

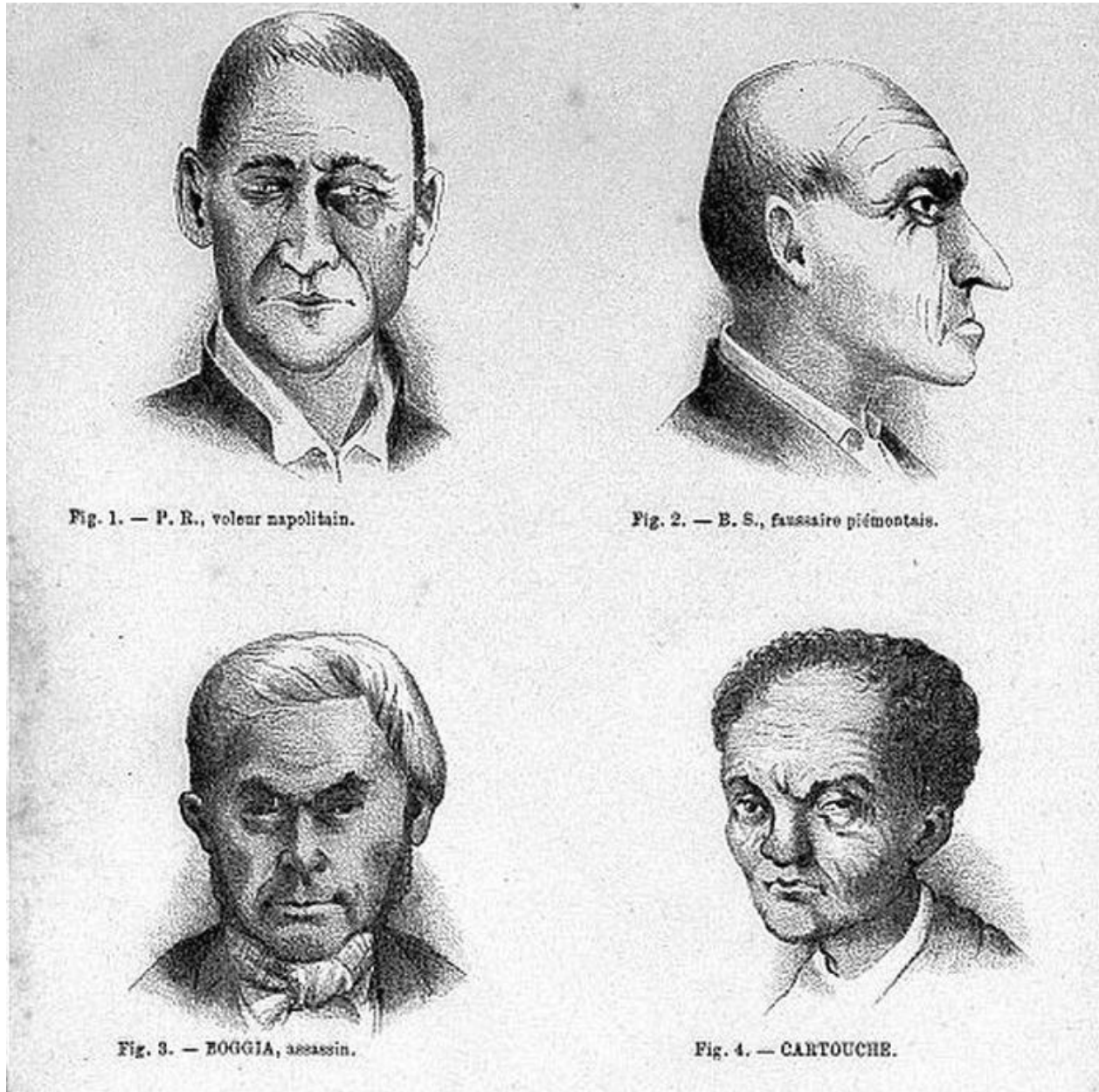
“In this work, we adopt the approach of data-driven machine learning to fully automate the assessment process, and purposefully take any subtle human factors out of the assessment process. Unlike a human examiner/judge, a computer vision algorithm or classifier has absolutely no subjective baggages, having no emotions, no biases whatsoever due to past experience, race, religion, political doctrine, gender, age, etc., no mental fatigue, no preconditioning of a bad sleep or meal. The automated inference ... eliminates the variable of meta-accuracy (the competence of the human judge/examiner) all together. Besides the advantage of objectivity, sophisticated algorithms based on machine learning may discover very delicate and elusive nuances in ... characteristics and structures that ... hide below the cognitive threshold of most untrained nonexperts.”

Wu and Zhang, 2016

...

# Case Study

“Relax, You look criminal!”



Cesare Lombroso  
Physiognomic Criminology

Moral composition can be  
determined by physical &  
anatomical features

No scientific basis to any of his  
theories!

# Training Phase

Non-criminals



Convicted  
Criminals



ML algorithm learns all kinds of statistical patterns to differentiate the two

Model  
Discriminative features to tell apart a criminal from a non-criminal



# Training Phase

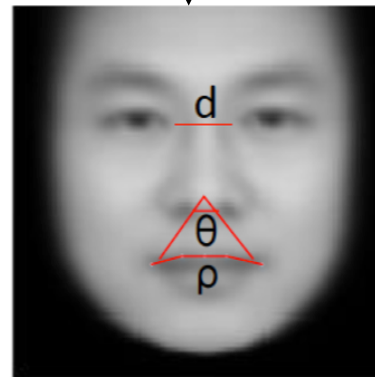
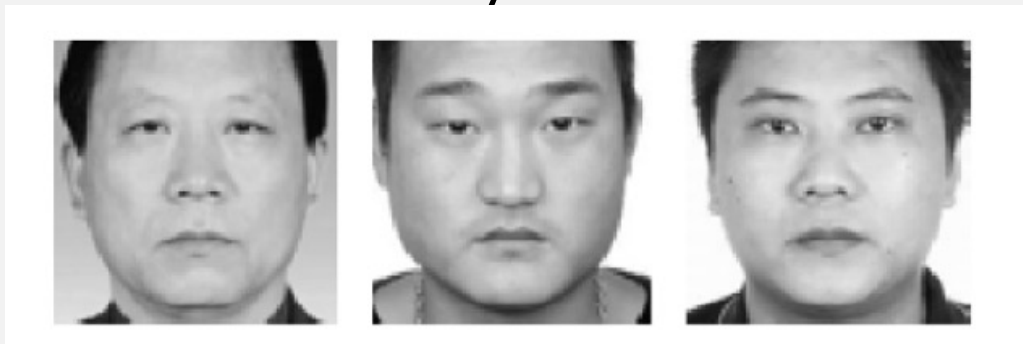


Non-criminals  
Linked-in/Company Photos (not selfies)

All Chinese men in  
the same age group



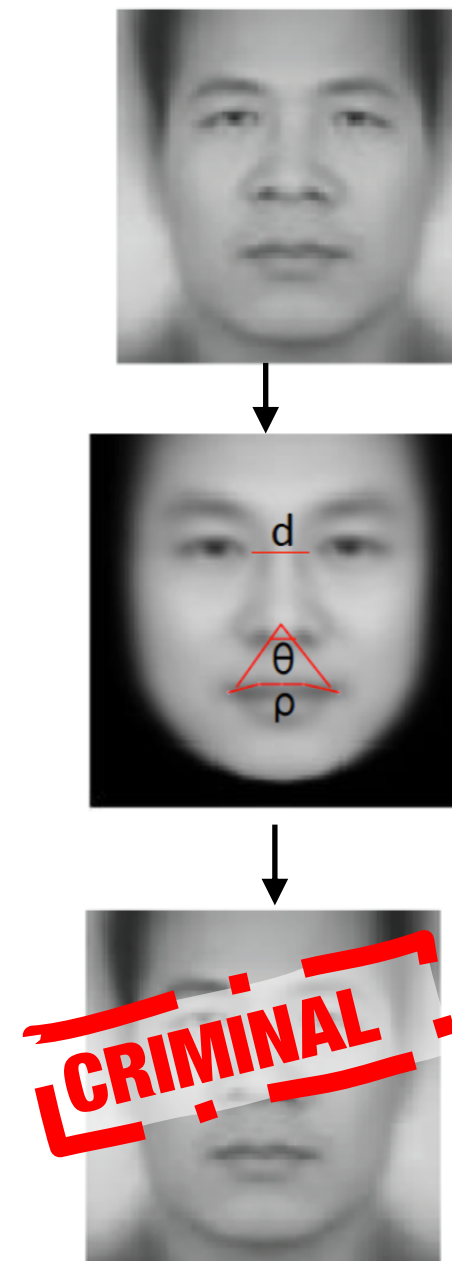
Convicted Criminals  
Government ID photos (not mug shots)



Discriminative features of criminality 89-90% accuracy:

- shorter distances  $d$  between the inner corners of the eyes,
- smaller angles  $\theta$  between the nose and the corners of the mouth,
- and higher curvature  $\rho$  to the upper lip.

What are the likely explanations?



“Extraordinary claims require extraordinary evidence”

Carl Sagan, Astronomer, Science Communicator, Creator of Cosmos

# Participation (the 5%)

Attendance is not enough

Engaging in class discussions

Engaging in outside class discussions

- Read a course reading, book, article, blog post, ...

- How did influence it you?

- Write it a up in a post – doesn't have to be large (one reading and one post is not enough!)

- Share it with your peers

- Respond to your peers