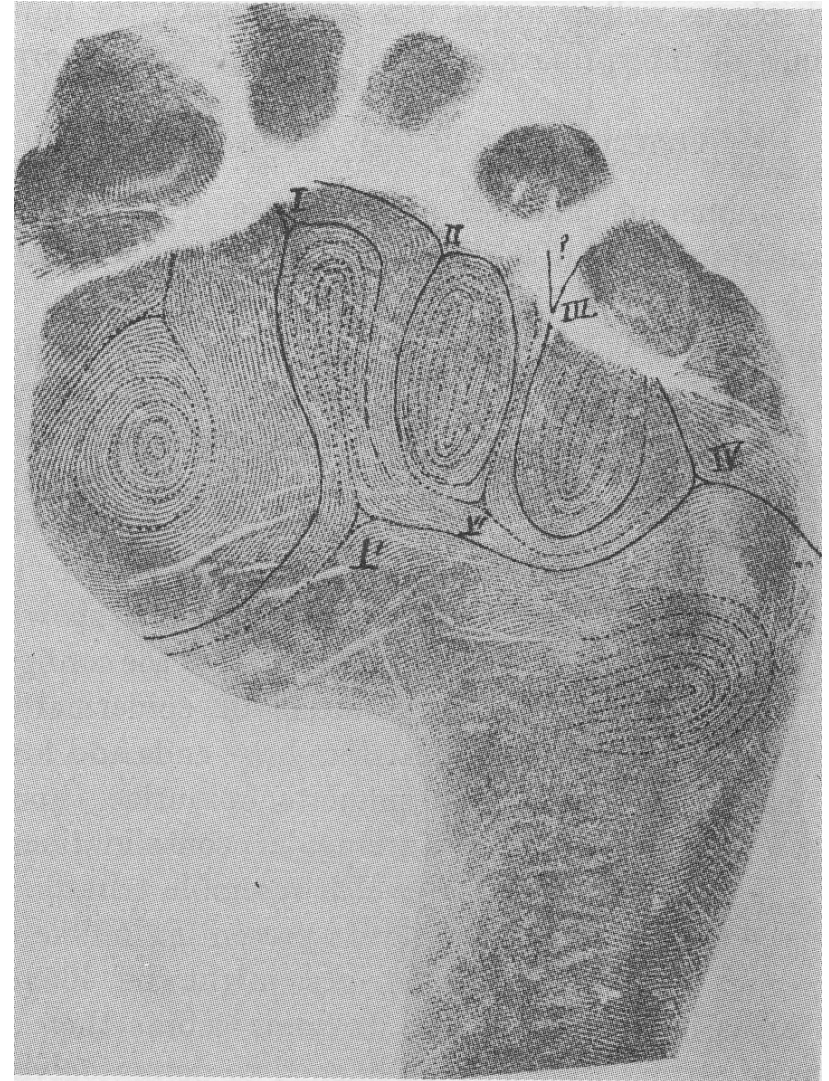# Fingerprints and Palmprints: Research Datasets

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Friction Ridge Patterns

Cummins and Midlo, Finger Prints, Palms and Soles, Dover, 1961

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Fingerprint Applications: Data Requirements

- Forensics
  - Latents & exemplar
- Law enforcement
  - Rolled & slap
- Homeland Security
  - Slap
- Consumer/financial
  - Access control (Disney)
  - Mobile device (iPhone, Goodix)

Palmprint Applications:
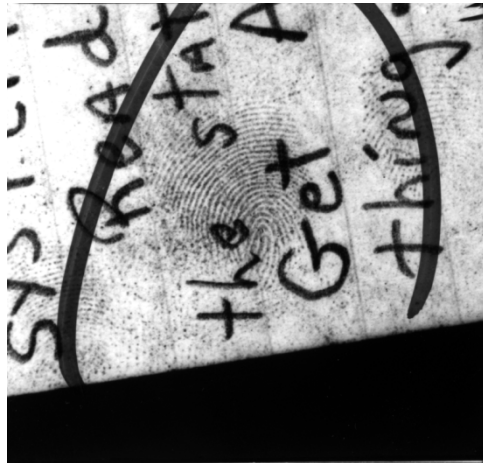# Data Requirements

- Forensics
  - Latent & slap palmprints (high resolution)

- Access Control
  - Slap palmprints (mostly low resolution)

Public Domain Fingerprint Databases

Type	Database	Data size	Year released	Comments
Latent & exemplar fingerprints	NIST SD27	258 latents & mates	2000	Latent matching research
	WVU	449 latents & mates	2008-2010	
Rolled	NIST SD4	2,000 X 2 fingerprints	1992	Classification and matching research
	NIST SD14	27,000 X 2 fingerprints	2002	
Digital video	NIST SD24	100 fingers	1998	50 males and 50 females
High resolution	NIST SD30	360 fingerprints	2001	Both 500 and 1000 ppi
Optical FTIR, capacitive & sweep	FVC	17,760 fingerprints of 2,360 fingers	2000, 2002, 2004, 2006	Including real and synthetic fingerprints
	Cross device	77,760 fingerprints of 720 fingers	2012	9 sensors
Spoof	LivDet	44,000 prints; spoof made of 5 materials	2009,2011, 2013	Fake and real fingerprints

Example Latent Fingerprints

Example from NIST SD27

Example from WVU database

Latents

Mates

Example Plain Impressions

Optical sensor by
CrossMatch

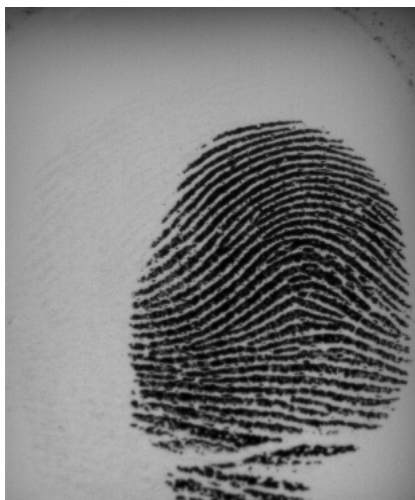Optical sensor by
Digital Persona

Sweeping sensor
by Atme

Synthetic
fingerprint
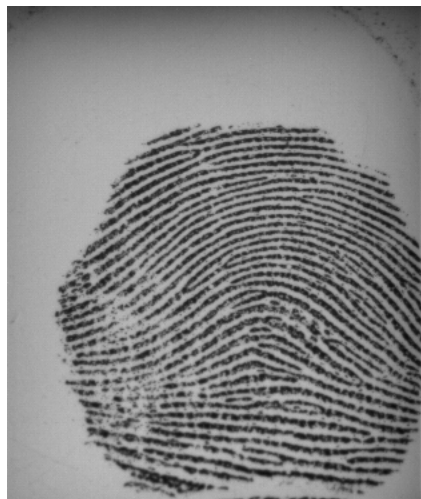
Fingerprints from FVC2004
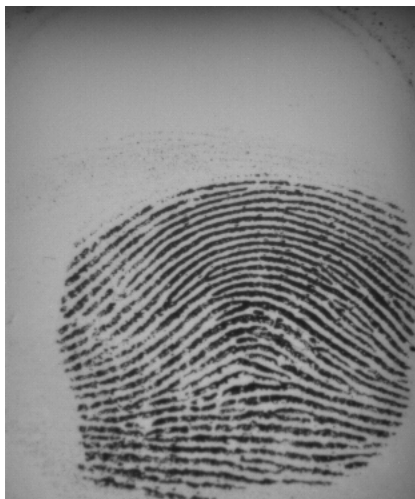
Example Spoof Fingerprints
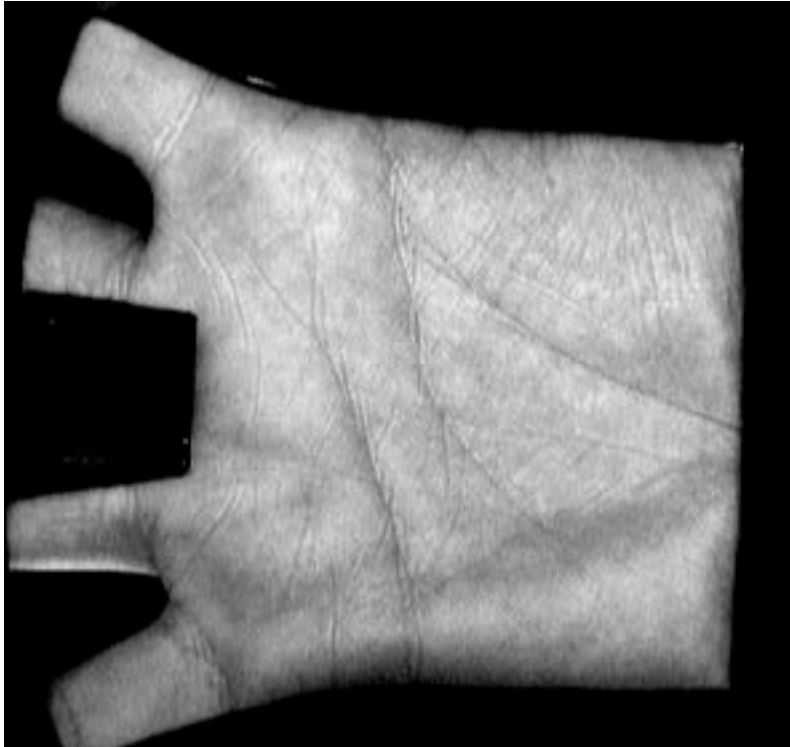

Real fingerprint

Ecoflex

Gelatin

Latex

Silicone

Woodglue

Public Domain Palmprint Databases

Type	Database	Data size	Year released	Comments
Low resolution (~100 ppi)	PolyU palmprint	7,752 palmprints	2003	386 different palms
	PolyU Multispectral palmprint	6,000 palmprints	2008	250 subjects
High resolution (500 ppi)	THUPALMLAB	1,280 palmprints	2011	80 subjects
Latent palmprint	LPIDB v1.0	380 latent palmprints and mates of 100 different palms	2014	28 males and 23 females

Example Palmprint Images

A 75 ppi palmprint

A 500 ppi palmprint

Research Problems in Need of Large Friction Ridge Data

- Train deep networks to learn (i) friction ridge models, and (ii) fingerprint similarity

- Scalability studies of AFIS

- Analyze individuality of friction ridge patterns

- Persistence of friction ridge accuracy; longitudinal study

- Minimum age at which fingerprints can be collected