

Abstract

This paper addresses the problem of creating a postmortem identification system by matching image features extracted from dental radiographs. We lay the architecture of a prototype automated dental identification system (ADIS), which tackles the dental image matching problem by first extracting high-level features to expedite retrieval of potential matches and then by low-level image comparison using inherent features of dental images. We propose the use of learnable inherent dental image features for tooth-to-tooth image comparisons. We treat the tooth-to-tooth matching problem as a binary classification problem for which we propose probabilistic models of class-conditional densities. We also propose an adaptive strategic searching technique and use it in conjunction with back propagation in order to estimate system parameters. We present promising experimental results that reflect the value of our approach.

Keywords: Image matching; Bayesian classification; Neural network training; Forensic Odontology; Dental identification.