Liar Detection Environment in Intelligent Manner

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Abstract— If we are going to say that a system thinks like human we must know how human thinks. The interdisciplinary field of cognitive science brings together computer models from Artificial intelligence and experimental techniques from psychology to try to build theories of the working of the human mind. So in this paper we will look the positive effects of Artificial Intelligence by designing an expert system for liar detection by capturing the criminal body language. Since crime is a harmful act against the society which considered as an offence and punished by law. As per traditional psychology criminal try to tell lie if he or she faced any critical situation in their life which become harmful for them if they tell the truth in that particular situation. But human being always acted some abnormal work during such conditions which can be some time distinguished by open eye and sometimes cannot. But if the truth is necessary for the society then the people engaged in that particular department try to get the information by using different medium like physical harassment etc. But sometime they may succeed or some time they failed to get the real information from the criminal or from the liar. So by using proposed expert system environment we will try to solve the problem of liar detection. Since AI is based on heuristic search techniques so we cannot expect 100% efficient result but we can look forwards the optimal solutions.

Keywords— Artificial Intelligence Agent, Human Psychology, Eye Movement, Movement Recognition, Voice Analysis

I. INTRODUCTION

This One of the chief distinctions between human and the rest of creation is our ability. No other creature has this ability and there's no question that this is a unique gift by God. Expert system can draw conclusion from complex relationships. Before propose an expert system we should know the structure of a typical expert system. The typical expert system consists of the following components:

- Determining Requirements
- Indentifying Expert
- Constructing expert system components
- Implementing Results
- Maintaining and reviewing system

Based on behavioural approach of human, typical psychology describes some signs of a liar. [1]That's:
• **Eye Accessing Cues Mismatch:** Based on the eye direction of people we can analysis the functioning inside the brain. For example, looking towards the upper left side means that the people are constructing an image in his or her mind while looking at the upper right side means that people are recalling an image. If someone looks towards the upper left when asked about something then he or she is probably constructing an image of the lie he or she is about to tell. This is one sign that shows that he might be lying.
• **Avoiding the Subject and Speaking Slowly:** A person who wants to hide something he or she will always avoid the subject matter and some time he use to think something and speak slowly as compared to his or her normal speak.
• **Abnormal walk:** We can also determine a liar based on his walk or movement. Through abnormal walked we can determine liar nervousness and tension. After speaking lies for some time a person become nervous, tensed and his walk become abnormal as compared to his normal walk which means that abnormally his or her walking speed becomes increased or decreased.
We absorb these approaches as our basic motives to design the liar detection environment.

II. LITERATURE SURVEY

An Artificial Intelligence agent assists human being in executing various tasks including decision making. An agent is something that acts in an environment and acts intelligently when
1. It does appropriate for its circumstances and goals,
2. Flexible to changing environments and changing goals,
3. Learns from experience, and
4. This makes appropriate choices of perceptual and computational limitations.

It seems that an agent is a system that can -
1. Think like Human
2. Act like Human
3. Think Rationally
4. Act Rationally.

Jeff Jarvis, director of the Tow-Knight Centre for Entrepreneurial Journalism at the City University of New York, wrote that "Think 'Intel Inside'. By the end of 2025, artificial intelligence will be built into the algorithmic architecture of countless functions of business and communication, increasing relevance, reducing noise, increasing efficiency, and reducing risk across everything from finding information to making transactions. [2]

Before proposing the environment we want to discuss some existing algorithms results which will we absorb to develop the environment based on behavioural approach of human being.

A. For Eye Accessing Cue Movement Detection
The EAC model used in NLP to detect the internal representational system along with mental activity of a person, based on the position of the eyes which was carried out to evaluate the theory and the results showed there is some correlation between the eye movements and mental processes. A simple and accurate eye detection method, based on which a more detailed investigation of the eye area was possible and analysis attempted to separate the horizontal and vertical position of an eye based on the iris and the sclera relative position. [3]

B. For Avoiding The Subject And Speaking Slowly
Voice recognition system performance is commonly specified in terms of speed and accuracy (subject oriented), recognition accuracy is the most important and straightforward measure of voice recognition performance. The voice algorithms in terms of detection accuracy and processing overhead and to identify the optimal voice recognition algorithm that can give the best trade-offs between processing cost (speed, power) and accuracy or relevant to the subject matters.[4]

C. For Abnormal Walk
Motion detection using temporal differencing method integrates the advantages of these all methods and presents a fast and robust motion detection algorithm. The temporal differencing method first to detect the initial coarse motion objects area. The optical flow method is applied based on the result of temporal differencing method to calculate any possible movement pixel for each frame. Because of the temporal differencing method, the calculation demand for the optical flow is reduced greatly and the moving area is still detected accurately. [5]

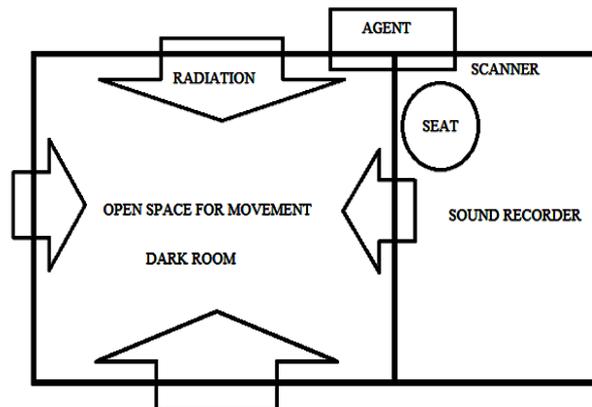## III. PROPOSED SYSTEM ENVIRONMENT

Fig1: Proposed System Environment

Methodology of proposed system Environment:
Let us consider a criminal in prism. Now the proposed system will work by marinating following condition.
1) This is a dark fully covered room with hidden radiation for movement detection and analysis that movement when he is alone or normal condition and analysis. We have not used camera for video analysis because if the criminal know there are camera he become conscious and we will not get the proper answer.
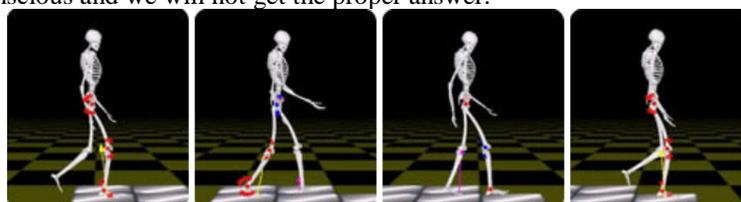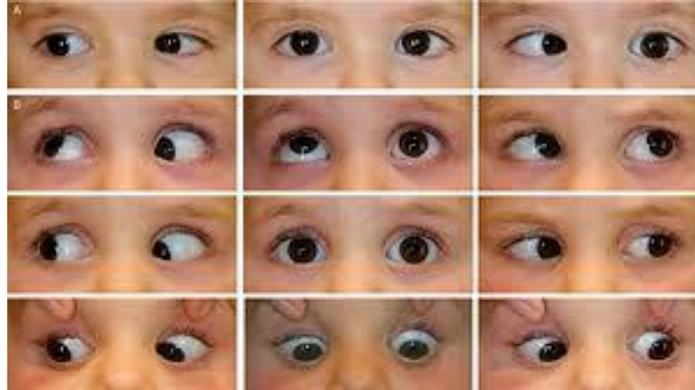

#image courtesy: www.gsport.co.jp

2) Auto generated question will ask the criminal based on crime expert suggestion and his voice will be recorded and analysis with reference to normal condition.

#image courtesy: www-03.ibm.com

3) During conversation with him the eye movement will also be captured.

#image courtesy: www.pediatriaintegral.es

4) After that by analyzing typical mathematical formula we will try to analysis whether the criminal telling truth or lie.

IV. CONCLUSIONS

After analysis various algorithm and different common expert system for human being we have proposed system model which will provide the optimal solution for detecting the person who tells lie in different prospective. The proposed model of liar detection environment is a new concept in the current scenario .As a future work we will try to implement the proposed system that will be very helpful for different agencies.

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