ROBERT GORDON UNIVERSITY ABERDEEN

Machine Learning for Cyber Security Part 2

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Today's Activities

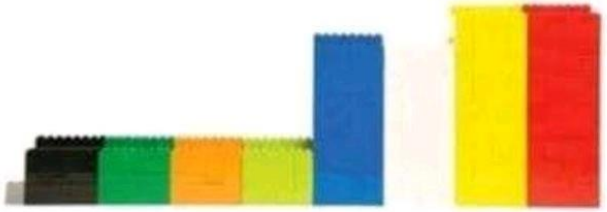
1. Password generation and cracking in Python
2. Malware Infection in Python
3. Bayesian poisoning in R
4. Biometrics
   a. Face detection in Python
   b. Fingerprint matching in Python
5. Image classification using CNNs in Python

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

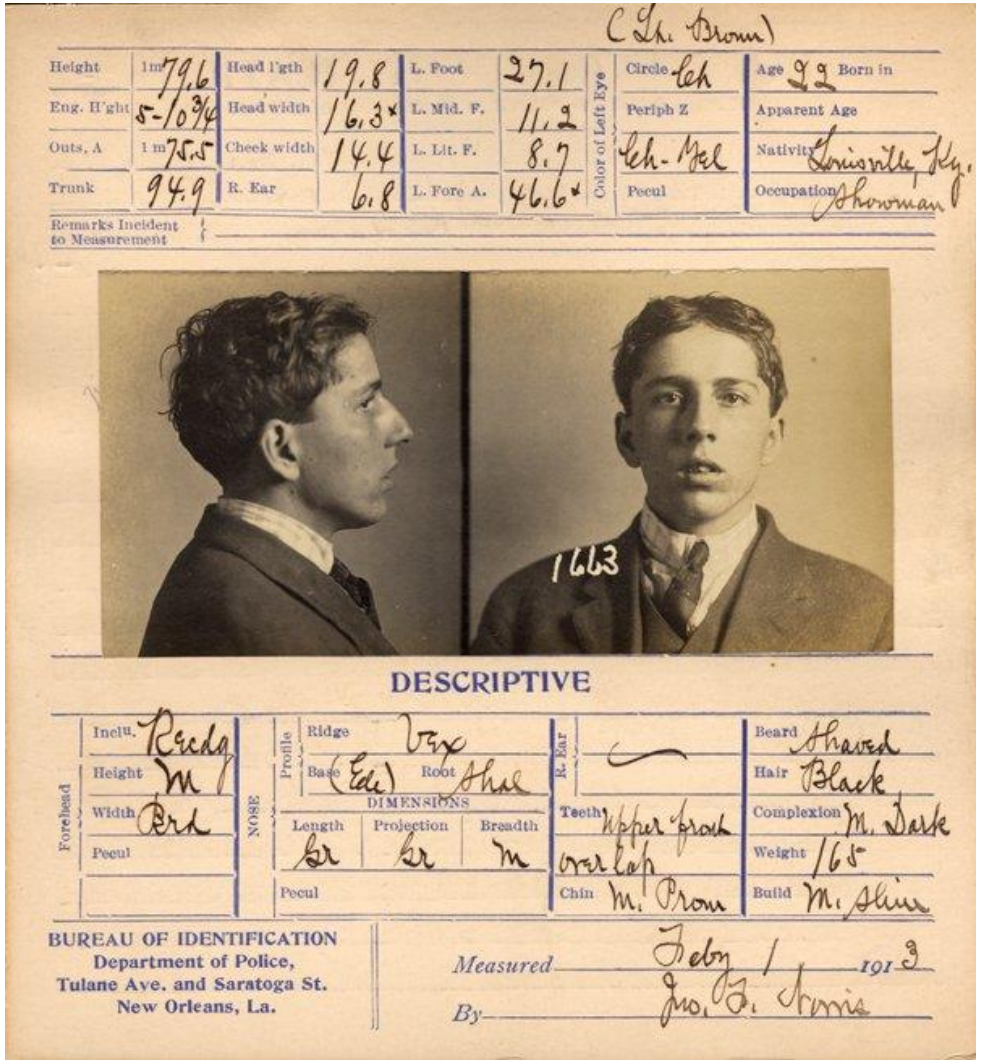
https://colab.research.google.com/drive/1UmTx0h-Tc6Prn9FQ1bjl-Zwbz9cq2lOK?usp=sharing

4. Biometrics

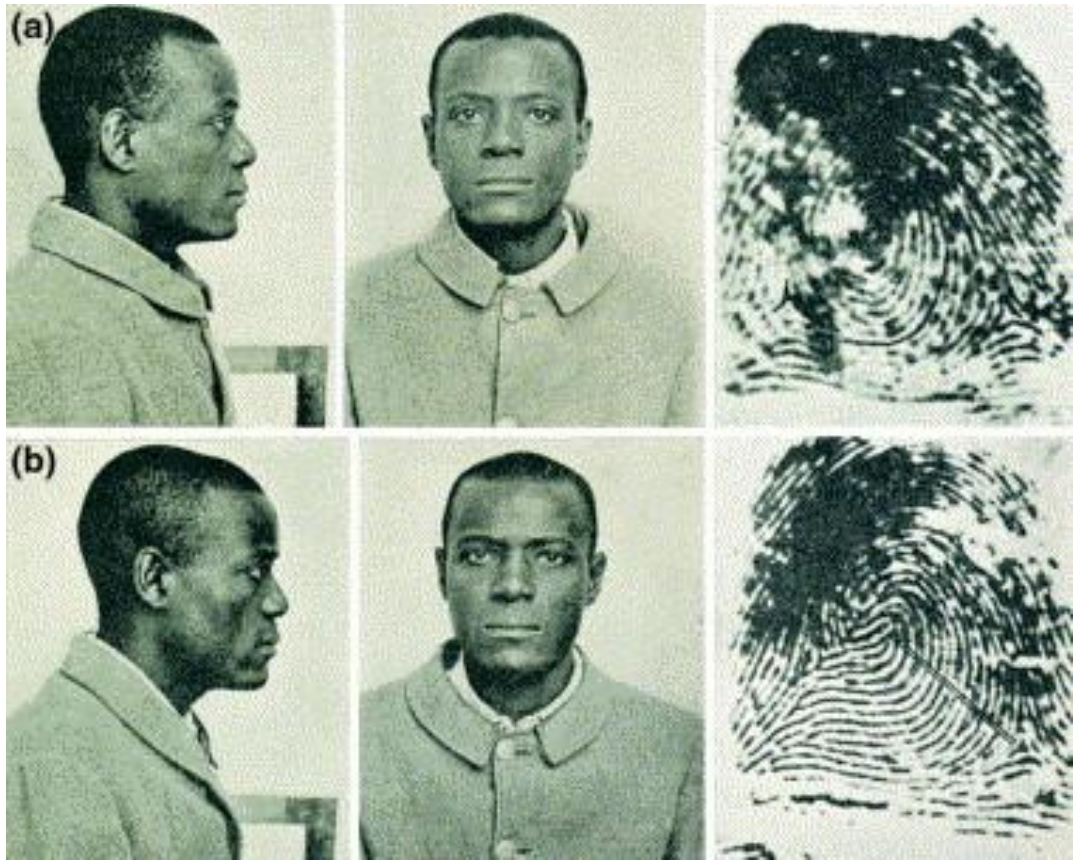
More Info:

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

Bertillionage



William West



https://dh.dickinson.edu/digitalmuseum/exhibit-artifact/babes-in-the-woods/fingerprints

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