  - Ridge Valley Uniformity Mean
  - Ridge Valley Uniformity Standard Deviation

+ False Positive Identification Rate (FPIR) = fraction of searches for which there is no mate in the enrolled set (N), but a candidate above a certain similarity threshold (T) was incorrectly returned at or above a pre-specified rank (R).

+ False Negative Identification Rate (FNIR) = the fraction of searches for which there is a mate in the enrolled set (N), but the mate was not returned at a pre-specified rank (R) above a certain known similarity threshold (T).
Master Builder:
+ This prize is for any contestant or team that is invited to and attends the Live Test at the test facility. There is one prize for each team that attends, totaling 12 available prizes.
  – Eligibility Criteria
    – Complete Stage 1, Complete Stage 2, Receive Stage 3 Live Test Invitation, and attend the Live Test at the test facility

Print Provider:
+ This prize is for any team that is invited to, attends the Live Test at the test facility, and provides all collected prints for IARPA research. There is one prize for each team that provides their prints, totaling 12 available prizes.
  – Eligibility Criteria
    – Provide all collected prints from the Live Test at the test facility.

Prize: Master Builder - $2,000 & Print Provider - $8,000
Prize: Gallery Accuracy $25,000

+ This prize is for N2N matching
  – Winner:
    – Best N2N to N2N matching performance
      – Best M_P_GB
  – Eligibility Criteria
    – Device cannot be more than twice as slow as existing approaches
      – $M_P_T < 2*M_L_T$
    – 90% of subject data captured
Prize: Latent Accuracy $25,000

+ This prize is for best latent matching
  – Winner:
    – Best N2N to Latent matching performance
    – Best M_P_LB
  – Eligibility Criteria
    – You cannot be more than twice as slow as existing approaches
      – M_P_T < 2*M_L_T
    – 90% of subject data captured
This prize is for fastest capture time

Winner:

- Fastest N2N capture time
  - Best M_P_T

Eligibility Criteria

- Latent matching must be within 80% of the N2N baseline method
  - $M_{P\_GB} > 0.8 \times M_{L\_GB}$
- 90% of subject data captured

Prize: Speed $25,000
Challenge Grand Prize: $100,000

+ **Best Useable Matching System**
  - **Winner:**
    - Best Latent Matching System
      - Best M_P_LB
  - **Eligibility Criteria**
    - Device must be no more than 20% slower than existing approaches
      - \( M_P_T < 1.2 \times M_L_T \)
    - N2N matching performance must be no more than 2% worse than legacy/baseline
      - \( M_P_GB > 0.98 \times M_L_GB \)
    - Latent matching performance must be no more than 2% worse than legacy/baseline
      - \( M_P_LB > 0.98 \times M_L_LB \)
    - 90% of subject data captured