

# Identification of Human Remains Through Innovation (Digital Fingerprint)



**GAUTENG**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA



**CSIR**  
Touching lives through innovation



**the cpsi**

Government Component:  
Centre for Public Service Innovation  
REPUBLIC OF SOUTH AFRICA



*“You can't change your fingerprints. You have only ten of them. And you leave them on everything you touch; they are definitely not a secret.”*

- AI FRANKEN -

# Questions:

**1: WHAT PERSON IS THE MOST IMPORTANT AT A FORENSIC MEDICAL LEGAL INSTITUTION?**

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**2: WHAT ASSET IS THE MOST IMPORTANT AT A FORENSIC MEDICAL LEGAL INSTITUTION?**

# Innovation, Where does it start?

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IT START WITH A STATEMENT  
THAT SAYS IT ALL !



GIVING A VOICE TO THE  
VOICELESS !!

# IDENTIFIERS

## Primary:

Skeletal profile  
Fingerprints  
DNA  
Dental

**Secondary:** Skull/ facial reconstruction  
Clothing  
Cell phone  
Documentation

Cell phone



ID document



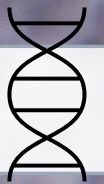
Fingerprints



Facial



DNA



# INTRODUCTION

How do we determine an individual's forensic identity?

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Is it your name, date of birth, hair colour or address?

**NO!**

A person's identity is the unique physical attributes:

- Skeletal features
- DNA profile
- Retina scan
- Facial features and
- Fingerprints



# PROBLEM ANALYSIS

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- Pretoria Mortuary (Gauteng), 2011
  - 7-10 % of their case load = Unidentified Human Remains (*Evert et al*)
- Salt River Mortuary (Western Cape), 2020
  - 9,2% of their case load = Unidentified Human Remains (*Reid et al*)
- In 2020 Gauteng Department of Health reported 1173 Unidentified Bodies in 11 Forensic Mortuaries
  - Germiston = 400
  - Pretoria = 117
  - Diepkloof = 103
- These Unidentified Remains are buried as “Paupers”, in various municipal areas



# Problem Statement

1: A large number of unidentified bodies buried as paupers- in Gauteng 2022-2023

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= 1700 per year at a cost of R 3000,00 per funeral= R 5 100 000,00

This is only at the Forensic Pathology service. Not even to speak about Hospitals

2: Exhumations done in Gauteng in 2022-2023

= 248 for 2022-2023 cost to family or claims against the state +- R 20 000,00 per exhumation

3: Long storage of bodies:

The long storage of bodies also becomes a health risk and increases costs to the department.



# Unidentified bodies in Gauteng: How the system works and plans to improve it

News & Features

4th May 2021 | Thabo Molelekwa

Democratic Alliance MPL Jack Bloom tells Spotlight these are all deaths that are thought to be due to unnatural causes, which is why they end up in a state mortuary.

“If they don’t have any form of identification on them, it is difficult to contact the family. Many of these bodies are probably foreigners with no local family. Tragically, in some cases the body is identified but is unclaimed because the family cannot afford to bury them,” says Bloom, adding that the government tries not to keep bodies for more than 30 days as they may run out of capacity and space.



*There are 472 unidentified bodies say Forensic Pathology Services in theCape. Picture: Boxer Ngwenya*

## There are 472 unclaimed bodies at mortuaries around the Cape

By Shanice Naidoo 🕒 Sep 18, 2021

# SOUTH AFRICAN LEGISLATION

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- Constitution of South Africa: Bill of Rights
- Statutes
  - Inquests Act 1959
  - The Births and Deaths Registration Act 51 of 1992
  - Identification Act 68 of 1997
- Regulations of the National Health Act,
  - Regulations Regarding the Rendering of Forensic Pathology Services
  - Regulations Relating to the Management of Human Remains
- National Code of Guidelines
- Memorandum of Understanding between SAPS and FPS

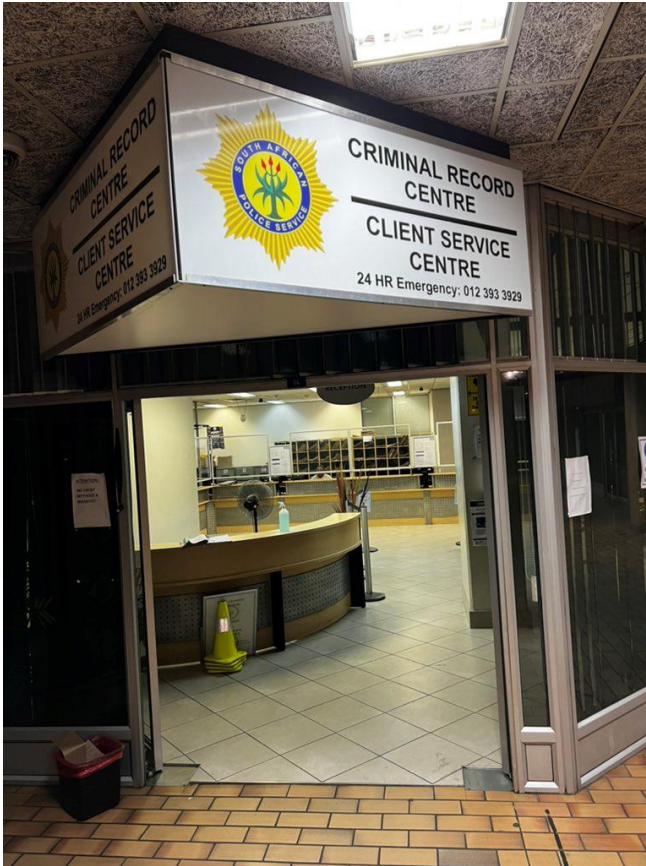
# CURRENT PRACTICE IN IDENTIFICATION OF DECEASED IN FPS, SOUTH AFRICA

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1. Statement from family or Next of Kin
  - ID of deceased or word of mouth (Affidavit)
2. Taking and collecting of Fingerprints from unknown deceased
3. Collecting of DNA for burnt, decomposed, dismembered or skeletonized
4. Facial reconstruction on human skull

# CURRENT FINGERPRINT PROCESS

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- FPS takes Fingerprints and sends it for Identification to the Local Criminal Record Centre (LCRC)
  - Can take min of 40 days
- Home Affairs has a database of all South African Citizens
  - Biometrics of all decedents should be verified with this database to prevent fraud
  - Identification of unidentified remains

# FINGERPRINTS AS A PRIMARY IDENTIFIERS IN SOUTH AFRICA

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Department of Home Affairs













- One of the countries with a centralised population register
- Containing Fingerprints and photo

SAPS Automated Fingerprint Identification System (AFIS) Database

- Criminal Fingerprint records



# CURRENT PRACTICE IN COLLECTING OF FINGERPRINT IN GAUTENG FPS

Reason for enquiry				
 LEFT THUMB	 RIGHT THUMB			
Fold				
Thumb	Forefinger	Middle finger	Ring finger	Little finger
 RIGHT HAND	2 	3 	4 	5  RIGHT HAND
Fold				
6  LEFT HAND	7 	8 	9 	10  LEFT HAND
Fold				

and submitted at the Department of Home Affairs office by the informant or authorised funeral undertaker.  
Fields are **COMPULSORY**. Incomplete applications and applications that are not legible may be considered invalid.  
Note: The fingerprints of the deceased, the informant and the undertaker must be taken by the undertaker)

**PARTICULARS OF THE DECEASED**

Instructions: Section A to be filled out by **Authorised Medical Practitioner / Professional Nurse**, who is responsible for examining the body to determine the cause of death.  
Informant must verify, and where necessary, complete in full the personal particulars and other information of the deceased below.

Is this a death or a stillbirth? ☐ 1.1 Death ☐ 1.2 Stillbirth

Identification of the deceased (tick one box):

2.1 The deceased was identified with an ID document / passport (if foreigner) produced by the family

2.2 Stillborn child

2.3 The features of the deceased do not seem to match the features on the ID document or passport of deceased

2.4 ID document or passport of the deceased was not presented. The deceased was identified through word of mouth

2.5 The deceased was already buried prior to the completion of this form

2.6 The deceased was unidentifiable: ☐ 2.6.1 Burnt ☐ 2.6.2 Decomposed ☐ 2.6.3 Other (specify) \_\_\_\_\_

☐ 2.6.4 DNA samples retrieved for identification purposes ☐ 2.6.5 Dental records taken for identification purposes


Place of Death / stillbirth 2021/01/13


Place of Death/stillbirth (City/Town/Village) Melipham Hospital

Province of Death/stillbirth Gauteng

Place of Registration of Death / stillbirth

Death occurred within 24 hours of death

  
Left thumbprint of deceased

  
Right thumbprint of deceased





LEFT THUMB

Fold

Reason for inquiry:

.....

.....

.....

.....

RIGHT THUMB



Thumb

Forefinger

Middle finger

Ring finger

Little finger

RIGHT HAND



2



3



4



5



RIGHT HAND

Fold

6



LEFT HAND

7



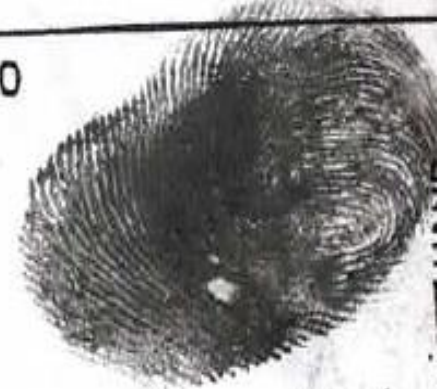
8



9



10



Fold

fingers taken simultaneously



[Births and Deaths Registration Act 51 of 1992]

[Regulations 11 and 14]

1663G487433

**NOTICE OF DEATH / STILLBIRTH**  
[Births and Deaths Registration Act 51 of 1992]  
[Regulations 11 and 14]

To be completed in full and submitted at the Department of Home Affairs office by the informant or authorised funeral undertaker.  
The form to be completed in **BLACK INK** with **BLOCK LETTERS**. Please mark with ☒ the **CORRECT** box, where required.  
**All fields are COMPULSORY. Incomplete applications and applications that are not legible may be considered invalid.**  
(Note: The fingerprints of the deceased, the informant and the undertaker must be taken by the undertaker)

**A. PARTICULARS OF THE DECEASED**

Instructions: Section 51(1) of the Births and Deaths Registration Act 51 of 1992 requires that the informant must provide the following information to the Registrar of Births and Deaths:

**A. PARTICULARS OF THE DECEASED**  
Instructions: Section A to be filled by the Informant.  
The Informant

**INSTRUCTIONS OF THE DECEASED**

Instructions: Section A to be filled out by **Authorised Medical Practitioner / Professional Nurse**, who is responsible for examining the body to determine the cause of death.

The Informant must verify, and where necessary, complete in full the personal particulars and other information of the deceased below.

1. Was this a death or a stillbirth?

2. Identification

1. Was this a death or a stillbirth? ☐ 1.1 Death ☐ 1.2 Stillbirth

2. Identification of the deceased (tick one box): ☐ 1.1
- ☐ 2.1 The deceased

- 2.1 The deceased was identified with an ID document / passport (if foreigner) produced by the family
- 2.2 Stillborn child

- 2.2 Stillborn child

- ☐ 2.3 The features of the deceased do not seem to match the features on the ID document or passport of deceased
- ☐ 2.4 ID document or passport

- 2.4 ID document or passport of the deceased was not presented. The deceased was identified through word of mouth

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- ☐ 2.6.1 Burnt ☐ 2.6.2 Decomposed ☐ 2.6.3 Other (specify)

- ☐ 2.6.4 DNA samples retrieved for identification purposes ☐ 2.6.5 Dental records taken for identification purposes

3. Date of Death / stillbirth

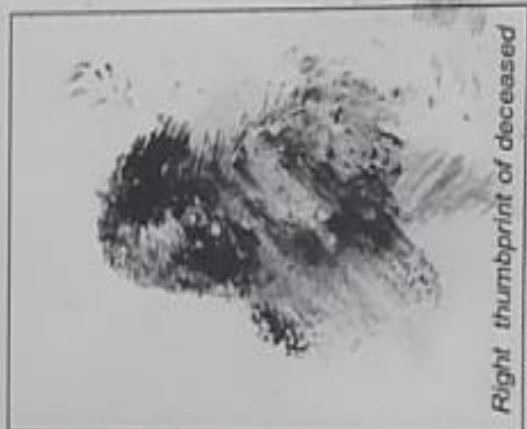
- 4.1 Place of Death/stillbirth (City/Town/Village)

- #### 4.2 Province of Death/stillbirth



5. Place of Registration of Death / stillbirth





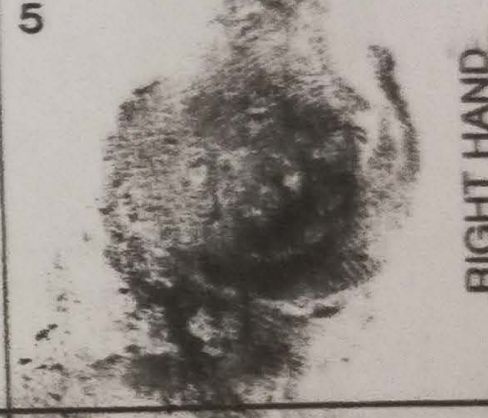



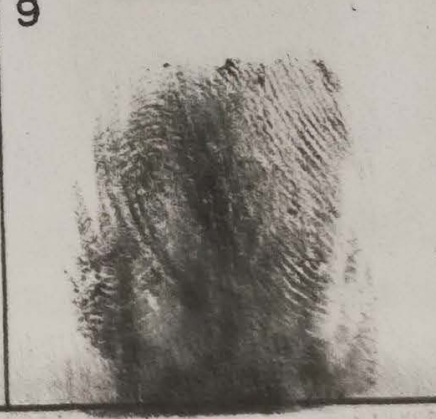

6. If death occurred within 24 hours after birth, number of hours alive

7. Home telephone no. \_\_\_\_\_




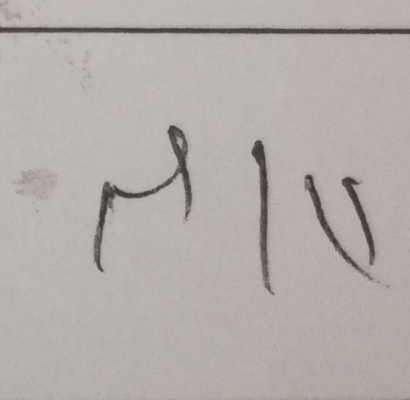


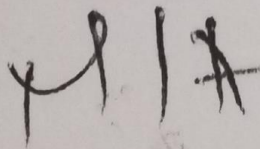
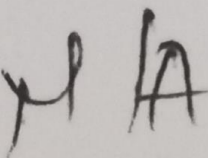
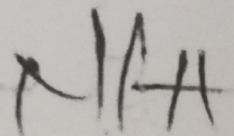
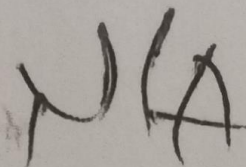
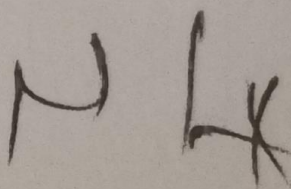





 <p style="writing-mode: vertical-rl; transform: rotate(180deg);">LEFT THUMB</p> <p>Fold</p>	<p><i>Reason for enquiry:</i></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">RIGHT THUMB</p> 
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Thumb	Forefinger	Middle finger	Ring finger	Little finger
<p>1</p>  <p style="writing-mode: vertical-rl; transform: rotate(180deg);">RIGHT HAND</p> <p>Fold</p>	<p>2</p> 	<p>3</p> 	<p>4</p> 	<p>5</p>  <p style="writing-mode: vertical-rl; transform: rotate(180deg);">RIGHT HAND</p>
<p>6</p>  <p style="writing-mode: vertical-rl; transform: rotate(180deg);">LEFT HAND</p> <p>Fold</p>	<p>7</p> 	<p>8</p> 	<p>9</p> 	<p>10</p>  <p style="writing-mode: vertical-rl; transform: rotate(180deg);">LEFT HAND</p>

Right hand (Plain impressions of four fingers taken simultaneously)



	LEFT THUMB	Reason for enquiry:		RIGHT THUMB 
		.....		
		.....		
		.....		
		.....		

Thumb		Forefinger		Middle finger		Ring finger		Little finger	
1		2		3		4		5	
RIGHT HAND								RIGHT HAND	
									
Fold									
6		7		8		9		10	
LEFT HAND								LEFT HAND	
									
Fold									

Left hand (Plain impressions of four fingers taken simultaneously)	Right hand (Plain impressions of four fingers taken simultaneously)
--	---



# WHY IS THE QUALITY OF OUR FINGERPRINTS SO BAD?

- Forensic Pathology service don't understand the importance of Quality fingerprints collection as an identifier
- Not having the right tools of trade that is job specific for taking fingerprints from deceased
- Forensic officers don't take pride in their work, and they think that they don't have an impact on the justice system



# HOW TO IMPROVE THE COLLECTING OF FINGERPRINTS

- Training
  - Importance of Fingerprints as an identifier
  - how to take good visible prints.
  - New improved techniques
- Procurement of right equipment

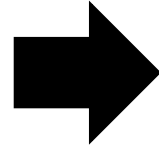


# HOW TO IMPROVE THE COLLECTION OF QUALITY FINGERPRINTS AT FPS

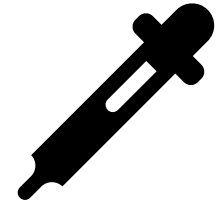
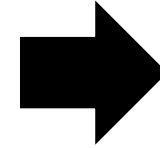
With the basic equipment: think out of the box



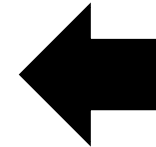
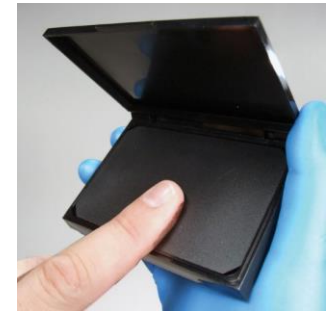
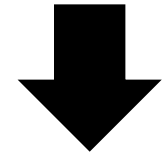
Wash the hands and prints



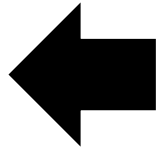
Dry print from excess water with cloth from disposable gown



If the skin of the print is dry take a syringe and needle with water and rehydrate



Use match box or stable back plate  
Lightly press finger on paper to make  
ink fingerprint impression



10. L. LITTLE		9. L. RING		8. L. MIDDLE		7. L. INDEX		6. L. THUMB	
NAME (LAST)		(FIRST)		(MIDDLE)		DOB (MM/YY)		SEX	
								CITIZENSHIP	
								HEIGHT	
								WEIGHT	
								EYES	
								HAIR	
1. R. THUMB		2. R. INDEX		3. R. MIDDLE		4. R. RING		5. R. LITTLE	

Prepare paper for Print impression

Ink the fingerprints lightly with inkpad





IMPROVEMENT/INNOVATION

# SOLVING PROBLEMS OF THE DEAD TO IMPROVE THE LIVE OF THE LIVING

Private:  
Reduce insurance fraud



Public service:  
Reduce claims against  
the Health sector

Public:  
Improve service  
delivery to clients

Justice:  
By identify the victim  
most of the time lead to  
the suspect.  
Justice delayed is justice  
denied

# NEW TECHNOLOGY IN COLLECTING DECEASED FINGERPRINTS

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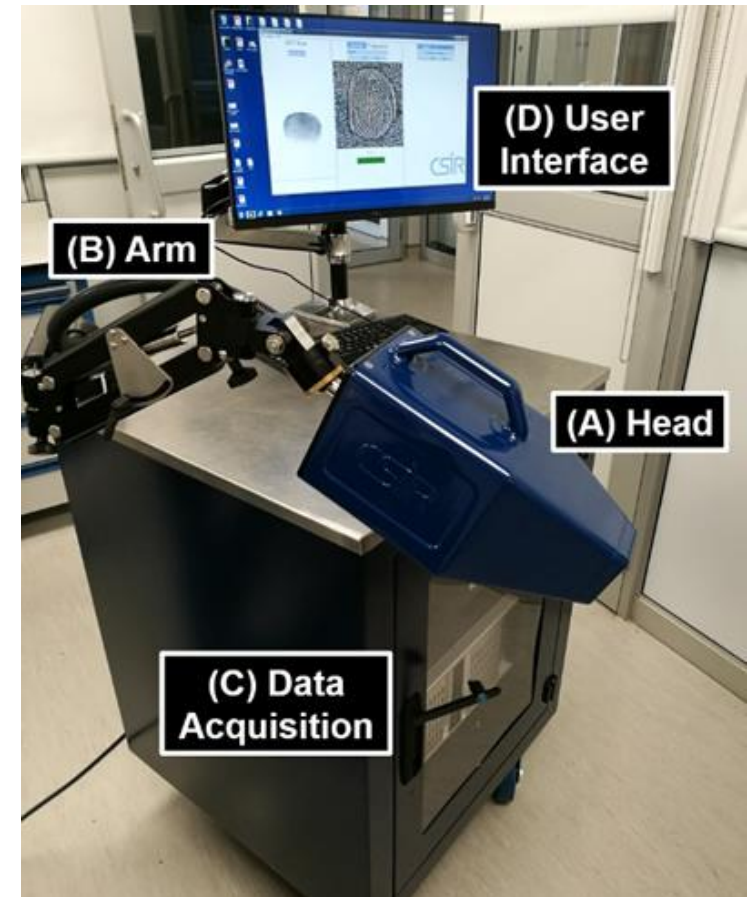
- 4<sup>TH</sup> Industrial Revolution
  - Fingerprint scanners
  - Laser scanners
  - Verification Software



# Nr 1: OPTICAL COHERENCE TOMOGRAPHY (OCT)

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- Capturing fingerprints with laser imaging
  - We can capture the print without touching a surface
  - The images are then captured onto an SAPS 91A form
- Pros
  - Assists with capturing hard to collect fingerprints
  - Touchless = Less contamination
- Cons
  - Expensive
  - Hard to work with
  - Requires multiple people





# OCT PRINT QUALITY



Fold		LEFT THUMB			<i>Reason for enquiry:</i> UNKNOWN DECOMPOSED BLACK MALE ..... CONTACT W D FOUCHE ..... WILHELM.FOUCHE@GAUTENG.GOV.ZA..... 0824594659 ..... .....					RIGHT THUMB		
		Thumb		Forefinger		Middle finger		Ring finger		Little finger		
Fold		1 RIGHT HAND 		2 		3 		4 		5  RIGHT HAND		

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Warning this Presentation may  
contain sensitive visual content !!



# REAL TIME ELECTRONIC BIOMETRIC FINGERPRINT VERIFICATION:

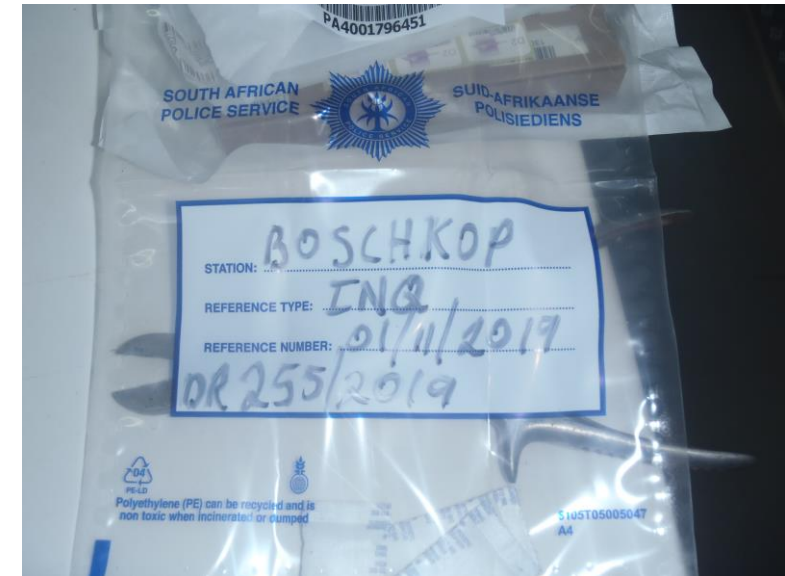
- Quick assistance ( Body parts )
- Internet : VerifyID 3 Party KYC
- We can capture left and right thumb print of a deceased with a biometric scanner.
- Then verify it directly with information on ABIS / HANIS
- Receive a verification with in 1-2 Min
- **Real Change in scientific Identification**

















# From OCT to normal Scanner and verification 2019

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# Biometrics scanners

 LEFT THUMB		Reason for enquiry: TEST SUPREMA TEST 2			RIGHT THUMB 
Fold					
Thumb		Forefinger	Middle finger	Ring finger	Little finger
1 RIGHT HAND Fold 	2 	3 	4 	5  RIGHT HAND	
6 LEFT HAND x 1 in 	7 	8 	9 	10  LEFT HAND	

# MISSING ADULT ALERT

072 MISSING EMERGENCY NUMBER 072 647 7464



**DEBBIE VENTER (52)**

**29 MAY 2020 • GAUTENG**

Debbie was last seen at the BP garage in Simon Vermooten Road, Silverton. She is driving a white Ford Escort, registration number DD1HMGP.

#### DESCRIPTION

**HAIR:** Brown | **EYES:** Brown | **WEIGHT:** 42kg | **HEIGHT:** 1.54m

She was last seen wearing a black hoodie top with green pajamas.

ANYONE WITH INFORMATION, PLEASE CALL THE FOLLOWING NUMBERS:

**BROKHORSTSPRUIT SAPS:** 013 932 9222 | **W/O TOSEN:** 071 612 1937

**MISSING CHILDREN SA:** 072 647 7464

Join the fight today and assist MCSA in bringing children home safely.

**GO TO:** [www.missingchildren.org.za](http://www.missingchildren.org.za)

**and click on the DONATE button.**

## CASE STUDY 1

- Person was reported missing by Family member
- All statements?
- SAPS Bronkhorstspuit

Parameter	RSA ID Number
Search Type	VerifyID BioMetric ID Verification
Search Date	2020-07-07 10:14:00
ID Number Verification	Home Affairs Verified
Photo Verification	Photo Found
Finger Print Verification	Fingerprints Match with ID Number



Left Thumb



Right Thumb

ID Number	6805240012084
Registered Names	DEBBIE
Surname	VENTER
Date of Birth	1968-05-24
Gender	Unknown
Dead/Alive	Alive

Search Date	2021-09-13 11:04:31
ID Number Verification	Home Affairs Verified
Photo Verification	Photo Found
Finger Print Verification	Fingerprints Match with ID



Left Thumb

Right Thumb

ID Number	5010125695084
Registered Names	MATHOLWANE
Surname	CHABANGU

# Impact of using Digital Biometrics

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- 1: Reduce the time of identification. “Justice delayed is justice denied”
- 2: Improved the quality collection of the primary identifier like fingerprints
- 3: Strengthen the scientific identification of the deceased.
- 4: Improve staff morale and ethics.
- 5: Doing the basics right on a day-to-day identification positively impacts handling mass fatality incidents.



# The ripple effect of taking identification to the next level

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- 1: February 2022 Center for public service innovation (CPSI) 1<sup>st</sup> runner up  
(putting Forensic Pathology on the Map)
- 2: July 2022 Western Cape 4 Change ( W4C) Training undertakers and FPOs on fingerprint  
(The first connection between Forensic Officers since 2006) also WITS/ ICRC  
Human Decedent Identification Workshop
- 3: January 2023 CPSI replication project: taking it to 5 facilities in Gauteng and also to the  
province of Limpopo.
- 4: March 2023: ASFM Kigali: Improving the identification of human remains
- 5: June 2023: 3<sup>rd</sup> DNA Symposium: DNA HIT of the Year ( Lina Mattati )

# Enroll Project For 2021 CPSI

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- 1: For Harnessing technology to improve service.  
September 2021  
E Ivey !



**CALL FOR ENTRIES**

## 19TH PUBLIC SECTOR INNOVATION AWARDS 2021

The Centre for Public Service Innovation invites innovators in government departments, public entities, municipalities, public institutions and partners to enter their service delivery innovations.

Forms available: [www.cpsi.co.za](http://www.cpsi.co.za)

**DEADLINE: 17 September 2021**

 **the cpsi**  
Government Component  
Centre for Public Service Innovation  
REPUBLIC OF SOUTH AFRICA



# Runner up 2<sup>nd</sup> place at 19<sup>th</sup> CPSI AWARDS

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. February 2022  
For Gauteng Province



# Public service innovation award

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# Nominated For Replication

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the cpsi

Government Component:  
Centre for Public Service Innovation  
REPUBLIC OF SOUTH AFRICA



May 2022 The Center For public service innovation (CPSI) nominated the project to be replicated

## Digital Fingerprint Forensic Pathology Gauteng Replication

### 20<sup>th</sup> October 2022

Venue: Forensic Pathology Service Pretoria  
10 DR Savage Road Riviera Pretoria 0084

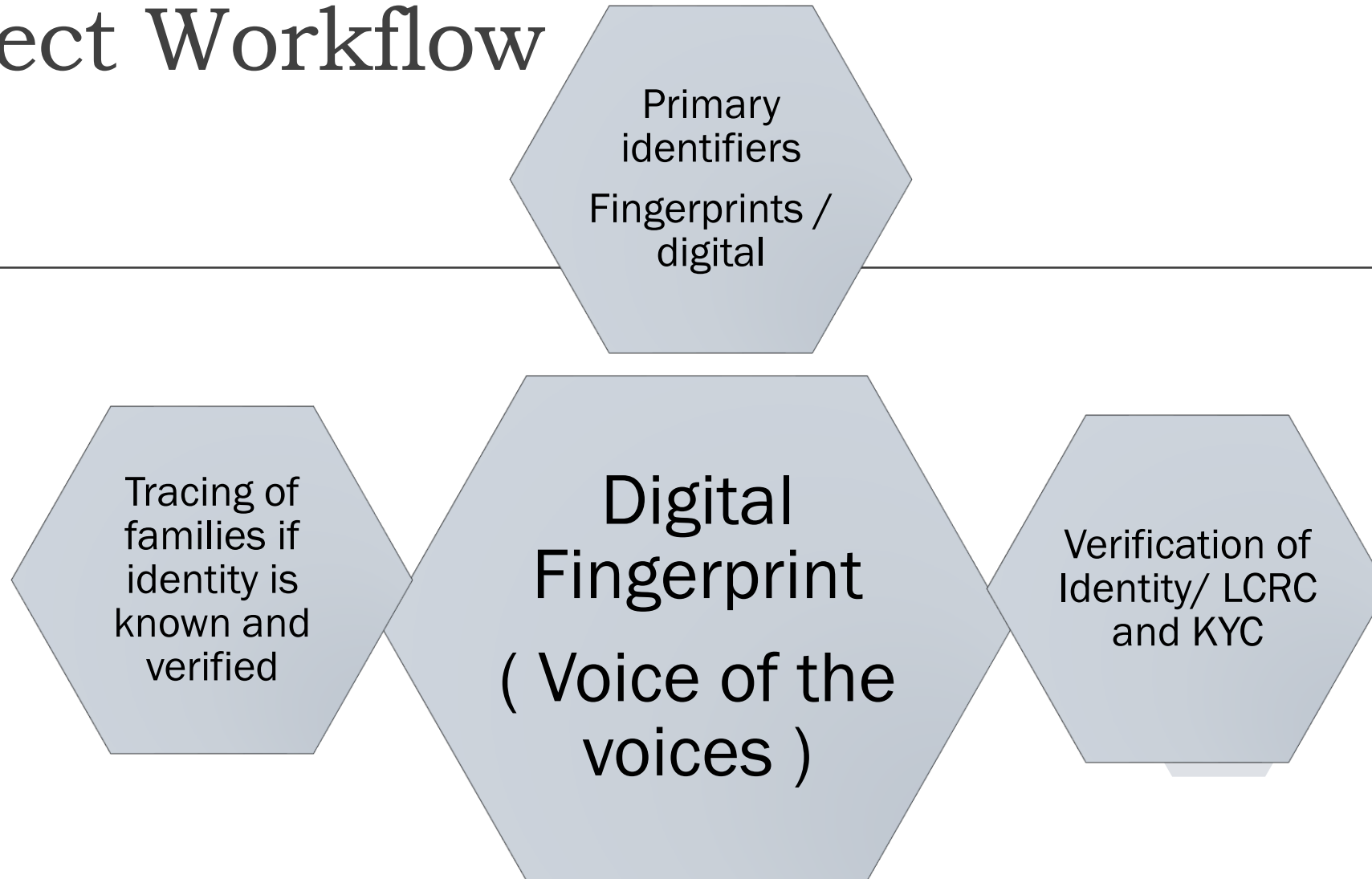
**GPS Coordinates:** S25 44 04 E28 11 58 | [///junction.law.honest](http://junction.law.honest)  
09:00-15:00



# Training cheering knowledge



# Project Workflow







The Western Cape Cold Case Consortium (W4C) in partnership with the CHEC-City of Cape Town Regional Development Fund and Forensic Pathology Services Western Cape & Gauteng are proud to present

## IMPROVING POST-MORTEM IDENTIFICATION IN CAPE TOWN AND THE WESTERN CAPE

You are invited to join a knowledge-sharing and practical workshop session focusing on improving post-mortem identification. These sessions are open to both medico-legal and City of Cape Town service providers.

Facilitated by expert forensic practitioners working across FPS and academic environments, we take a holistic view of post-mortem identification in the context of current South African legislation and local innovation.

We focus on an integrated understanding of the role of fingerprinting and photography as complementary biometric and visual identification methods.

No registration fees. Lunch and refreshments will be provided. Participants will receive a Certificate of Attendance.

**RSVP no later than FRIDAY 8 JULY by completing this Google Form**

**WHEN TUES 12 JULY\* OR WED 13 JULY\*\***

\* for City service providers (non-forensic mortuaries/undertakers)  
\*\* for FPS members/officers only

**TIME 08h00 – 16h00**

**VENUE UNIVERSITY OF CAPE TOWN  
ANATOMY MUSEUM AND PAM LAB  
ANZIO ROAD  
OBSERVATORY, CAPE TOWN**

Directions, parking information & any further information will sent with confirmation of registration

Please address any queries to Dr Kathryn Smith  
[kathryns@sun.ac.za](mailto:kathryns@sun.ac.za)



**ICRC**



Human Decedent  
Identification Workshop  
04-08 July 2022

Program & Presenter  
Biographies

Division of Forensic Medicine and  
Pathology, University of the Witwatersrand  
(University of the Witwatersrand)

&

International Committee of the Red Cross



# Gauteng launches digital fingerprint system to fast track identification of unclaimed bodies

Yoliswa Sobuwa

**news24**



Comments



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0:00



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# Answer

1: WHAT PERSON AT FPS IS THE MOST IMPORTANT?

THE DECEASED!!!!

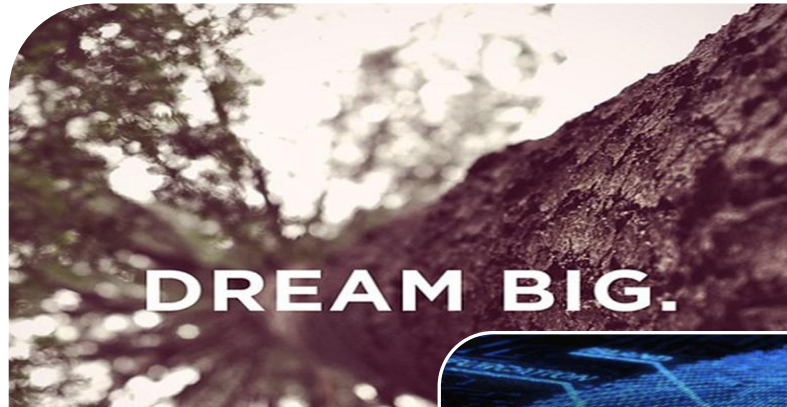
2: WHAT IS THE MOST CRITICAL ASSET AT FPS?

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HUMAN ASSET !!!!

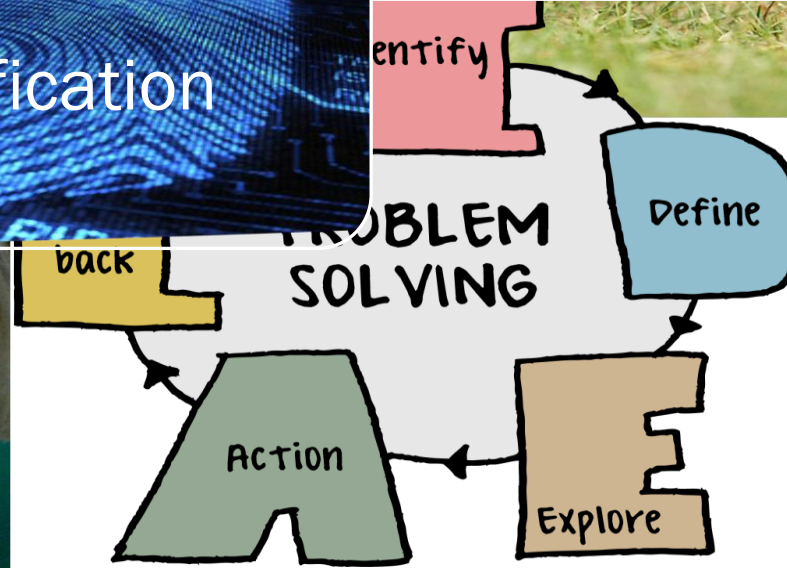
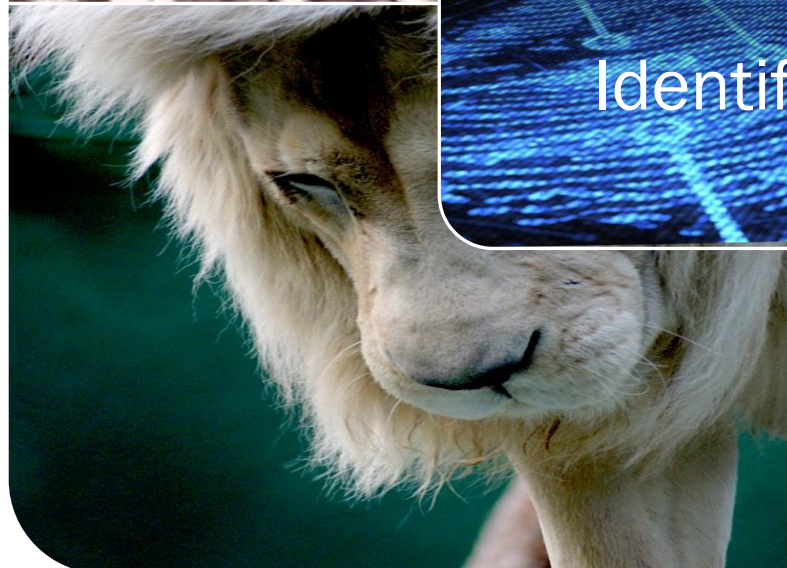
# Closing statements

Dream big :



Put yourself in the shoe of other

Stay humble :



Do the basics right

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## Contact Information

Rehabilité Khutlang

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