

Machine Learning for Cyber Security

Part 2

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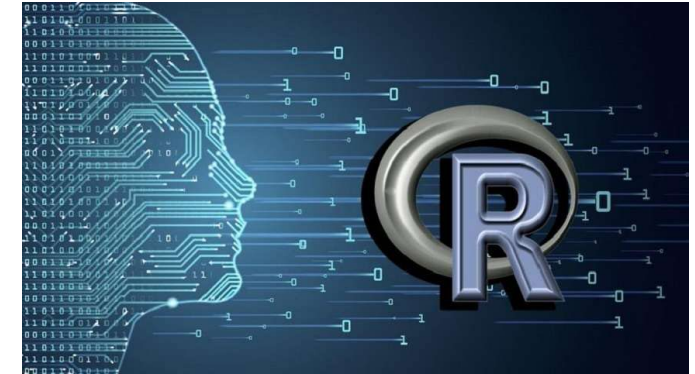
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Today's Activities (depending on time & interest)

1. Password generation and cracking in Python
2. Malware Infection in Python
3. Bayesian poisoning in R
4. Biometrics
 - a. Face detection in Python
 - b. Fingerprint matching in Python
5. Image classification using CNNs in Python



Data



Sorted



Arranged



Presented
Visually



Explained
With A Story



Actionable
(Useful)



Ignored By
Management
And Tossed
Out



1. Password Generation and Cracking

https://colab.research.google.com/drive/1sLa1N09ul_RFLt0_ypAPUPZjMc_zNiR-?usp=sharing

2. Malware Infection

<https://colab.research.google.com/drive/1hXy9srPhVN9B7D2lrjZX9ltnemVrDPVz?usp=sharing>

3. Bayesian Poisoning

https://colab.research.google.com/drive/1_6XFtMo0N63e3ULdsDCTZbPMKzB6MiPE?usp=sharing

4. Biometrics

More Info:

<https://www.biometricupdate.com/201802/history-of-biometrics-2>

Bertillonage

(L. Brown)

Height	1m 79.6	Head l'gth	19.8	L. Foot	27.1	Circle	leh	Age	22	Born in	
Eng. H'ght	5-10 3/4	Head width	16.3	L. Mid. F.	11.2	Periph Z		Apparent Age			
Outs. A	1 m 75.5	Cheek width	14.4	L. Lit. F.	8.7	leh-Mel		Nativity	Louisville, Ky.		
Trunk	94.9	R. Ear	6.8	L. Fore A.	46.6	Pecul		Occupation	showman		

Remarks Incident to Measurement {



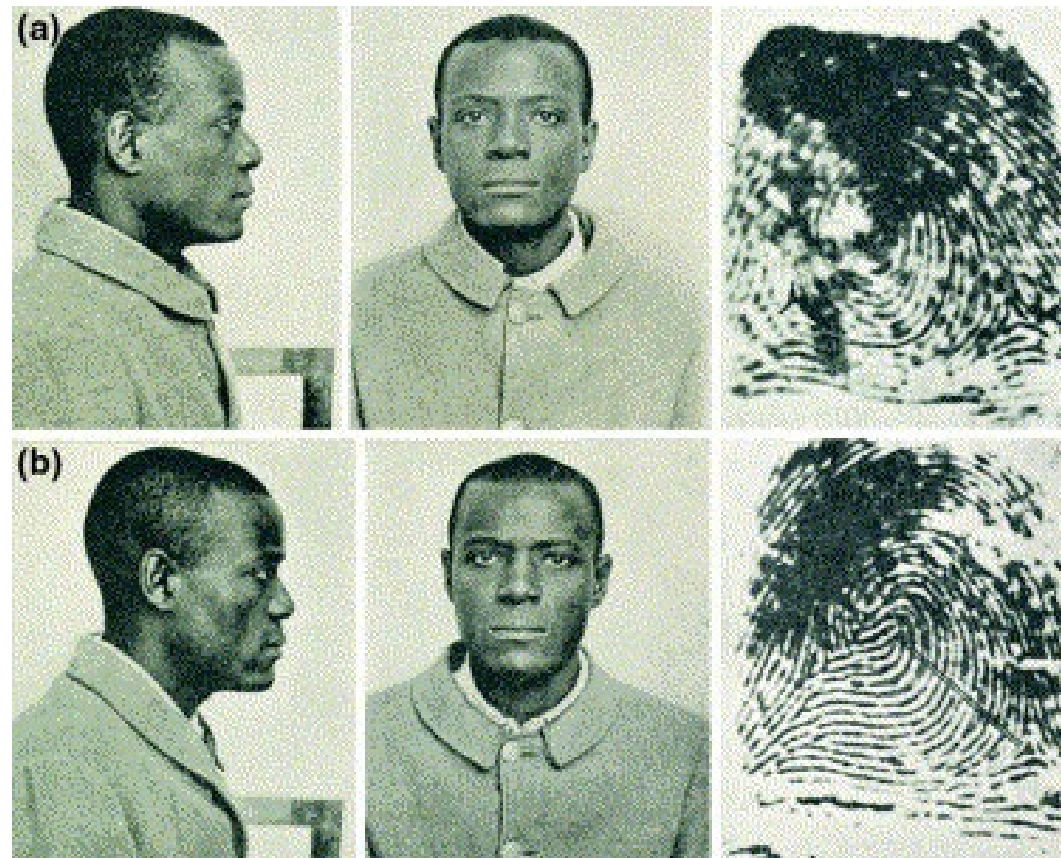
DESCRIPTIVE

Forehead	Incl.	Recd	NOSE	Ridge	Vex	R. Ear	Beard	Shaved	
	Height	M		Base	(Eu) Root		Hair	Black	
	Width	Brd		DIMENSIONS			Complexion	M. Dark	
	Pecul			Length	Projection		Breadth	Teeth	Upper front overlap
							Weight	165	
							Build	M. Slim	

BUREAU OF IDENTIFICATION
Department of Police,
Tulane Ave. and Saratoga St.
New Orleans, La.

Measured Feb 1 1913
By Geo. B. Harris

The Will and William West case



<https://caasbrey.com/a-fingerprint-fable-the-will-and-william-west-case/>

Fundamentals

- Everything examined with enough detail can be distinguishable
- Humans have patterns that help secure systems (5 factors of authentication):
 - What you know
 - A password
 - What you have
 - Physical key
 - Where you are
 - Location
 - What you are
 - Biometrics
 - How you are
 - Behaviours (e.g. gait, handwriting, etc.)

4a. Fingerprint Matching

<https://colab.research.google.com/drive/15mtlfOwuYygEwP9fpA1PMYJToUsnkKlh?usp=sharing>

4b. Face detection

https://colab.research.google.com/drive/1qpk_hozXly_JTS4qarB6msGUuRdb-iVq?usp=sharing

5. Image Classification using Neural Networks

https://colab.research.google.com/drive/1p_r_buzwt0FBGEkVE1E91FKFrAIPDSZL?usp=sharing

Final Considerations
