PROBABILITY MATCH IN ODONTOLOGY IDENTIFICATION USING CLUSTER ANALYSIS AND BAYESIAN LOGISTIC REGRESSION

Graciela Molina, Servicio Médico Legal

Odontology identification is an efficient and powerful method in forensic identification. Nevertheless, probability statements from dental identification often rely on expert opinion. Matching probability is based in comparison between ante and post-mortem registry, and depends on features frequencies. However, the features distribution is not homogenous between the teeth, or independent and vary by time. Hence, the aim is to find a way of estimating the probability that both ante- and postmortem records come from the same person. A 130 patients data base, including 9 teeth features. Cluster analysis was used to find common dental patterns and demonstrated association between teeth by them common features. Using this data a Bayesian logistic regression model were trained to predict match probabilities between two dental records. To evaluate this model, a simulation data was performed using an algorithm based in teeth variability and change empiric data. Match probability prediction is specific but sensitive to variation between premortem and antemortem record, equivalent to an outdated antemortem record.