Current Fingerprint Initiatives at FBI's Criminal Justice Information Services (CJIS) Division

International Face and Fingerprint Performance Conference (IFPC)
April 1-3, 2025

Presentation Topics

- Common Fingerprint Submission Issues
- Dataset Collections

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Common Fingerprint Submission Issues

Common Fingerprint Submission Issues

- Some agencies are submitting plain images as rolled images to Next Generation Identification (NGI).

- Ghost images
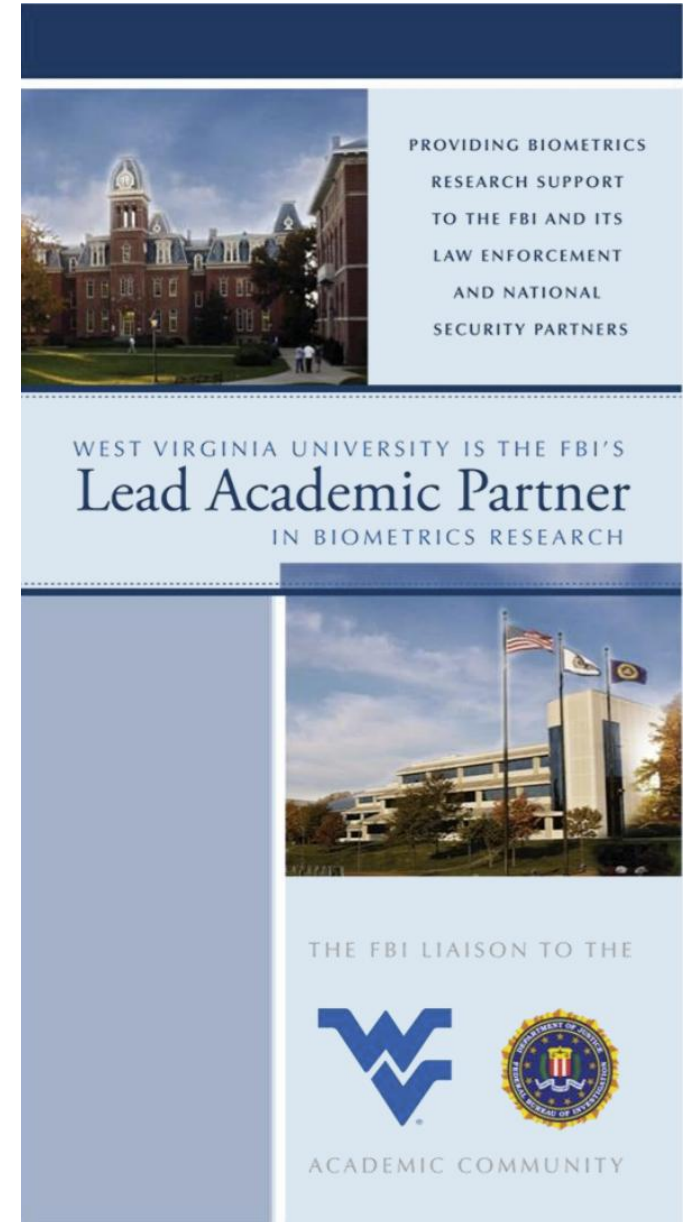
- Overlays

- Mobile device collection

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Dataset Collections

West Virginia University Cooperative Research Agreement (WVUCRA)

Serves as the FBI's link to academic institutions across the country.

PROVIDING BIOMETRICS RESEARCH SUPPORT TO THE FBI AND ITS LAW ENFORCEMENT AND NATIONAL SECURITY PARTNERS

WEST VIRGINIA UNIVERSITY IS THE FBI'S
Lead Academic Partner
IN BIOMETRICS RESEARCH

THE FBI LIAISON TO THE

ACADEMIC COMMUNITY

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Environmental Contactless Fingerprint Data Collection

Building a dataset of contactless fingerprint images collected from 1,000 individuals in real-world environments to determine the effects of lighting, weather, and elements.

- Contact fingerprints will be captured using Kojak Sherlock

- Contactless fingerprints will be captured using:
  - MorphoWave
  - Smartphones with Sciometrics and Veridium apps *(not all apps compatible with all phones)*
    - iPhone 15 Pro Max
    - Samsung Galaxy S24 Ultra
    - Google Pixel Pro 8

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Environmental Contactless Fingerprint Data Collection (cont.)

- Images captured under the following conditions:
  - Normal lighting
  - Low lighting and flashing police-style lights
- Participants will be asked to:
  - Handle chalk or modeling clay
  - Wash their hands
  - Place hands in warm water until they begin to wrinkle (avg. 5 to 10 minutes)

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Environmental Contactless Fingerprint Data Collection (cont.)

- Failure to acquire attempts across various conditions as well as number of attempts to capture will be tracked

Wrinkled hands, normal lighting, iPhone 15 Pro Max, Veridium, contact equivalent middle finger

Police lights, Samsung S24, Sciometrics, index crop and contact equivalent middle finger

Lights off (phone flash), iPhone 15 Pro Max, Veridium, contact equivalent middle finger

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Environmental Contactless
Fingerprint Data Collection (cont.)

- Completion Date: Spring 2026

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Crime Scene Latent Fingerprint Collections

Create a dataset of known-source impressions of crime scene quality collected under informed consent, indexed for easy searchability, and using a wide variety of substrates and development techniques to mimic casework.

- 3 sets of exemplars from 150-200 donors
- Contactless fingerprints will be captured using:
  - Idemia 1.0 Mobile Biometric Check
    - iPhone 14 Plus
  - Integrated Biometrics Slapshot
    - Galaxy S20 FE 5G

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Crime Scene Latent Fingerprint Collections (cont.)

- Use a variety of substrates, pressure, distortions, and development techniques with some additional matrices (e.g., blood)

	Substrates	Light Plain	Light Twist Clockwise	Light Twist Counterclockwise	Light Lateral Left	Light Lateral Right	Light Lateral Up	Light Lateral Down	Normal Plain	Normal Twist Clockwise	Normal Twist Counterclockwise	Normal Lateral Left	Normal Lateral Right	Normal Lateral Up	Normal Lateral Down
Porous	White Paper	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Cardboard	10	5	5	5	5	5	5	10	5	5	5	5	5	5
	Newspaper	10	5	5	5	5	5	5	10	5	5	5	5	5	5
	Wood (untreated)	4	1	1	1	1	1	1	5	2	2	2	2	2	2
	Wood (tongue depressors)	4	1	1	1	1	1	1	5	2	2	2	2	2	2
Non-Porous	Glass (Window)	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Cans	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Aluminum Tape	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Non-Adhesive Tape	10	5	5	5	5	5	5	10	5	5	5	5	5	5
	Plastic Grocery Bags	20	5	5	5	5	5	5	20	10	10	5	5	5	5
Adhesive	Packing Tape	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Masking Tape	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Duct Tape	20	5	5	5	5	5	5	20	10	10	5	5	5	5
Wet	Cans/Bottles	10	1	1	2	2	2	2	10	5	5	4	4	4	4
	White Paper	4	1	1	1	1	1	1	5	2	2	2	2	2	2
Semi-Porous	Fast Food Cups	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Glossy Magazines	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Parchment Paper	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Styrofoam	4	1	1	1	1	1	1	5	4	4	2	2	2	2
Curved	Bouncy Balls	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Straws?	10	5	5	5	5	5	5	10	5	5	5	5	5	5
Textured	Bouncy Balls	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Citrus	10	5	5	5	5	5	5	10	5	5	5	5	5	5
	Rough Folders	20	5	5	5	5	5	5	20	10	10	5	5	5	5
	Slime	10	5	5	5	5	5	5	10	5	5	5	5	5	5
Blood	White Paper	4	1	1	1	1	1	1	5	2	2	2	2	2	2
	Can/Bottle	4	1	1	1	1	1	1	5	4	4	2	2	2	2
	Linoleum/Vinyl	4	1	1	1	1	1	1	5	2	2	2	2	2	2
Other	Any construction materials														
	Estimated Totals	250	25	25	50	50	50	50	400	200	200	100	100	100	100

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Crime Scene Latent Fingerprint Collections (cont.)

- Completion date: Winter 2025

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Postmortem Variability of Biometrics

Collect biometric data using postmortem human subjects donated to the University of Tennessee's Forensic Anthropology Center (FAC) and placed at the Anthropology Research Facility located in Knoxville, Tennessee.

- Antemortem collections
- Fingerprints are captured using
  - Northrop Grumman BioSled
  - HID SEEK
  - InCadence Ares

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Postmortem Variability of Biometrics

- Total number of donors
  - 337 gallery
  - 207 longitudinal
- Donors with AM/PM Data
  - 50 total, 38 longitudinal

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Postmortem Variability of Biometrics (cont.)

- Collection ongoing

Current Fingerprint Initiatives at FBI's Criminal Justice Information Services (CJIS) Division

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