Using Multiagents for Adaptive Score Selection in Face Recognition

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Introduction, Aims and Objectives

A typical face recognition system includes five main steps to identify a person: 1) facial data acquisition; 2) data pre-processing; 3) feature extraction; 4) feature classification; and 5) identification or identity verification.

Each step might be affected by multiple factors:

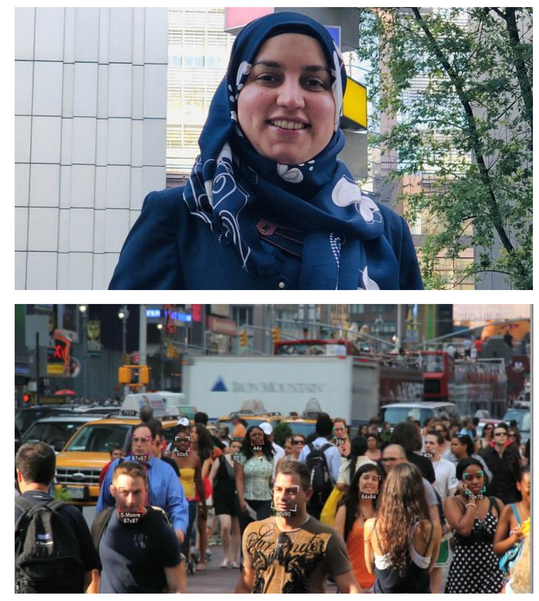
- Sensors quality, illumination, noise
- Type of user's interaction with the system
- The type of features and classifiers
- The image processing techniques applied at each step of its processes.

All these factors will affect the final objective of the system which is to accurately identify/verify the identity of a person through his/her facial data. Traditional face recognition system deals with each instance of identification in the same way irrespective of the circumstances in which the facial data were captured at different times or for different applications. Our aim is to improve the traditional face recognition process and improve the decision making process. This is by using agent technology that gives the system an intelligent mechanism in making a decision. We proposed a multiagent based framework to represent a context-aware face recognition system.

User

Application

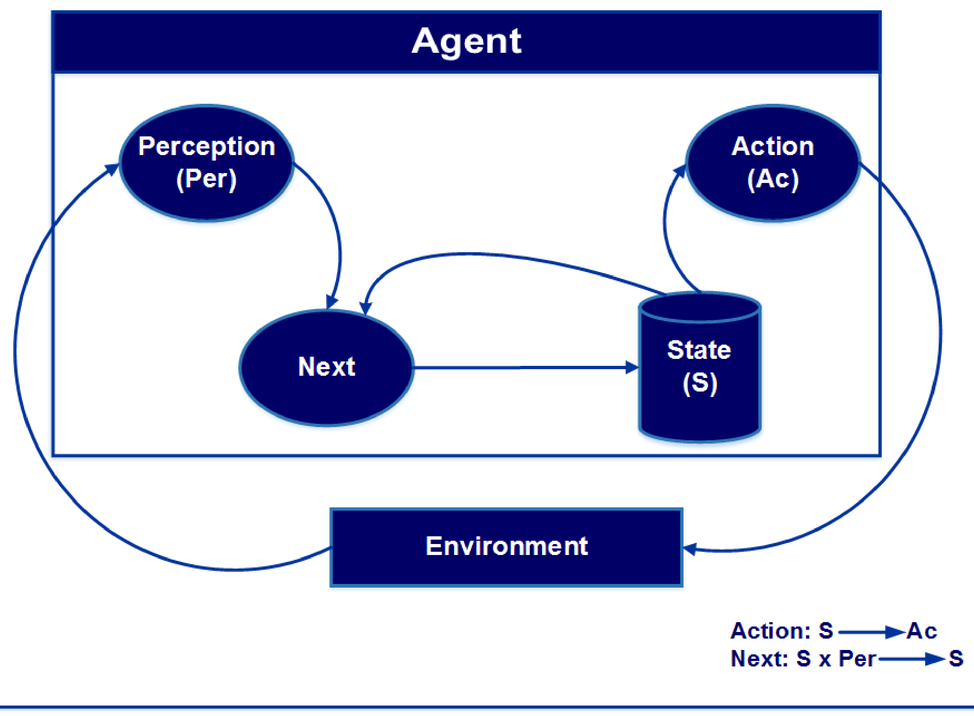
Environment



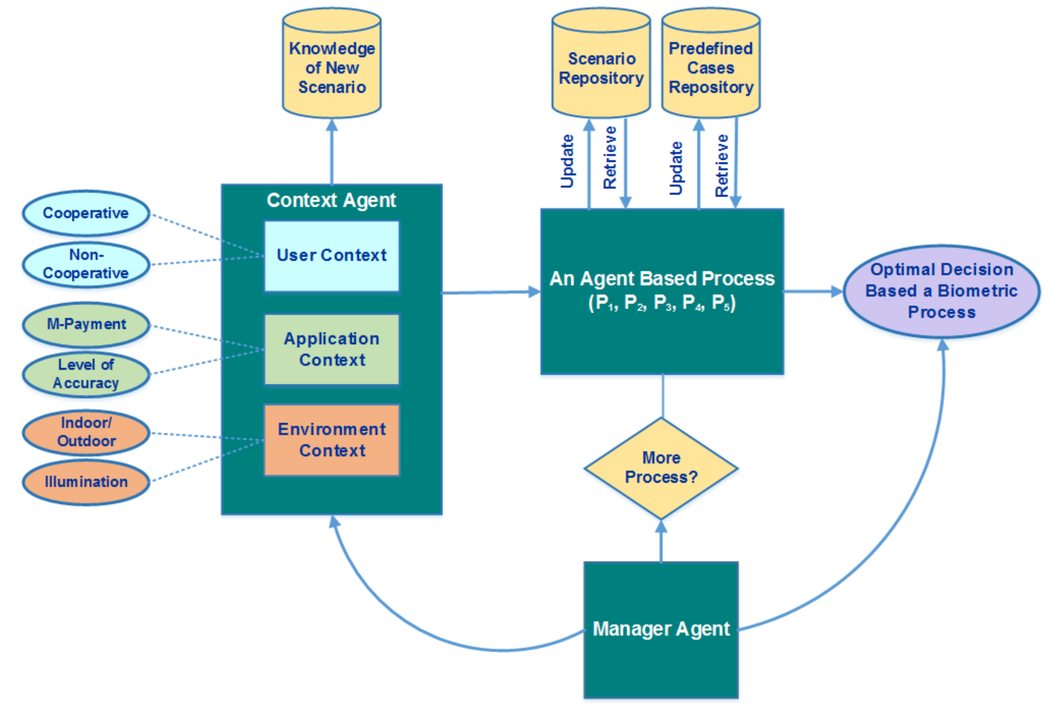
What is Context-Aware and Adaptive in Face Recognition?

Context-aware means at any given instance of identification or identity verification, the system is aware of the requirements of its user and application, and the state of its operational environment. The system has to respond adaptively to meet the above requirements. We propose a multiagent framework to represent a context-aware face recognition system. The agents will help conduct the system's internal processes in such a way that it will utilise the best approaches to identify/verify an individual at a particular instance of time.

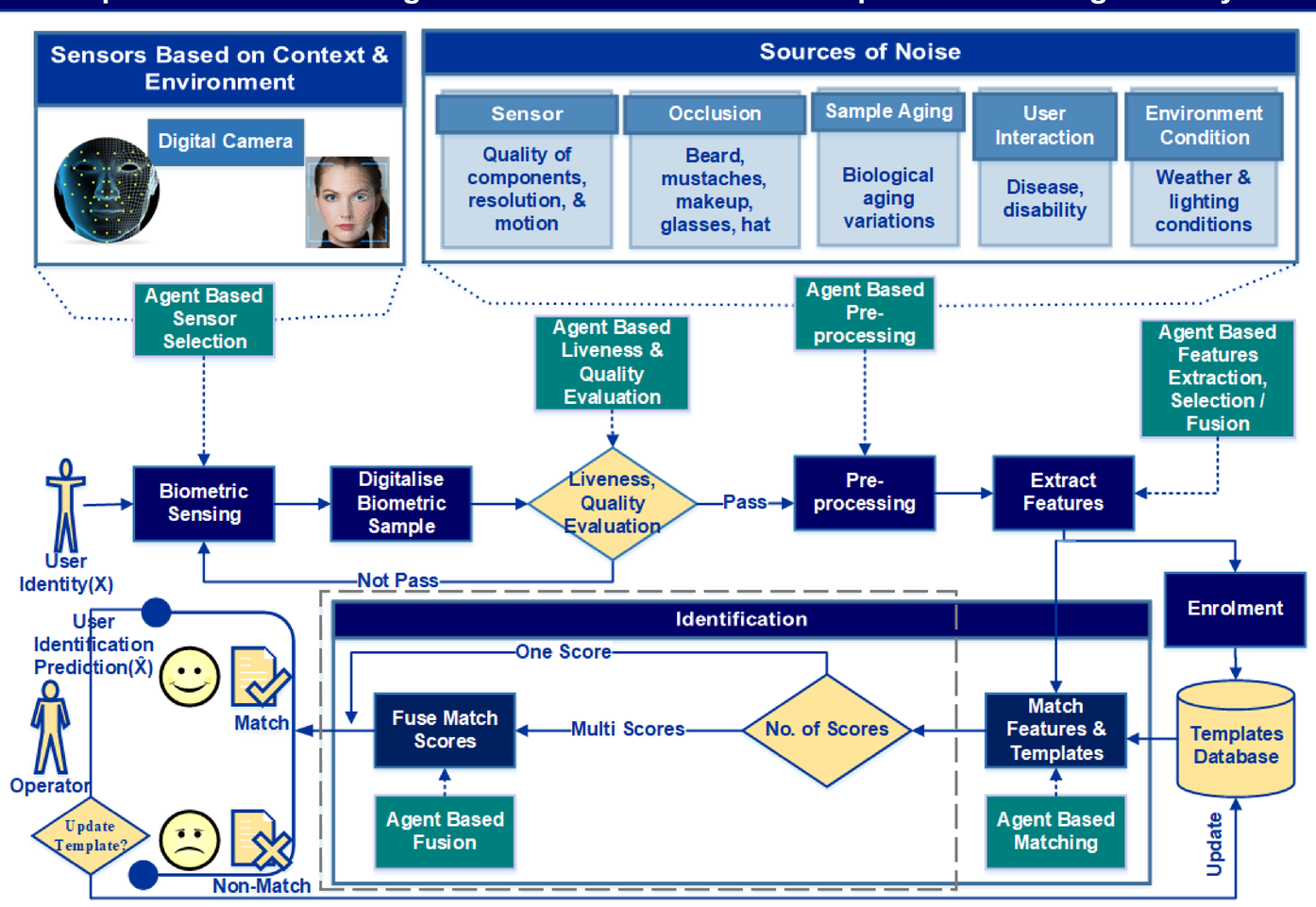
How an Agent Interacts with Its Environment



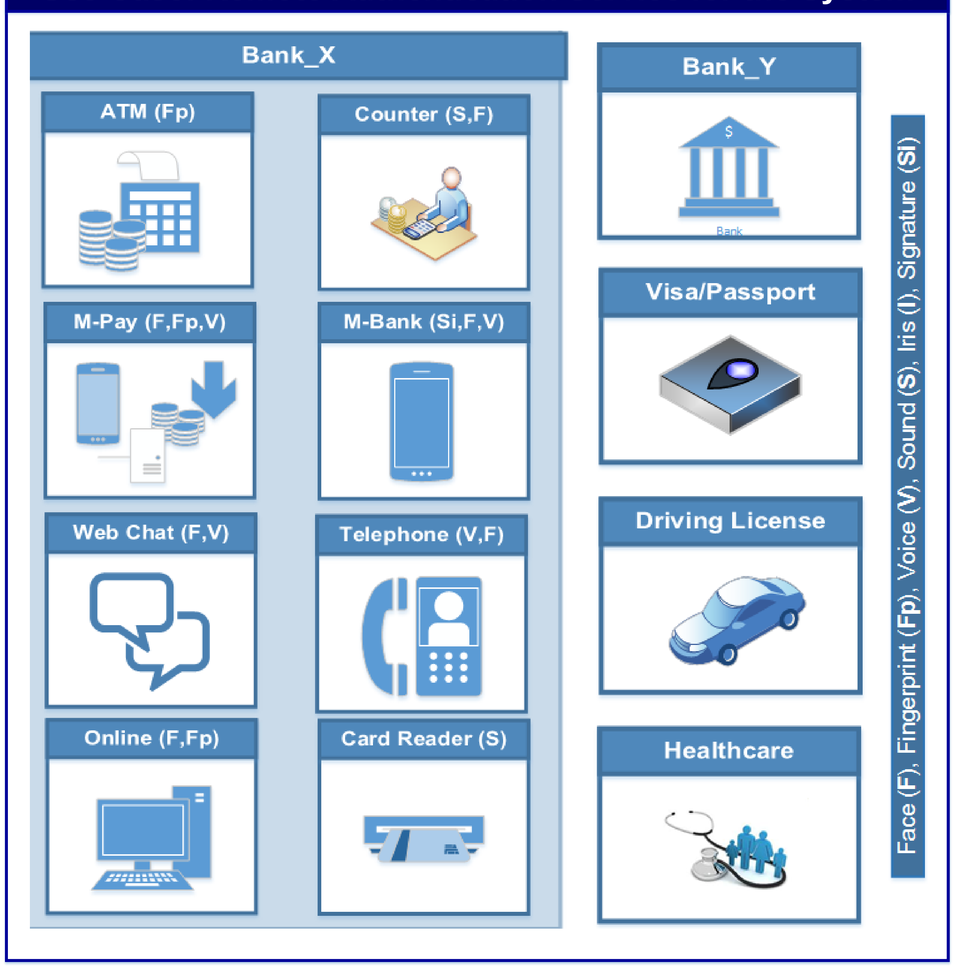
Overall Structure of Context-Aware Adaptive Face Recognition System



The Proposed Framework: Agent-Based Context-Aware Adaptive Face Recognition System



Use Case: Remote Authentication Service for the System



Conclusion and Future Work

We proposed a conceptual framework for context-aware adaptive face recognition system using agents. Agents will be used at each of the key processing steps of the system to determine the most suitable action to take based on the application, user and environment context at the time of identification. We used agent to do an adaptive score selection. Our experiments show an improvement in the system accuracy over using the traditional score fusion which is commonly used in face recognition system. Our future work is to implement and evaluate other steps of Our proposed framework.

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