New automated system IDs victims of mass disasters in minutes

November 27 2007

A new, high-tech identification system developed in Japan will improve accuracy and significantly reduce the time it takes to identify victims of mass disasters, according to a study presented today at the annual meeting of the Radiological Society of North America (RSNA).

“Families waiting to hear news regarding loved ones experience trauma while waiting for the identification process to resolve,” said Eiko Kosuge, D.D.S., dentist, radiologist and lecturer at the Department of Oral and Maxillofacial Radiology at Kanagawa Dental College in Japan. “With this new system, we can drastically cut the time and improve the accuracy of this process to help alleviate some of the emotional stress that occurs in the case of a mass disaster.”

Currently, all cases of dental identification in the wake of a mass disaster have to be handled one by one by forensic experts. After a mass disaster such as an earthquake, tsunami, plane crash or act of terrorism, forensic experts must compare each victim’s records with scores of dental records to try to make a proper identification. This can be very time consuming, taking weeks or months, and mistakes do occur.

To address this problem, Dr. Kosuge and colleagues developed a novel, automated dental radiograph (x-ray) matching system that can not only reduce the task of forensic experts but also improve the accuracy of identification. According to Dr. Kosuge, the system can reduce the amount of work required for identification by up to 95 percent and produce matches at an average rate of less than four seconds each.

The system uses a highly accurate image-matching technique called Phase-Only Correlation (POC). The technique is used to align images and measure their similarity. With POC, the system registers images, corrects distortion and calculates a matching score.

For the study, the researchers used POC to analyze dental records of 60 patients before and after dental treatment. The total number of pairs was 3,600. The system produced three candidates to match each patient's x-ray. Computation time averaged 3.6 seconds per pair. The recognition rate was 87 percent for the first candidate, increased to 98 percent for the second candidate and to 100 percent for the third. These top three candidates were then evaluated by forensic experts for the final matching decision, thus cutting the workload of the experts by 95 percent.

"Our testing has demonstrated the accuracy and efficiency of the image-matching system," said study co-author Koichi Ito, Ph.D., assistant professor at the Graduate School of Information Sciences at Tohoku University in Japan.

Drs. Kosuge and Ito predict that the system can be put into practice within a year.

"In the case of a mass disaster, the public will never know that this system was used," Dr. Kosuge said. "What they will know is that instead of waiting a month for their loved ones to be returned, they will wait only days."

Source: Radiological Society of North America

Citation: New automated system IDs victims of mass disasters in minutes (2007, November 27)

retrieved 23 April 2024 from
https://phys.org/news/2007-11-automated-ids-victims-mass-disasters.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.