Weakly Supervised Training for Hologram Verification in Identity Documents

Glen Pouliquen[1,2], Guillaume Chiron[1], Joseph Chazalon[2], Thierry Géraud[2], Ahmad Montaser Awal[1]

IDnow. LRE

[1] IDnow, Cesson-Sévigné, France
[2] EPITA Research Lab. (LRE), Le Kremlin-Bicêtre, France

Code and data: https://github.com/EPITAResearchLab/pouliquen.24.icdar

Introduction

Context: remote verification of ID documents to comply with Know Your Customer (KYC) regulation

Task: Integrity verification of Optically variable devices (OVDs) or "holograms" used to secure ID docs.

Challenges: Weak signals, changing background (face picture)
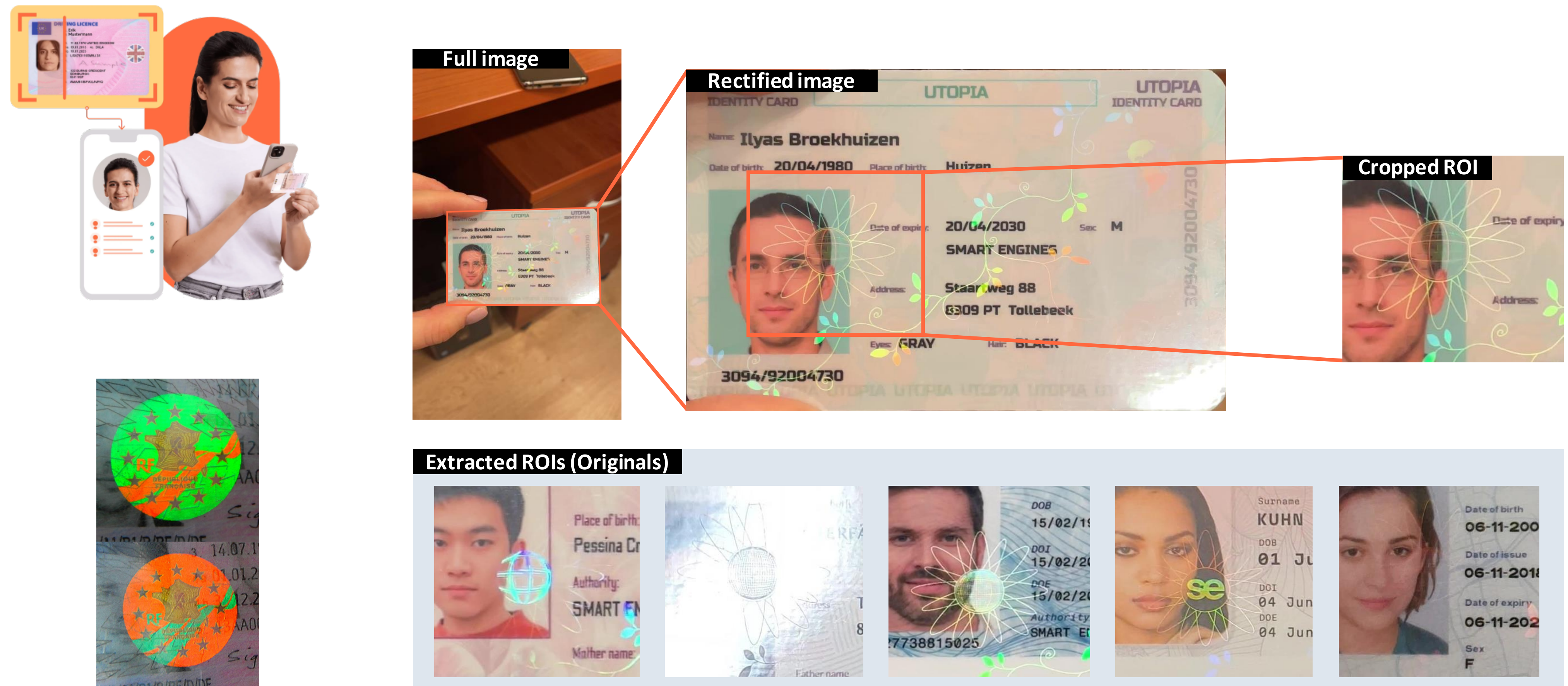How to model and verify ***appearance*** and ***behaviour*?

Data: MIDV Datasets

Fig 1. Extracted ROIs from the MIDV-Holo dataset

Method

Input: Sequence of cropped images
Output: Authenticity indicator

Main contributions:
- Learn hologram representation with contrastive loss
- Robust to static attacks: checks holographic behaviour
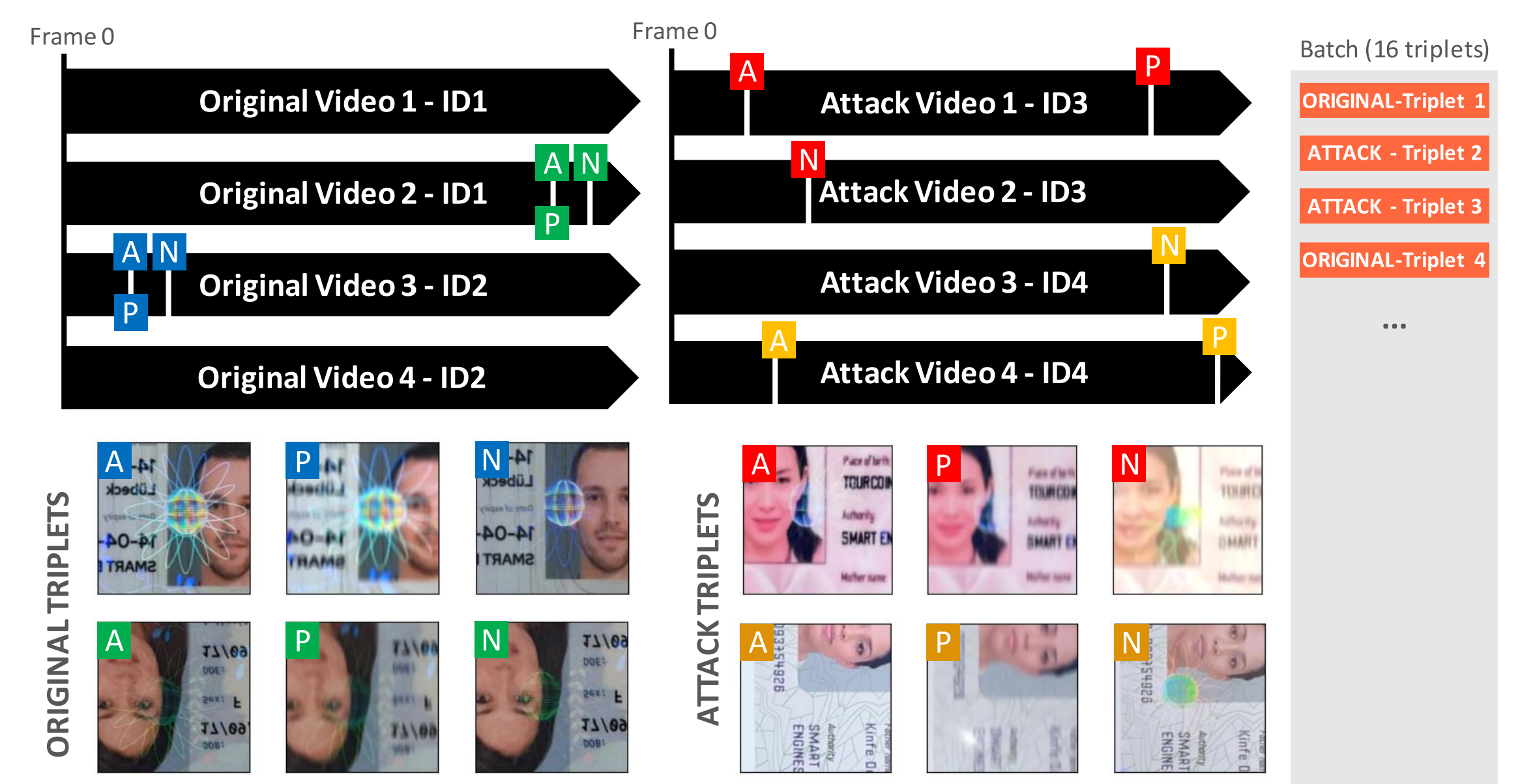- Weakly supervised: video level annotation
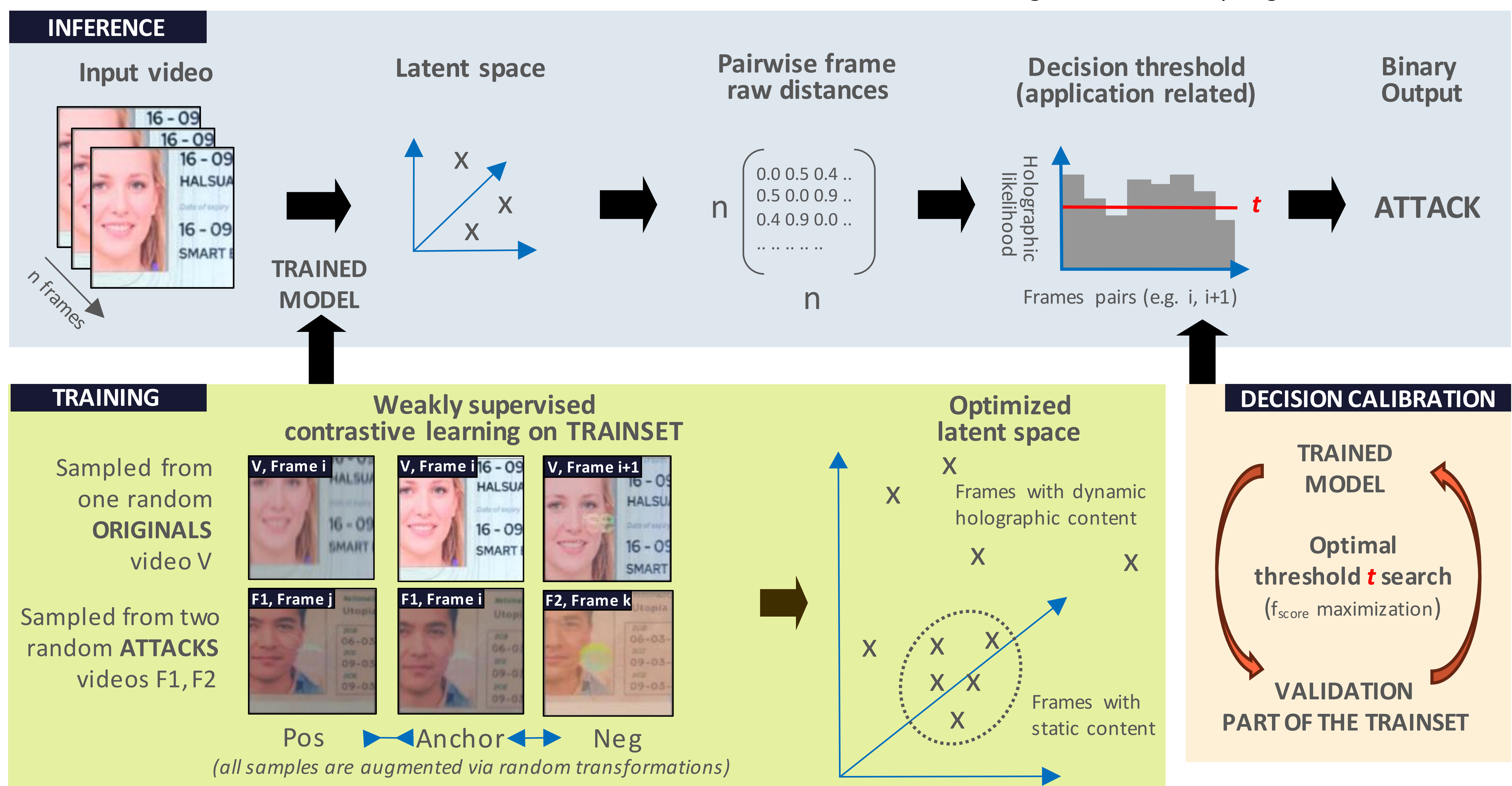

Fig 3. Frame sampling overview

Fig 2. Proposed approach overview: 1) Hologram representation that discards the background 2) Control dispersion of the representations

Experiments

- Trained on 1 dataset (MIDV-Holo "Vanilla")
  - Focus on the face picture region
- Tested on 3 datasets
- Comparison to a reproduced MIDV-Holo ROI
- Evaluated on attack detection

	MIDV-HOLO "Vanilla" (120 mixed vids)	MIDV-HOLO "Photo repl." (20 attack vids)	MIDV 2020 "Clips" (1k attack vids)
Test dataset →			
Metric → Method ↓	F_{score} (%)	*Recall* (%)	*Recall* (%)
MIDV-Holo ROI	80 ± 3	63 ± 10	92 ± 2
OUR - $mobilevit_{xxs}$	90 ± 2	87 ± 14	93 ± 6