Biometric systems and Presentation Attack Detection

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22 Slides

Outline

- Introduction
- What should I do?
- Anti-Spoofing or PAD

Introduction

Birth date: 16 September, 1989
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Ardabil

Education

University of Tabriz

Tabriz, Iran

M.Sc., Artificial Intelligence
2013-2015

Thesis (MSc)

Learning Hierarchical Representations for Video Analysis Using Deep Learning

Advisors:

Dr. Seyed-Naser Razavi

Dr. Ghader Karimian-Khosroshahi

Publications

➢ **Title:**

Combined Multi-Agent Method to Control Inter-Department Common Events Collision for University Courses Timetabling

➢ **Authors:**

Jalil Nourmohammadi-Khiarak, Y. Zamani-Harghalani, Mohammad-Reza Feizi-Derakhshi

➢ **Journal:**

Journal of Intelligent Systems

Publications

➢ **Title:**

New Hybrid Method for Feature Selection and Classification using Meta-heuristic Algorithm in Credit Risk Assessment

➢ **Authors:**

Jalil Nourmohammadi Khiarak, Fatemeh Razeghi, Mohammad Reza Feizi Derakhshi, Samaneh Mazaheri, Yashar Zamani-Harghalani, Rohollah Moosavi Tayebi

➢ **Journal:**

To be submitted

Jalil Nourmohammadi Khiarak, Fatemeh Razeghi, Mohammad Reza Feizi Derakhshi, Samaneh Mazaheri, Yashar Zamani-Harghalani, Rohollah Moosavi Tayebi, "New Hybrid Method for Feature Selection and Classification using Meta-heuristic Algorithm in Credit Risk Assessment", Advances in Electrical and Computer Engineering (Withdraw), 2017.

Publications

➢ **Title:**

New Hybrid Method for Heart Disease Diagnosis Utilizing Optimization Algorithm in Feature Selection

➢ **Authors:**

Jalil Nourmohammadi Khiarak, Fatemeh Razeghi, Mohammad Reza Feizi Derakhshi, Samaneh Mazaheri, Yashar Zamani-Harghalani, Rohollah Moosavi Tayebi

➢ **Journal:**

BioData Mining (submitted)

Jalil Nourmohammadi-Khiarak*1, Mohammad-Reza Feizi-Derakhshi2, Khadijeh Behrouzi3, Samaneh Mazaheri4, Yashar Zamani-Harghalani5, Rohollah Moosavi Tayebi6, "New Hybrid Method for Heart Disease Diagnosis Utilizing Optimization Algorithm in Feature Selection", BioData Mining (submitted), 2017.

Other Publications

•Firouzeh Razavi, **Jalil Nourmohammadi Khiarak**, Samaneh Mazaheri, Mohamad Jafar Tarokh,"Recognizing Farsi Numbers utilizing Deep Belief Network and Limited Training Samples", The 10th Iranian Conference on Machine Vision and Image Processing, (in press), 2017.

•Yashar Zamani-Harghalani, **Jalil Nourmohamadi-Khiarak**, "Improving Recommender System Using Cuckoo Algorithm", 7th International Conference on Electrical and Computer Engineering, Iran, 2015, (Persian Language).

•Nasim goldust,Mohammad-Ali Balafar, Yashar Zamani Harghalani, **Jalil Nourmohamadi-Khiarak**, "Segmentation Of Medical Images Based On Landmark Using Cooperative Game Theory", 7th International Conference on Electrical and Computer Engineering, Iran, 2015, (Persian Language).

•Abbas Mirzaei Somarin, **Jalil Nourmohamadi-Khiarak**, "A new method to optimize estimate distance using the normalized and calibration Algorithm", 3th International Conference on Electrical and Computer Engineering, Iran, 2011, (Persian Language).
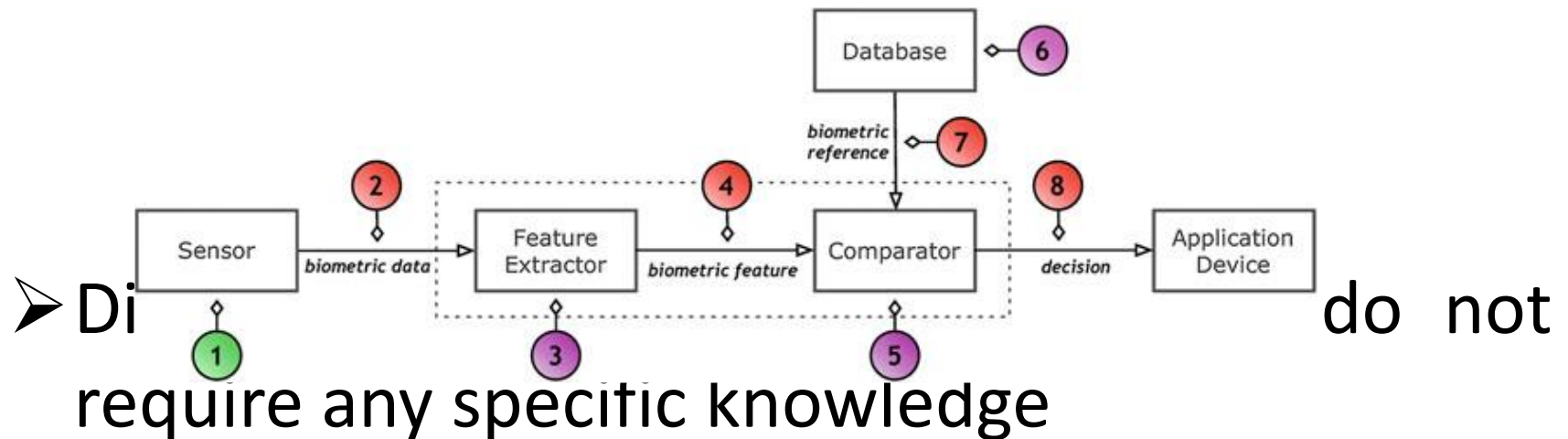
What Should I do?

ESR 5 – Countermeasure algorithms against subterfuge in mobile biometric systems

- Propose a Presentation attack detection methods

- Statistical methodology for PAD

- A working prototype on an example mobile device.

Attack

An act of circumventing a biometric system by adversaries is referred as an attack.

➢ **Indirect:** these attacks are performed inside the system.

➢Di   do not
require any specific knowledge

Spoofing

Is a direct attack performed at the sensor level outside the digital limits on the system.
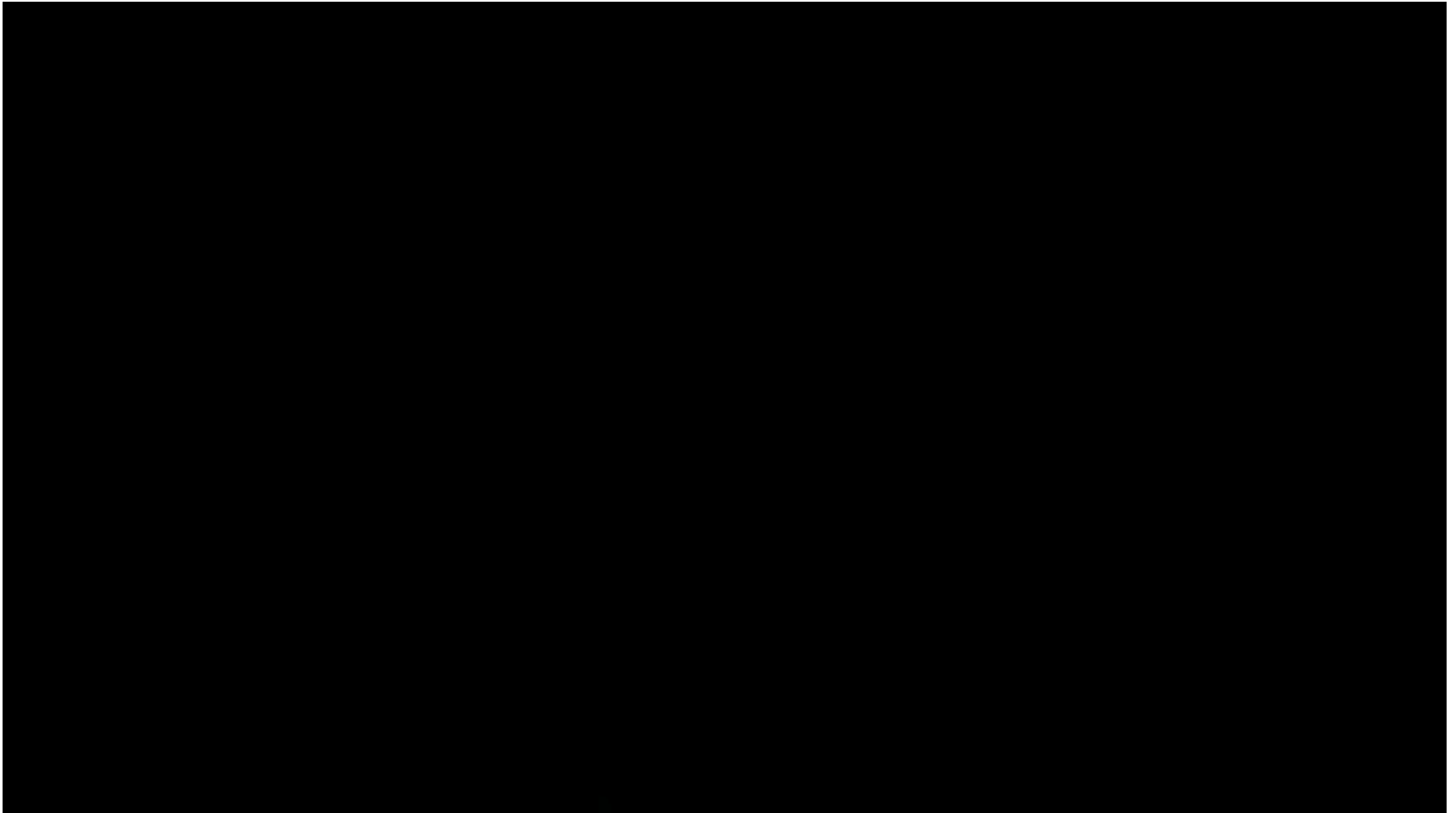
Anti-Spoofing = PAD

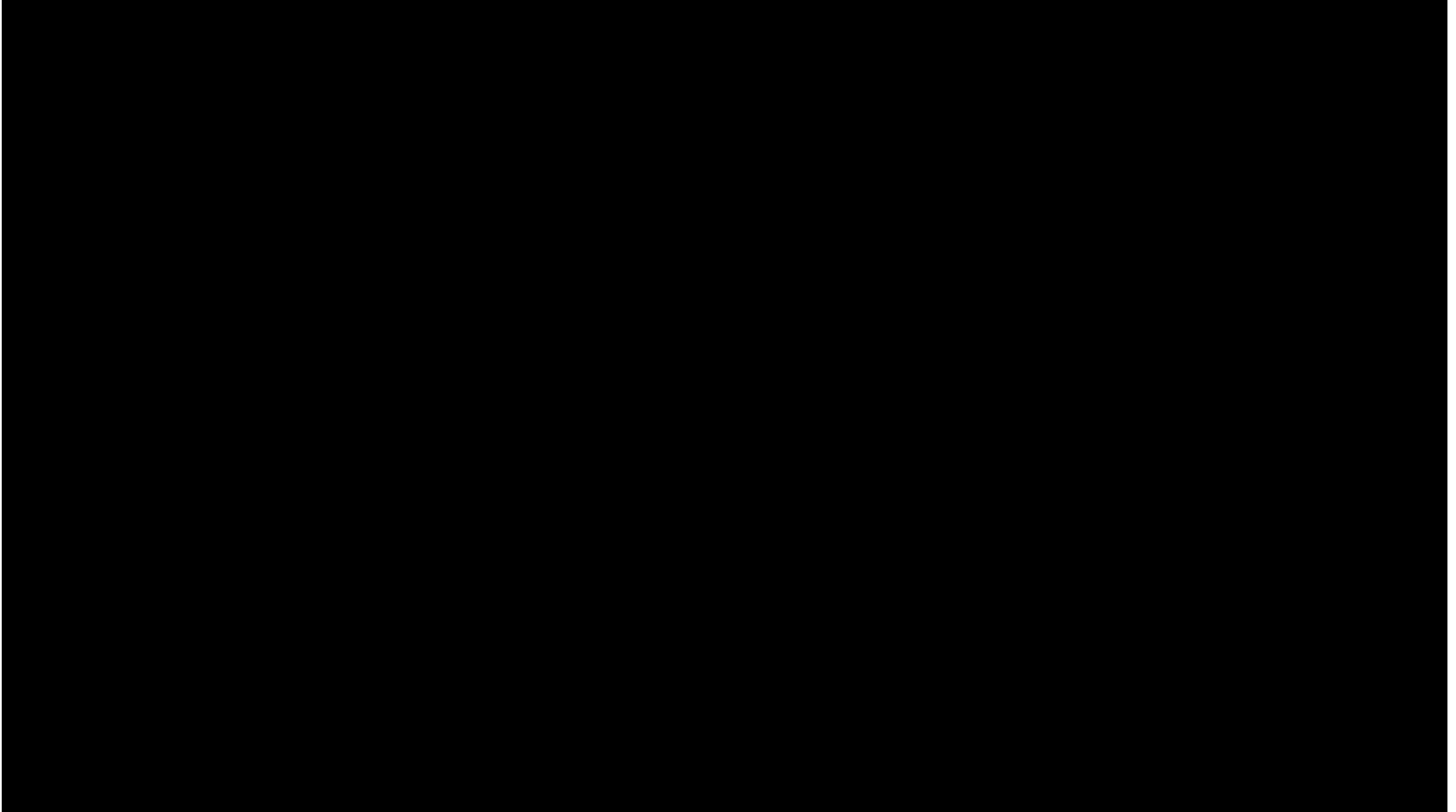Refers to the countermeasures to detect and avert these attempt.
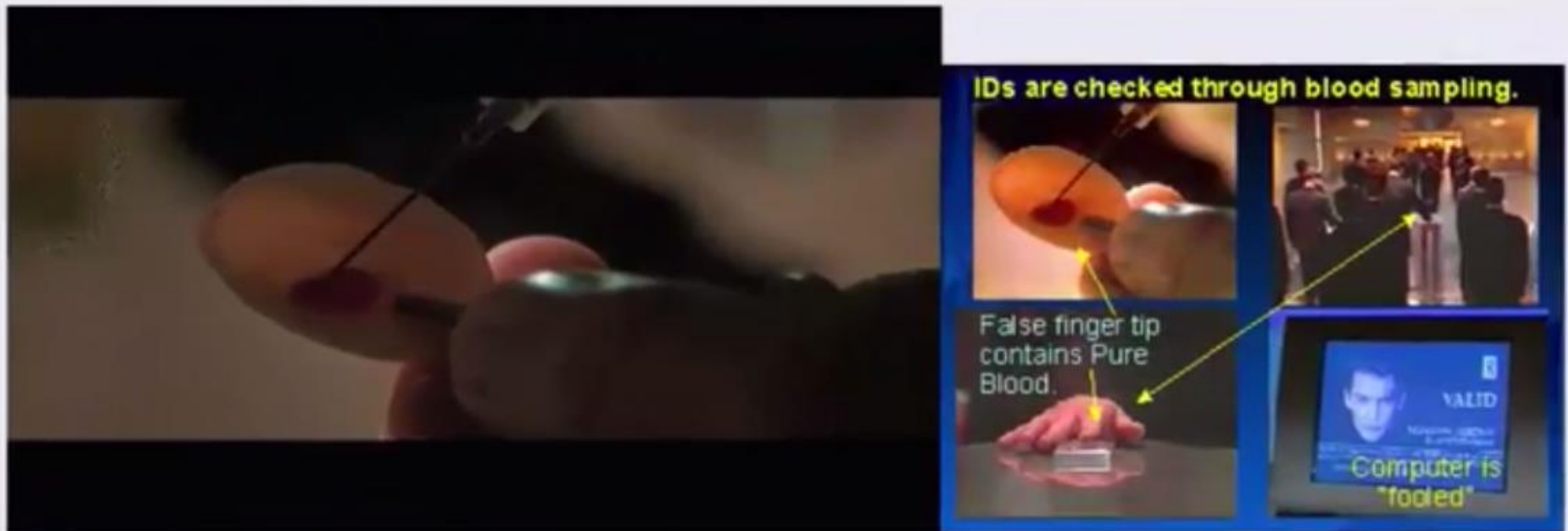
Voice Spoofing

(Sneakers)

Iris Spoofing
(from YouTube)

DNA

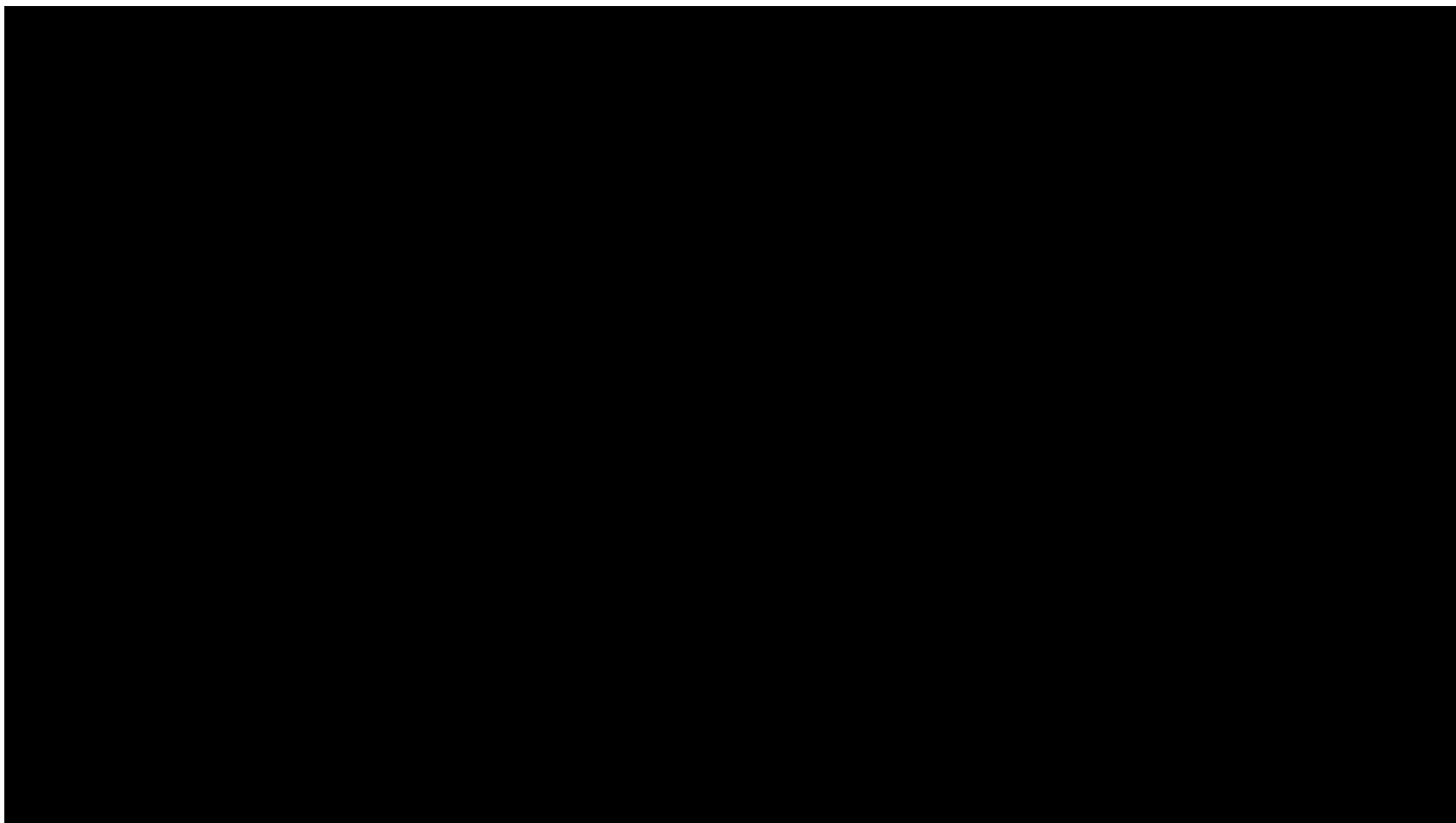GATTACA (1997)

IDs are checked through blood sampling.

False finger tip contains Pure Blood.

Computer is "fooled"

VALID

Lecture_ Spoofing and Anti-Spoofing in Biometrics, From YouTube

Fingerprint Spoofing

Face PAD

TRUSTED BIOMETRICS UNDER SPOOFING ATTACKS

Three main group Anti-Spoofing = PAD

- Checking Intrinsic Properties
- Detecting Liveness
- Detecting Counterfeit

Next Session

- State-of-the-art Anti-Spoofing on mobile

Question?