**ARTIFICIAL INTELLIGENCE IN DIGITAL FORENSICS**

Artificial intelligence is a very prominent field having the major focus on solving the real time complexities of the issues that could have had been raised. Digital forensics basically involves the computation of the data thus given intelligently. Using AI in solving the problems existing in digital forensics is the need of the hour.

The major issues that arise in digital forensics is the exponential storage capacity growth, the ubiquity of the data stored electronically, prevailing disparate systems and the degree of technical sophistications in order to decide the methodologies to be worked upon. The issues mentioned above could only be solved when AI sets in the process rendering reasonability and discovering potentially disparate and a large amount of data in a realistic time frame.

KNOWLEDGE REPRESENTATION

One of the most important concepts while talking about AI is knowledge representation, which involves the way of representing the information which is of our interest. Adding in the row is ontology that enables us to find the reason behind the representation so as to make it a bit more understandable. The major being currently on XML and RDF that could be as one of the methods to enhance data standardization which remains the very core of digital forensics. The future of digital forensics is standard domain ontology. Using a standard domain would enable us to share information on various tasks in digital forensics, such as the hidden information in between forensic imaging tools and also could initialize a formal framework for discussion on any digital exhibit. Further enabling us in creation of large, reusable case repository.

Using a standardized ontology would surely prove to be an asset for digital forensics so as to store and retrieve the background knowledge as per used by AI techniques.

THE REASONING PROCESS

The next major concern in AI arena of digital forensics lies the reasoning of the algorithm used. AI techniques used could be differentiated further as symbolic and sub-symbolic characters. The symbolic reasoning involves an expert system often pre-designed making the decision making process easier. Though exhibiting a drawback due to this rule of thumb algorithm which was pre-designed, error can occur in analyzation. The error can be due to the absence of the rule base. Thus limiting it’s use in digital forensics. The error could be repaired by rule base repairing, but the process is often time consuming.

Case based reasoners can be used while solving the problems associated with the symbolic reasoners, learning from their past experiences. CBR approaches to an issue in a way familiar with the expert thus reducing chances of error and solving the purpose while digital forensic investigation. This would include covering the case files with within the scenario of the case base. Though a limitation prevails of them being unsuitable for low level activities.

RECOGNITION OF PATTERNS

Involving the identification of data clusters is done by pattern recognition. The recognition system acts as a group of major classifiers, having a possible run through to all the nearby matches of the pattern and finally rendering the most appropriate as successful. Artificial neural nets and decision trees enable the identification of initial patterns thus being an important aspect in digital forensics.

DISCOVERING THE KNOWLEDGE

Data mining being the next important forensic arena of AI. Including a mixture of artificial intelligence, probabilistic techniques, statistical analysis integrated in an understandable manner. DM can be used for pattern recognition. DM basically involves the process of exploratory data analysis highlighting the relation between information and potential relationships of data and the users. The forensic community can fir sure rely on DM/KDD for initial assessment. Thus enhancing the approach use further.

ADAPTATION

ML, while referring to as forensically can be divided as the refiners and the learners. Oracle plays an important role here. It manages the patchwork in the knowledge source. Thus enabling analysis. Repairs made are done , keeping in mind the chestnut cases. ANN can help in the initial investigation of a disk under question and find the reasoning behind the same.

Implementation of AI techniques is the future of digital forensics. Though currently the techniques are at a very early stage but still the positive impacts cannot be denied. AI can automate the forensic analysis process as well as can co-work with an expert so as to render justice.