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Infant Biometric Identity:
A Mobile Deep Learning Approach

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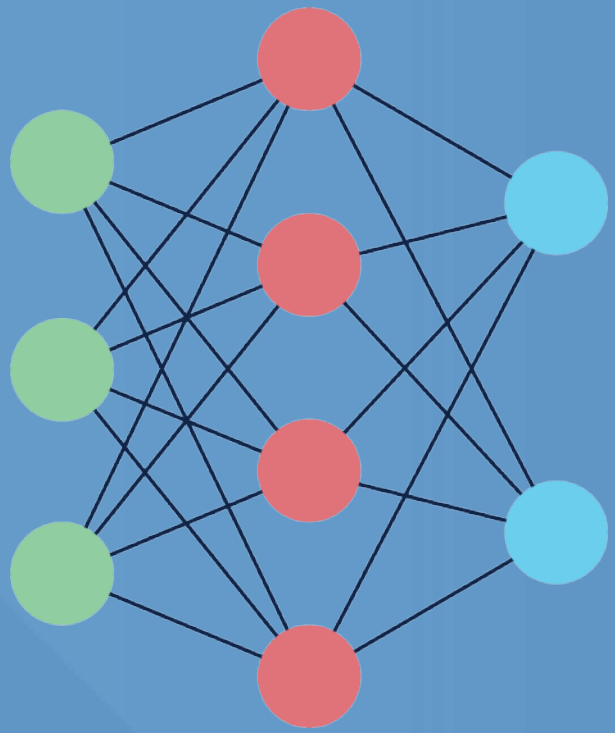
Deep Learning

A modern form of machine learning (artificial intelligence) in which models learn directly from data

Suited to address the unique challenges of scalable biometric recognition:

- ✓ Inclusive: Can be applied to unique (and multiple) human features
- ✓ Performance: Improvements in accuracy and robust over different conditions
- ✓ Security: Creates irreversible abstractions of data, providing native security architecture



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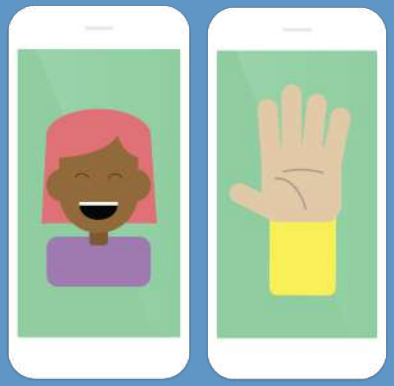
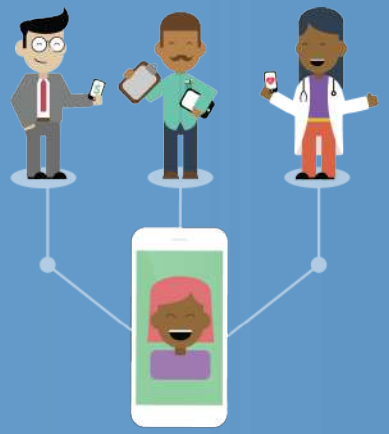
AI-Powered Mobile Software Solution





1. Capture image
2. Automated ID Chec
3. Biometric ID Create
4. Ecosystem Access

Uses existing camera on mobile devices - no specialized hardware

Works across devices

OCR technology to scan legal ID - enabling KYC / AML database checks

Deep Learning algorithms create a unique user ID

Without having to store PII/underlying images

Unique user ID can serve as cross-channel identity key for ecosystem access

Can be used without connectivity

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Infant Biometric Recognition

Challenges

- Small, rapidly-changing features hard to capture
- Last mile, low resource, low connectivity contexts
- Data security and privacy

Deep Learning Approach

- ✓ Can be deployed to recognize changes in features over time
- ✓ Application to modalities that can be captured with mobile cameras
- ✓ Native security architecture

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The BioNIC Initiative

A non-touch, globally scalable solution for infant biometric recognition

In partnership with

globalgood
Ideas by INTELLECTUAL VENTURES

Key Questions

- Are infant biometric modalities suitable for identification and verification?
- Do they have sufficient stability in infancy?
- Can they be captured on existing mobile devices, increasing the opportunity for use?

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Global Partners

Longitudinal collection of infant palm, ear, and foot biometric images

Cambodia

646,000 biometric images captured

5,000 infants and children enrolled

AHC
Improving Healthcare for Cambodia's Children

Bangladesh

972,500 biometric images captured

3,000 infants and children enrolled

icddr,b

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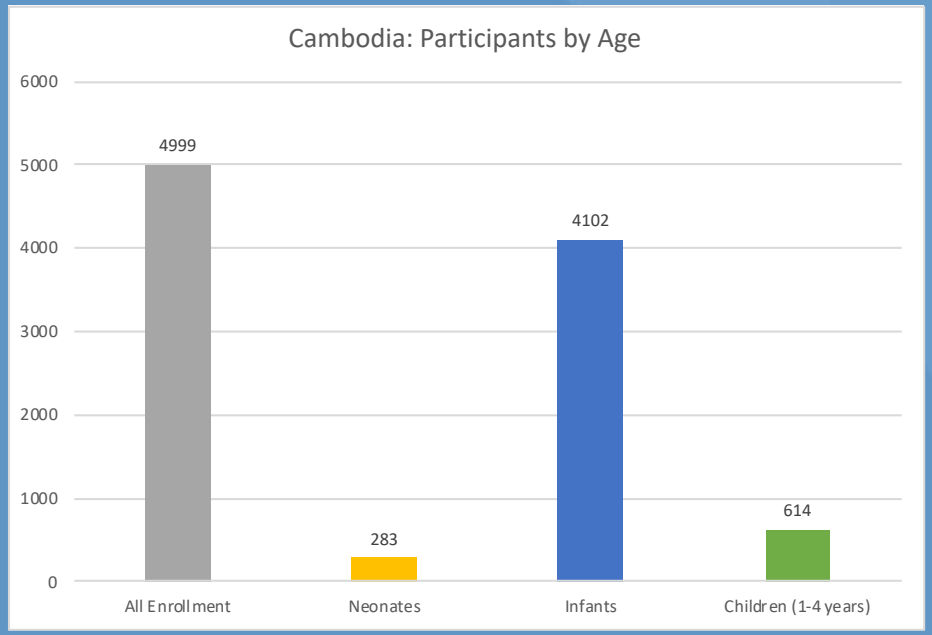
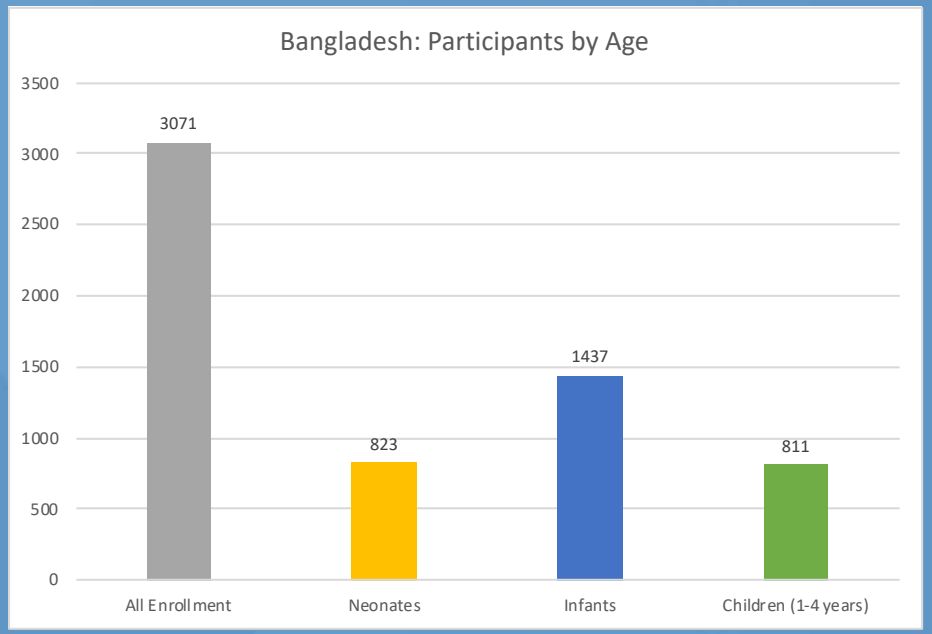
Real-World Dataset

World's largest infant biometric dataset





- Significant proportion of neonates
- Each child seen up to 3 times (6-8 weeks in between visits)
- Capture in real-world conditions

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Next Steps

Mozambique

Field validation **2,000** infants and children

Migration of models to mobile devices for offline verification

Focus on mitigating ethnicity bias

cism centro de investigação em saúde de manhiça

Gavi The Vaccine Alliance

2018 INFUSE Pacesetter

IBM Watson AI XPRIZE

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Unlocking Digital Ecosystem

Mobile biometric identity from birth to improve transparency and efficiency of service delivery

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Thank you!

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