

# DETECTION OF FACE SPOOFING USING VISUAL DYNAMICS

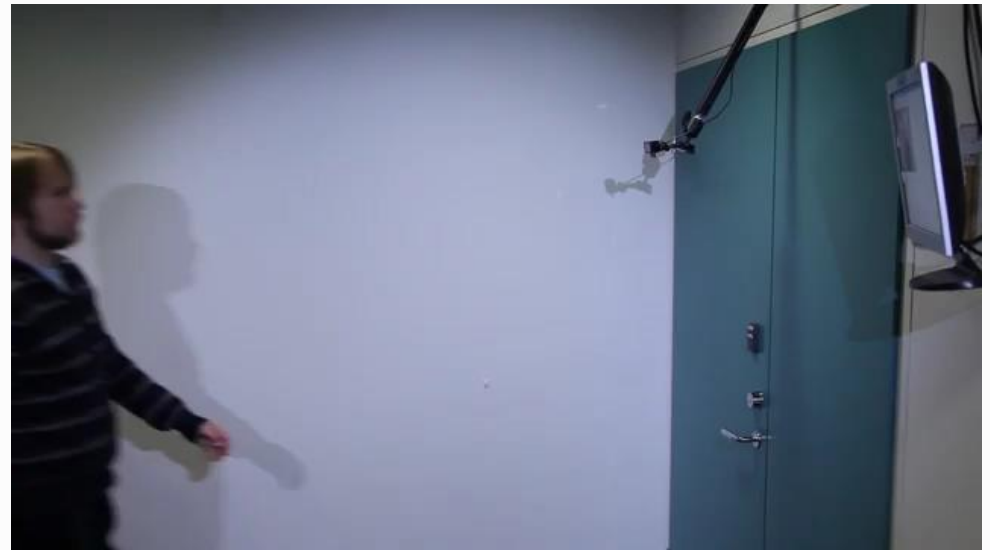
Tirunagari et al.



# WHAT IS FACE SPOOFING ?



IIIT - Ahmedabad



University of Oulu - Finland

# BACKGROUND ON ATTACKS



Genuine user



Cut photo attack



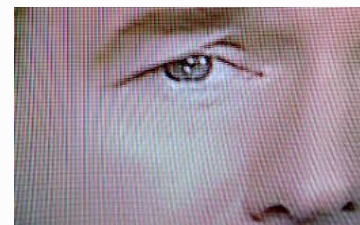
Detection of Face Spoofing using Visual Dynamics - Computing PGR Conference 2015

Photo attack



Replay attack

# EXISTING SOLUTIONS



# OUR PROPOSAL : COMPLETE DATA DRIVEN

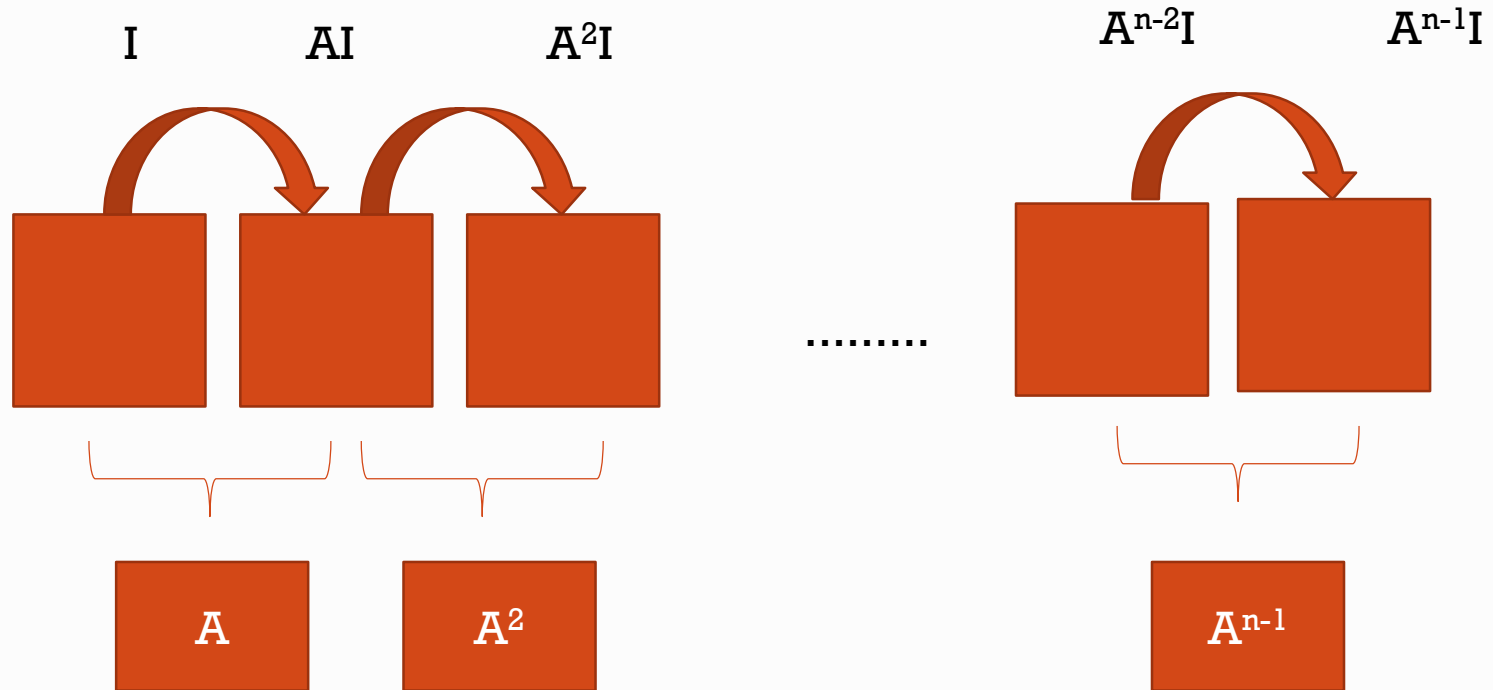
Controlled scenario

Video clip 1

Video clip 2

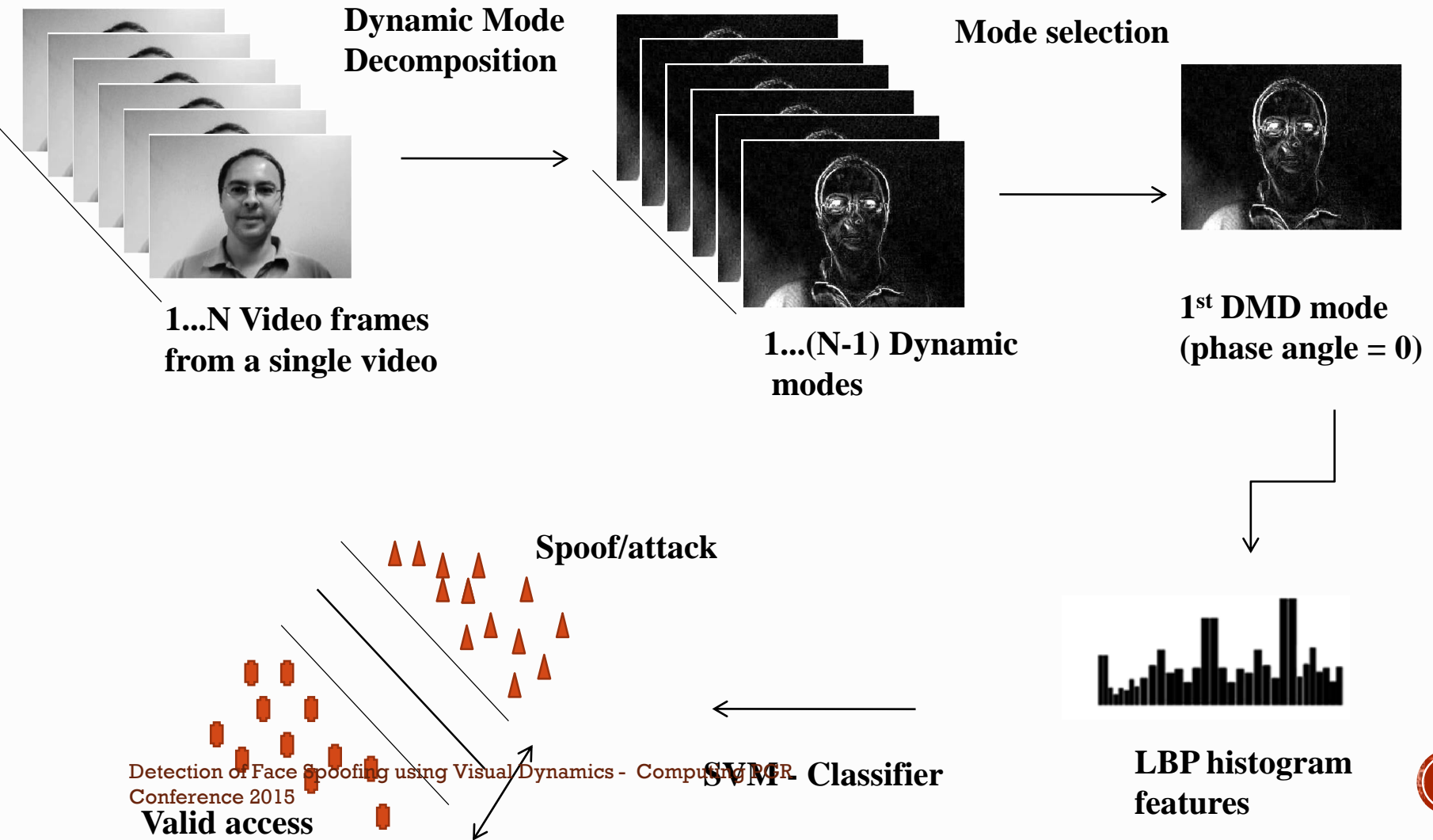


# OUR PROPOSAL : DMD



DMD is well known in fluid dynamics community and captures motion information

# PIPELINE: DMD+LBP+SVM



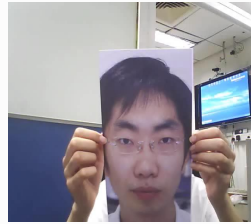
# DATASETS

- IDIAPS - Print attack dataset
- IDIAPS - Replay attack dataset
- Casia – FASD dataset



# CASIA-FASD

Original



DMD



PCA



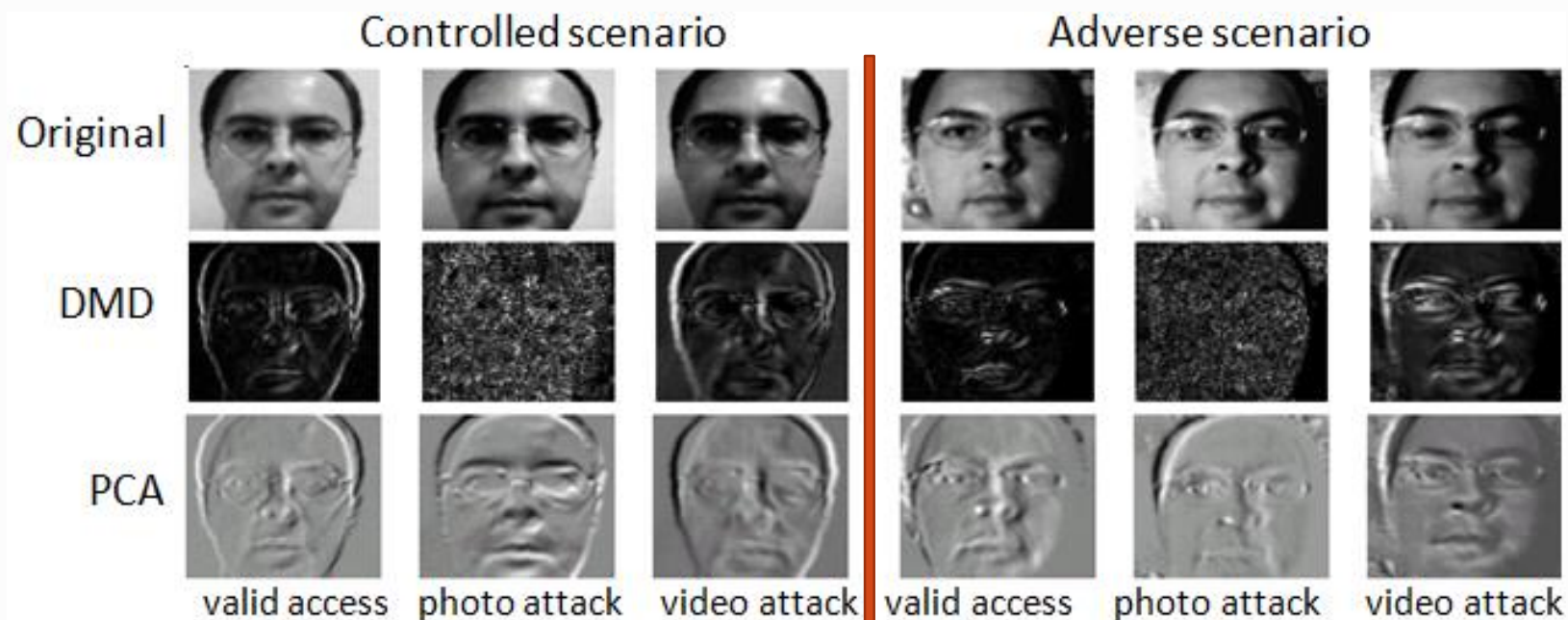
valid access

photo attack

cut photo attack

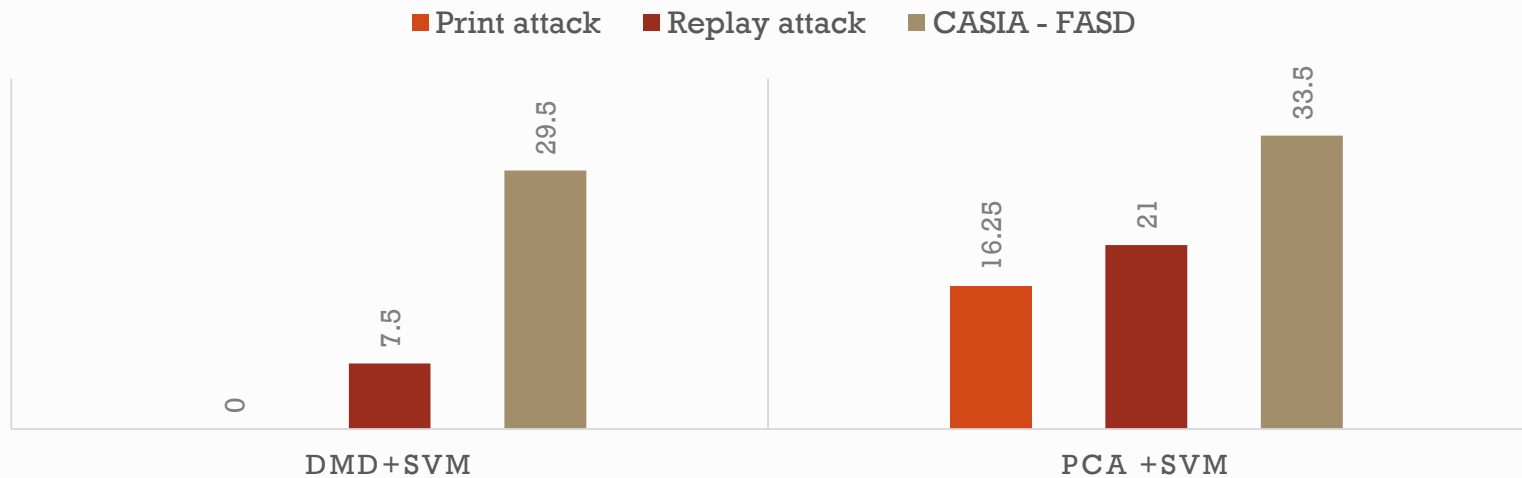
video attack

# PRINT AND REPLAY ATTACK DATASETS



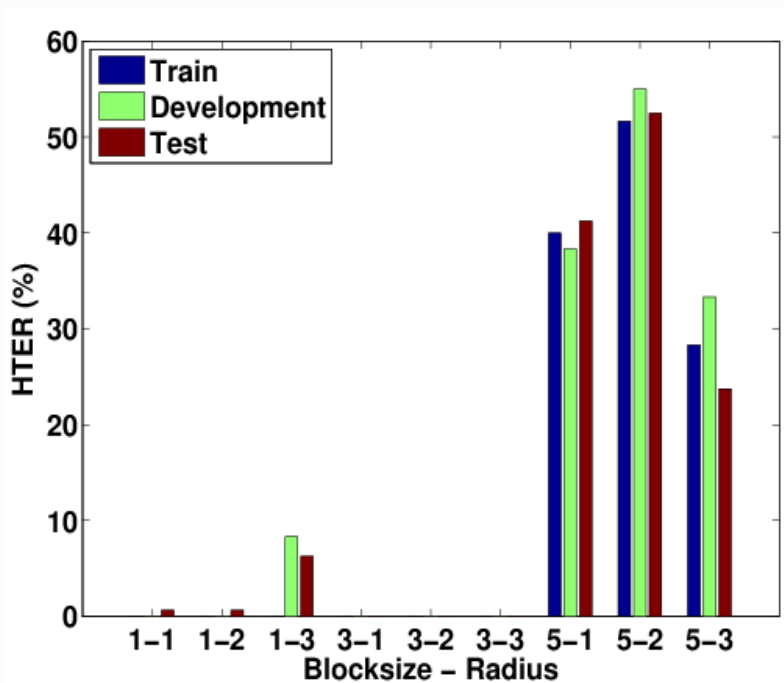
# DMD/PCA + SVM

## HTER (%)

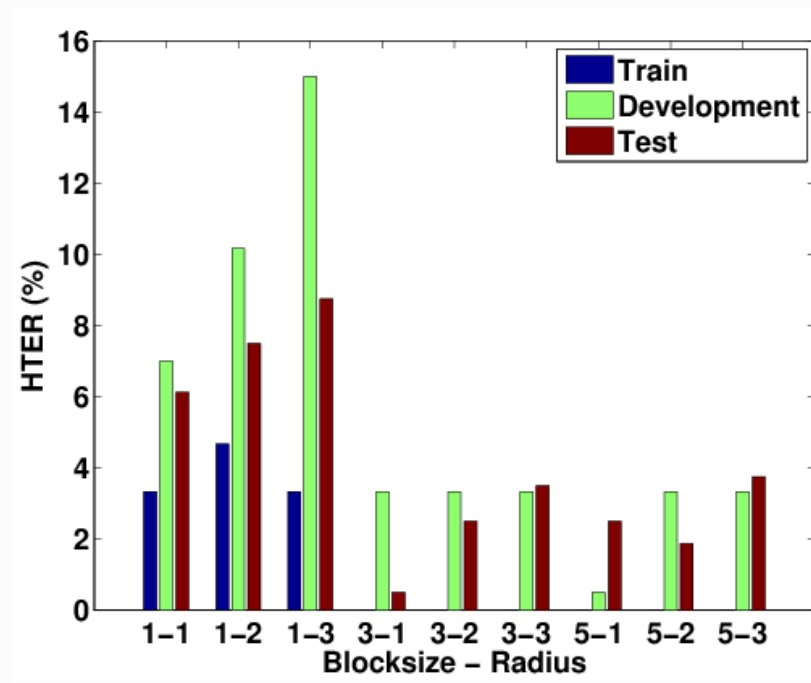


Pipeline	Print attack	Replay attack	CASIA - FASD
DMD+SVM	0.00	7.50	29.50
PCA+SVM	16.25	21.00	33.50

# IMPACT OF LBP PARAMETERS



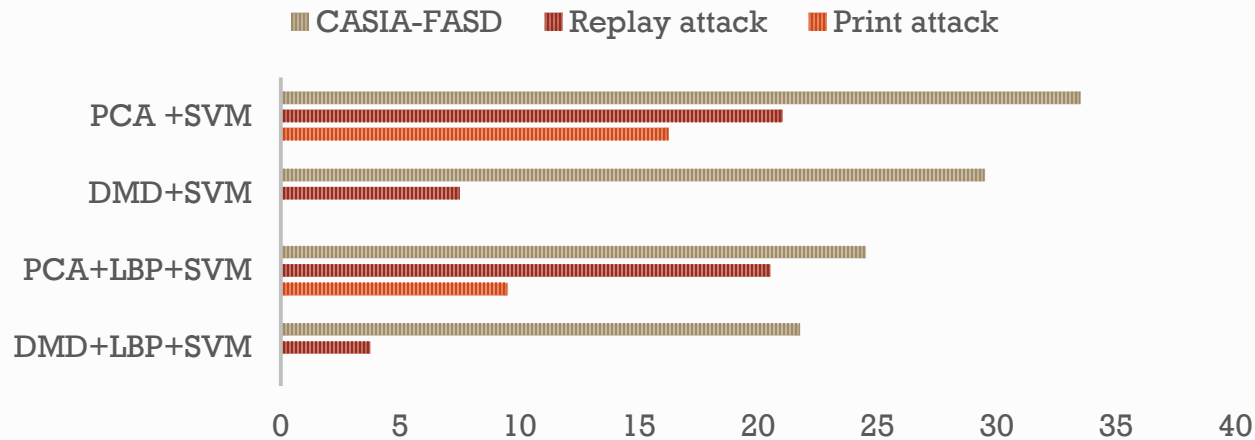
(a) Print attack dataset



(b) Replay attack dataset

# DMD+LBP+SVM

## RESULTS IN HTER(%)



Pipeline	Print attack	Replay attack	CASIA - FASD
DMD+LBP+SVM	0.00	3.75	21.75
PCA +LBP+SVM	9.50	20.50	24.50

# COMPARISON TO STATE OF THE ART

	Algorithm	Print attack	Replay attack	CASIA-FASD
Anjos <i>et al.</i> (2011) [23]	Optical flow correlation	8.98	-	-
Schwartz <i>et al.</i> (2011) [19]	Partial least squares	-	-	-
Pereira <i>et al.</i> (2013) [53]	Motion correlation	-	11.79	30.33
	LBP	-	15.45	23.19
	LBP-TOP	-	8.51	23.75
	-	-	-	-
Chingovska <i>et al.</i> (2012) [25]	LBP+LDA	-	13.87	-
	LBP+SVM	-	18.17	-
Proposed method	DMD+LBP+SVM on entire video	0.00	0.00	-
	DMD+LBP+SVM on face regions	0.00	3.75	21.75
	DMD+SVM on face regions	0.00	7.50	29.50
	PCA+SVM on face regions	15.11	21.50	33.50
	PCA+LBP+SVM on face regions	5.11	17.11	24.50
	PCA+LBP+SVM on entire video	9.50	20.50	-

# CONCLUSION

University of Oulu - Finland





S Tirunagari, N Poh, D Windridge, A Iorliam, N Suki, A Ho  
Information Forensics and Security, IEEE Transactions on 10 (4), 762 - 777



# SELECTION OF MODE

