The Current Use of Artificial Intelligence in Disaster Victim Identification

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Disaster Victim Identification (DVI) is the method used to identify victims of mass casualty incidents, either man-made or natural. The guide by INTERPOL outlines protocols on DVI, comparing the Ante Mortem (AM) and Post Mortem (PM) data[1]. Traditionally, this identification was done manually by forensic experts during the operation, and partially supported by software (PLASS Data). During this process, we might find the identity of the victim or the perpetrator.

Disasters may involve multinational victims due to increased international travel, rising legal global migration, illegal migration due to conflicts, human trafficking, and the prevalence of organized crime. Collaboration among international experts speeds up the recovery and identification process, enabling families to heal and rebuild society. When there are mass victims—such as in the thousands—it prolongs the identification process and increases the cost.

Thanks to global digital advancements, where everything works faster, and with the help of Artificial Intelligence (AI), we can shorten the identification timeline.

AI encompasses techniques and methodologies designed to create intelligent machines capable of performing tasks that typically require human intelligence—such as visual perception, speech recognition, decision-making, and natural language processing. In the forensic field, deep learning using image recognition and Deep Convolutional Neural Networks (DCNN) processes large datasets. Machine learning algorithms can then make predictions or informed decisions.

AI in DVI is applied across multiple forensic domains. In Forensic Pathology and Forensic Anthropology, it supports face recognition systems, builds biological profiles, estimates age and sex, determines causes of death, and identifies injuries. Forensic Odontology focuses on Dental Age Estimation (DAE), sex determination, and demographics[4]. In Forensic Science, fingerprint, DNA, gunshot wound analysis, and other lab results become faster, more accurate, and more precise [2,3].

However, without the collection of vast datasets and the correct machine learning algorithms, AI results can be biased and discriminatory. For instance, INTERPOL's Face Expert Advisory Group has discussed and presented new facial recognition technologies, identification procedures, training needs, and collaborative efforts to develop best practice documents for member countries. Despite these advances, misidentification still occurs.

In conclusion, AI—whether semi-automated or fully automated—is applicable in daily practice. It provides fast, accurate, reliable, and objective support in Disaster Victim Identification. It reduces human error and processes large datasets efficiently. In mass disasters, where rapid identification is crucial to give closure to families and allow justice to be served, AI proves highly useful in narrowing potential matches between AM and PM data.

We still need to improve data availability, variety, liability, validity, and accuracy to prevent bias and discrimination. The development of machine learning algorithms requires further international research and collaboration to improve transparency, accountability, privacy, security, and ethics (particularly regarding data origin). Ultimately, all of this enhances the quality of victim identification. AI in DVI is a valuable support tool for forensic experts.

References:
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