

Positive ID of a Human

Review of the Last Netted Sensor Workshop

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Workshop Objectives

- Understand the state-of-the-art capabilities in standoff biometrics under non-optimal conditions
 - Iris
 - Facial ID
 - Multi-modal Biometrics
- Exchange ideas on most promising areas of research to achieve positive identification of a human from a distance

Accomplishments

- Awareness of biometric research sponsored/conducted by NIST
 - Facial ID Grand Challenge
 - Iris Grand Challenge
 - Biometric feature databases
- Awareness of biometric research being conducted by industry and academia
- Appreciation of some of the technical challenges associated with matching standoff biometric data with archived information
 - Aspect (Pose)
 - Illumination
 - Expression
 - Occlusion
 - Aging
 - CC&D

Biometric Features

- 2D and 3D facial images
- Iris images
- Gait
- Speaker Recognition
- Metrics (e.g., height, Golden ratios, etc.)
- Odor
- Ear
- Vasculature (Eye, Hand and Face)

Biometric Feature vs. Sensing Modality Matrix

Sensing Modality \ Biometric Feature	Thermal IR Video	SWIR Video	E/O Video	E/O Still	Image-Intensified Video	Image-Intensified Still	LIDAR	MSI (Including IR)	HIS (including SWIR)	Doppler Radar	Acoustic	Chemical	Magnetic
2D Facial ID		2											
3D Facial ID			1	1	1	1	1						
Facial Expression													
Ear													
Iris ID													
Speaker Recognition													
Gait													
Golden Ratios													
Height			3	3	3	3	3						
Eyelid													
Odor													
Eye Vasculature													
Hand Vasculature													
Face Vasculature													

Operational Constraints

- Biometric Feature Persistence
- Ease of Defeat (CC&D)
- Detection Range (Resolution)
- Environmental Conditions (e.g., Illumination, inclement weather, etc.)
- Cultural Dependency (e.g., clothing, diet, etc.)
- Response Time (processing)
- Pose Tolerance
- Occlusion Tolerance
- Variable Resolution Tolerance
- Ambient Noise Tolerance

Biometric Feature vs. Operational Attributes

Operational Attribute Biometric Feature	Persistence	Defeat (CC&D)	Detection Range	Day/Night Operation	Incliment Weather Tolerance	Indoor	Outdoor	Cultural Dependency	Response Time (Processing)	Pose Tolerance	Occlusion Tolerance	Variable Resolution Tolerance	Ambient Noise Tolerance
2D Facial ID	Green	Yellow	Green	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Red	Yellow	Grey
3D Facial ID	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Grey
Facial Expression	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Grey
Ear	Green	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Green	Yellow	Red	Yellow	Grey
Iris ID	Green	Yellow	Yellow	Yellow	Red	Green	Yellow	Green	Yellow	Red	Red	Yellow	Grey
Speaker Recognition	Green	Yellow	Red	Green	Yellow	Green	Yellow	Green	Yellow	Grey	Red	Yellow	Yellow
Gait	Yellow	Red	Yellow	Green	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Grey
Golden Ratios	Green	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Grey
Height	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Red	Yellow	Grey
Eyelid	Green	Green	Yellow	Yellow	Red	Green	Yellow	Green	Yellow	Red	Red	Yellow	Grey
Odor	Green	Yellow	Red	Yellow	Red	Green	Yellow	Yellow	Red	Grey	Red	Yellow	Yellow
Eye Vasculature	Yellow	Green	Yellow	Yellow	Red	Green	Yellow	Green	Yellow	Red	Red	Yellow	Grey
Hand Vasculature	Yellow	Yellow	Yellow	Yellow	Red	Green	Yellow	Yellow	Yellow	Red	Red	Yellow	Grey
Face Vasculature	Yellow	Yellow	Yellow	Yellow	Red	Green	Yellow	Yellow	Yellow	Red	Red	Yellow	Grey

Questions?