



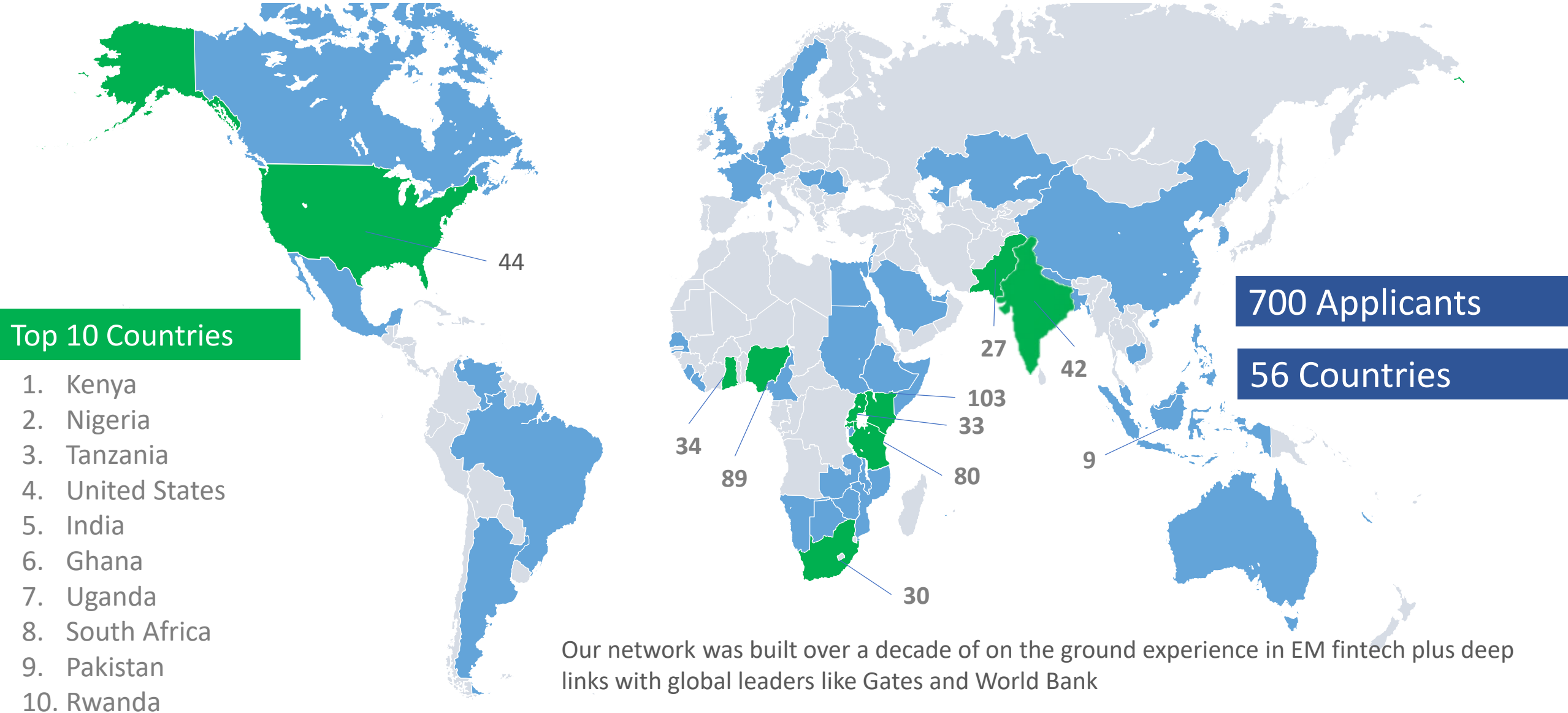
D F S
L A B

ID4Africa

**Fingerprints
without
hardware**

The **DFS Lab** is an early stage accelerator supporting the next generation of breakthrough fintech products in Africa and South Asia

DFS Lab attracts 100s of applicants and surfaces the very best from a deep well of untapped local potential





Our founders: a diverse pool of inventors and entrepreneurs from around the world

Opportunity landscape

26 days

Average financial KYC onboarding globally

>\$100

Deployed-cost of low-end biometric reader

\$5

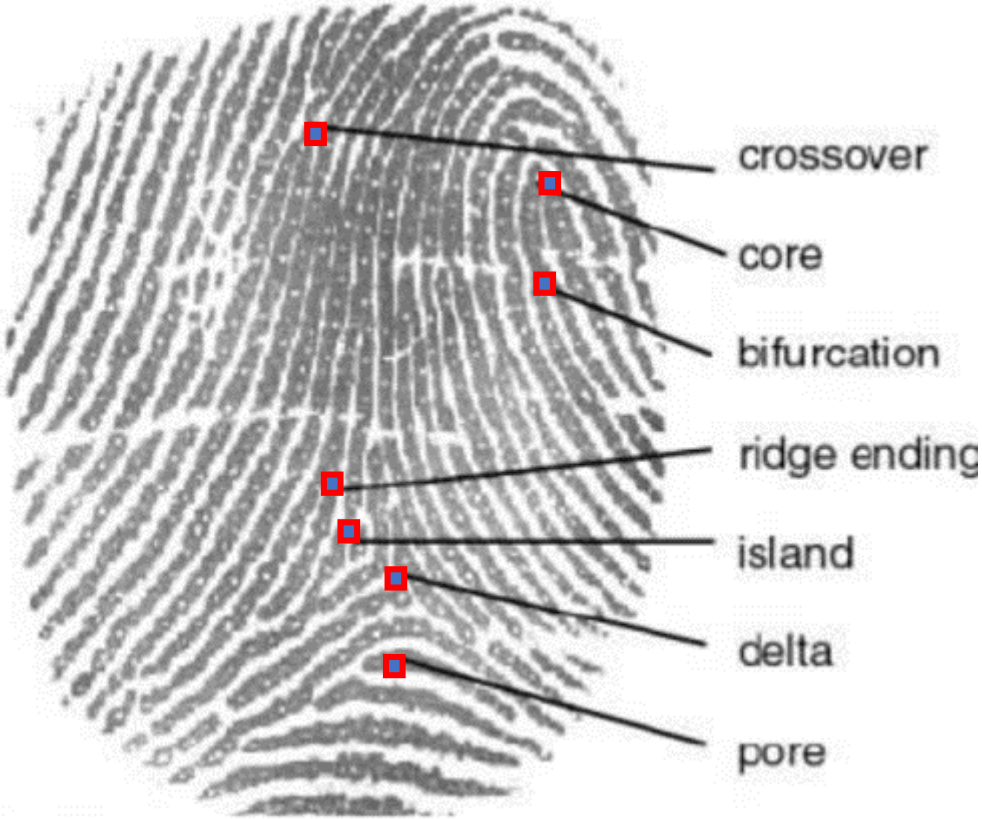
Estimated KYC costs per customer in India

3.3 Bn

Smartphones in the global south by 2020

Biometrics Challenge

Can we capture fingerprints via standard Android camera?



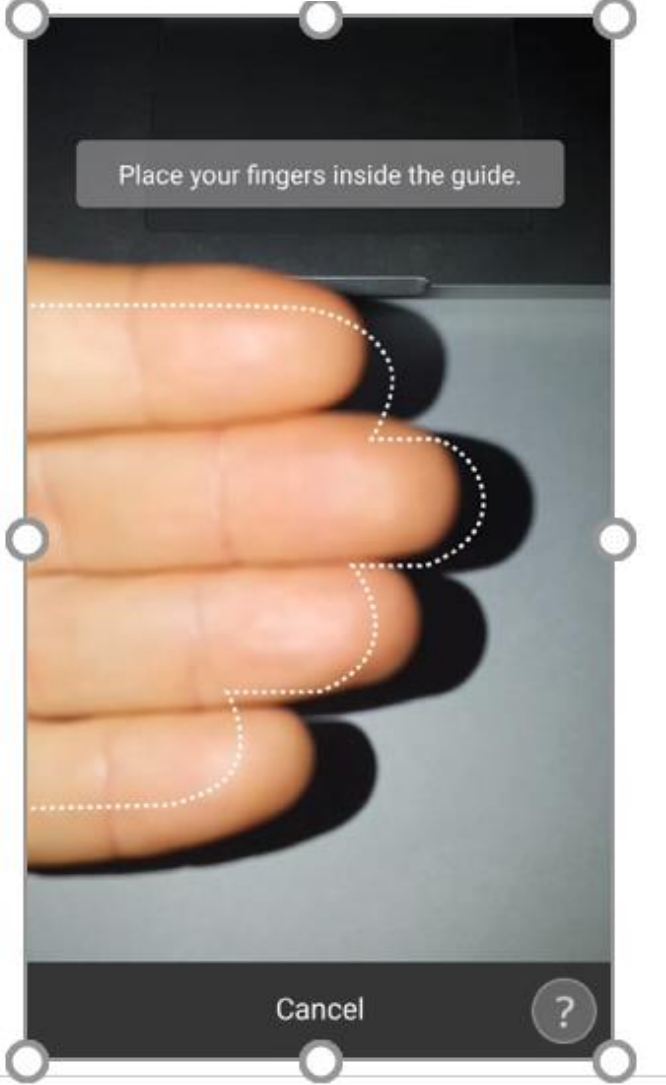
Two Teams



DIAMOND FORTRESS
TECHNOLOGIES

VERIDIUM
HANDS ON SECURITY

Wala



Challenges

General Phone Challenges

- Finger orientation
- Lighting
- Camera focus and capture
- Phone differences
- UI/UX is more complex
- Interoperability key to KYC

Specific Eval. Challenges

- Somewhat artificial situation
- Vendors had to create new UX
- No ability to iterate to optimize performance
- Our choice on hardware

Evaluation

- Compare fingerprint via phones camera against slap readers
- Verification for ~300 subjects with different demographics



Challenge: contactless v. contact-based (legacy) fingerprint matching

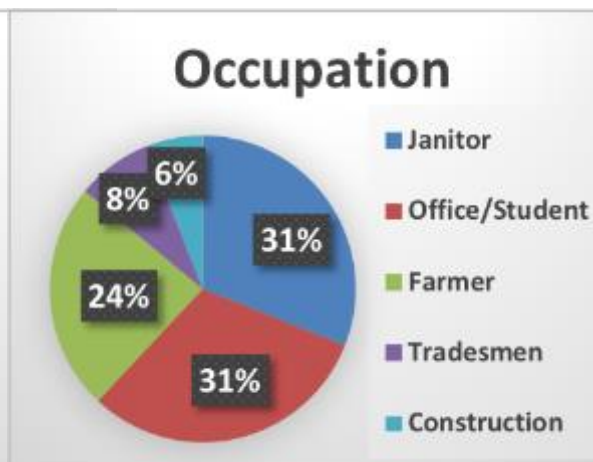
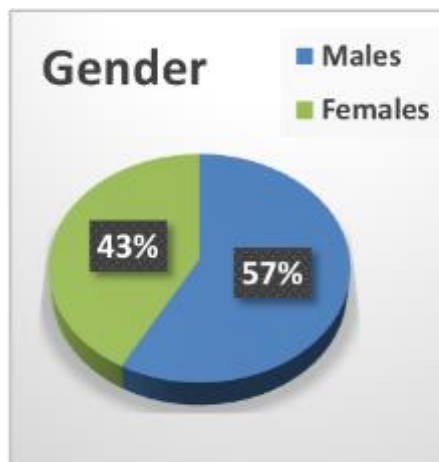
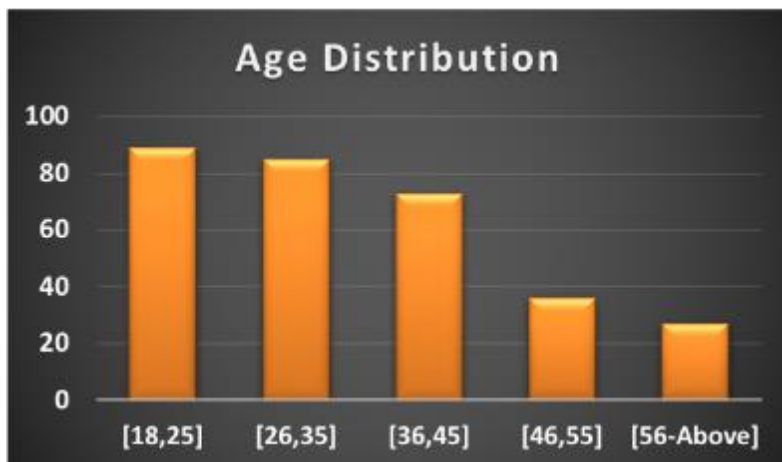
Collaborators:

Anil Jain, Michigan State University, USA

Neeta Nain, Malaviya National Institute of Technology, Jaipur, India

Diverse subject demographics

Total no. of Subjects: 309



Challenging edge cases

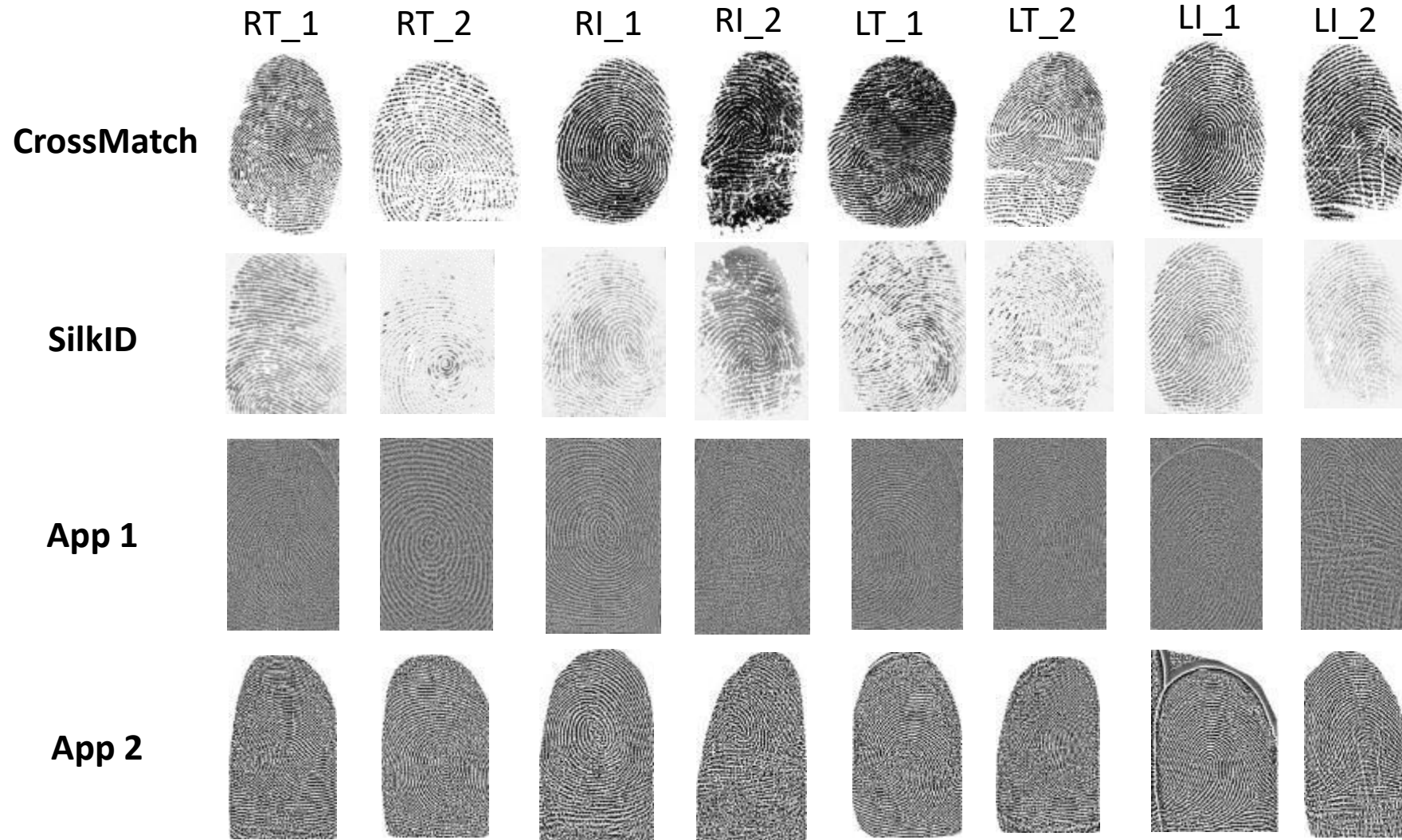


Worn out/Damaged Fingers

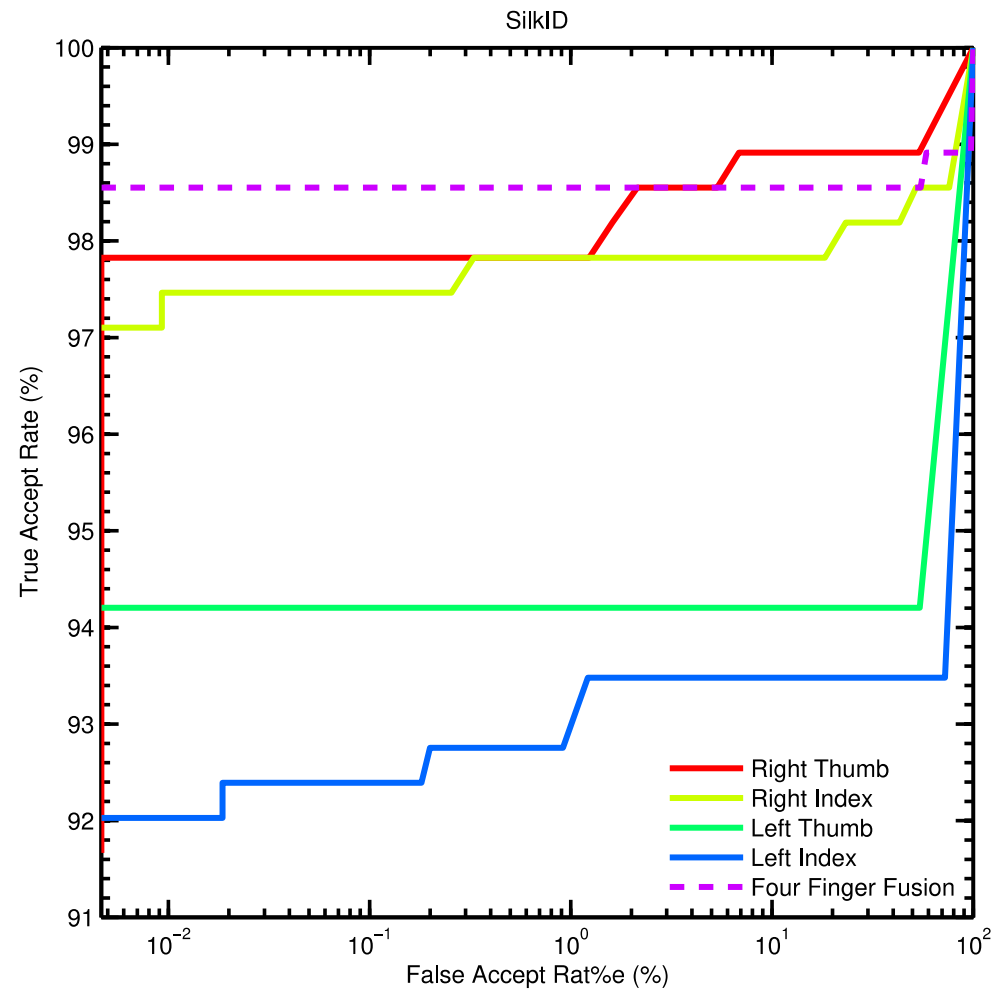


Henna

Images at a glance

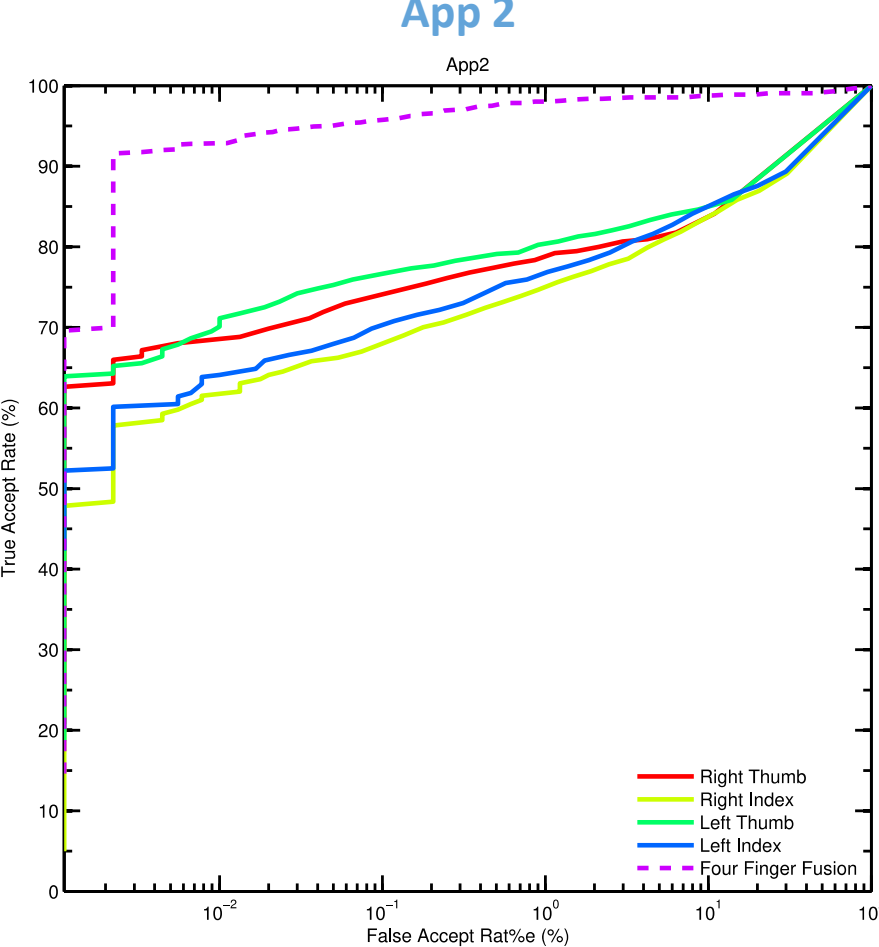
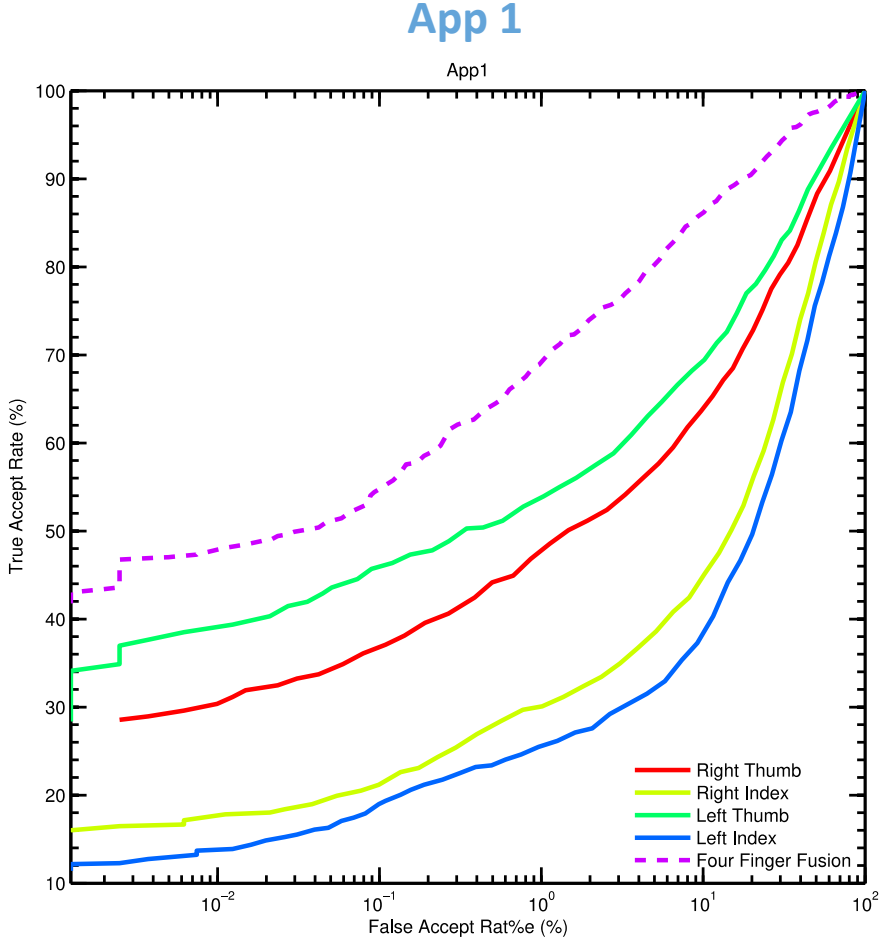


Hardware benchmark



These plots are for data of only 60 subjects

App ROC curves



Calculated in the full sample of 309

Target performance

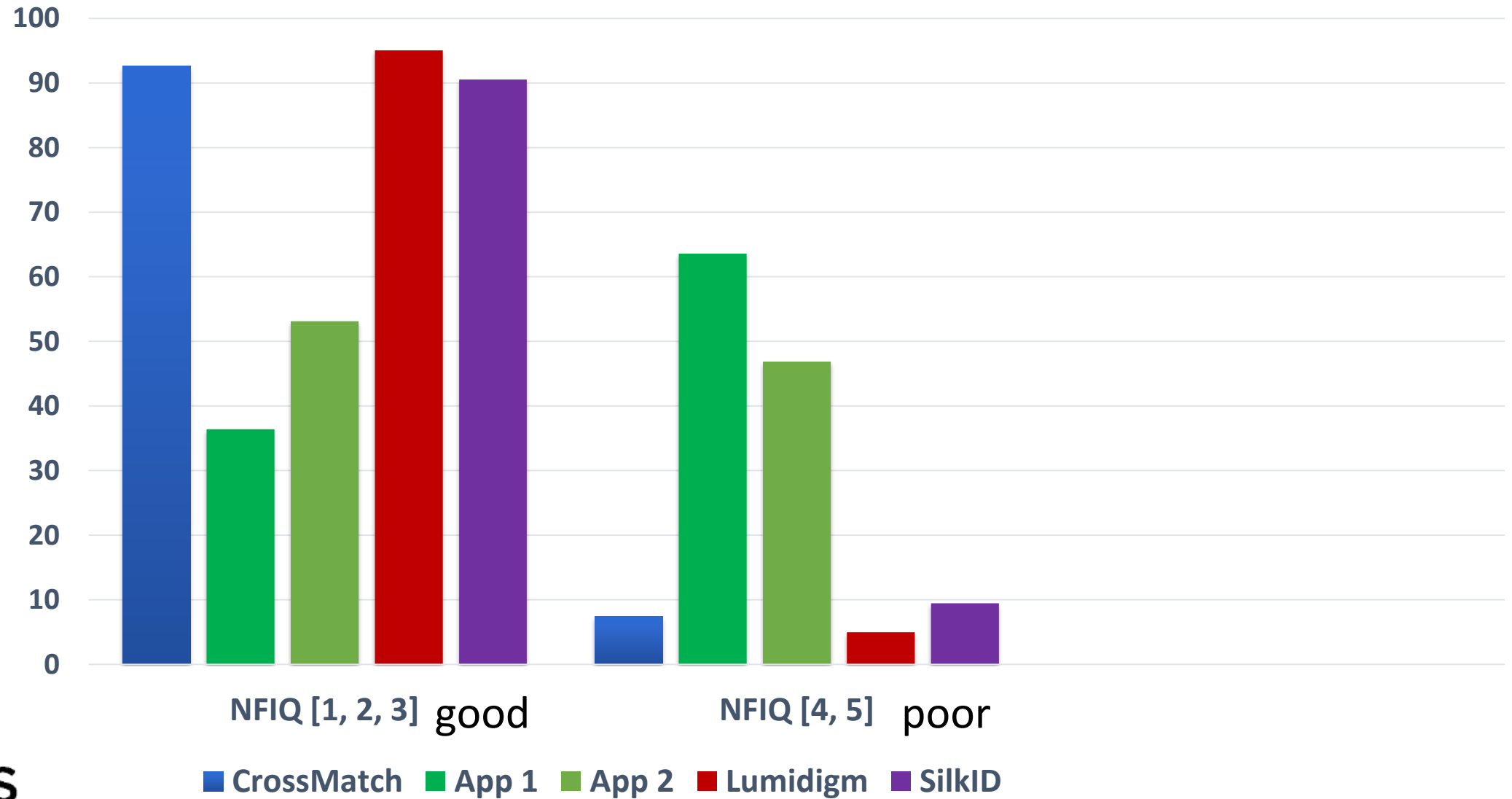
Target indicator:

False Accept Rate @ False Reject Rate of 2%

For four-finger fusion, the performance is

- App1: 56.2% FAR @FRR = 2%
- App2: 0.86% FAR @FRR = 2%
- SilkID: 0.00% FAR @FRR = 2%

Image quality was primary challenge



Biometrics – observations on the challenge

- **Difficult challenge** even for most contact-based
- **Technology seems to work** at a basic level
- **More development needed**, work in progress
- **Important technology**: perhaps opens very new financial inclusion models?

Thank
You

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