

Team's Impression: Identity and Demographic Effects on Face Recognition

*Lecture attended by:
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Abstract: This document mainly focuses on the informational guest lecture “Identity and Demographic Effects on Face Recognition”, which was presented by Dr. Michael King. He discussed about the basics of identity and also explained the different levels of identities. He gave a brief insight into his research in Cyber Identity and Behavioral Analytics. He concluded the lecture by talking in detail about his recent study of Demographic Effects on Face Recognition.

Introduction: Dr. King gave an insight into his work in the intelligence community which was quite inspirational and also spoke about his transformation into an academician.

a) **Identity:**

Dr. King beautifully laid out the definition of identity and also discussed how it is being continuously morphed over the years. According to him, identity is no longer limited to name, date of birth or any other document which you can pull out from your wallet as a proof. Nowadays, identity of person can be extracted from the huge amounts of information one generates over the social media or from the person's travel, sleep, purchasing patterns, etc.

Then he explained the different levels of identities which can help answer the question “Who am I?”, as follows:

- I. **Individual Identity:** A set of assigned attributes used to identify an individual or a group. Ex: Name, Date of Birth, SSN, Employee Id.
- II. **Self Identity:** Information a person shares on the social media to describe themselves. Ex: Handsome, Intelligent, Kind, Compassionate.
- III. **Holistic Identity:** Full complement of information used to describe an individual. Ex: Travel patterns, buying habits, sleep patterns.

b) **Cyber Identity:**

He then defined the new age term for identity as “ the study of digital attributes, commonly referred to as digital dust that may be used to establish or strengthen linkages between a person and an online persona”. He also explained, how an individual with multiple online identities or personas can be tracked down to the same person.

Then he gave a brief insight into his research in Cyber Identity and Behavioral Analytics. He also explained how different parameters like behavior, bio graphics, relationships, biometrics, personality and physiology play a major role in his research.

According to him, **Biometrics** can be defined in two different ways:

As a characteristic

A measurable biological and behavioral characteristic that can be used for automated recognition.

As a process

Automated methods of recognizing an individual based on measurable biological and behavioral characteristics.

c) **Demographic effects of Race on Face Recognition:**

The objective of this study was to “Investigate the root causes of variations in performance accuracy of automated face recognition systems”. In this study, Dr. King and Dr. Bowyer, addressed the burning issue of bias in facial recognition algorithms. They also analyzed the impact of blooming effect i.e. loss in contrast on the face of a person wearing a light colored shirt and standing in front a white background, on the performance accuracy of the face recognition algorithms.

He also, described the datasets used like Morph, Notre Dame, MEDS II and different challenges faced due to the image quality in these datasets. He then excellently explained the bias introduced into the face recognition algorithms due to the presence of African American and Caucasian races in the data in large numbers.

He then explained the importance of having an accurate threshold in match score distributions to maintain the balance between false rejects and false accepts.

On the whole, the lecture was quite inspirational and gave us an insight into the various aspects of face recognition and biometrics. All the topics covered in this lecture were excellently supported by Dr. King’s experiences in the intelligence community and in the academics. We feel honored to have had an opportunity to listen to one of the leading researchers in the area of Biometrics and Cyber Identity, Dr. Michael King and whole heartedly thank Dr. Dozier for providing us with this opportunity.