PAPER ID: 17-03-0170

Age Estimation of Asian Using Soft Computing Model Based on Bone Length of Left Hand

Mohd Faaizie Darmawan, Mohd Zamri Osman, Kohbalan Moorthy

Soft Computing & Intelligent System (SPINT), Faculty of Computer Systems & Software Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, Gambang, 26300, Kuantan, Pahang, Malaysia

Age estimation is applied in anthropology of forensic to facilitate the identification of a living person or the remains of individuals. Nevertheless, the uniqueness of the estimation models is only appropriate to a particular population. The common models are also inter and intra-observer variability where the dataset used based on qualitative which make the estimated age really depended on the expertise of the anthropologist. This paper propose age estimation focusing on Asian subjects from new-born to 18 years old using bone' length in left hand. Two soft computing models are used to develop the estimation models which are Artificial Neural Network (ANN) and Support Vector Machine (SVM). The used of length of bone is to create a new age indicator based on quantitative data and the SVM and ANN is really suitable on quantitative data. Based on results produced by these models, the SVM is the best model which is produced the lowest mean square error (MSE) value of 1.917 and 3.775 for both male and female, respectively. To conclude, the SVM is the best model in estimating the age compared to the ANN, based on length of left hand. However, the used of this model is limited only for forensic practice or experimental purpose.

Keywords: Computational Intelligent, Age Estimation, Hand Bone, Forensic Anthropology

PAPER ID: 17-03-0017

Opposition-based Whale Optimization Algorithm

Hammoudeh S. Alamri[*1], Yazan A. Alsariera[1], Kamal Z. Zamli[1]
Faculty of Computer Systems & Software Engineering, Universiti Malaysia Pahang

The Whale Optimization Algorithm (WOA) is a newly proposed metaheuristic optimization algorithm, which simulate humpback whales hunting behavior. Like other population-based algorithms, WOA generate its population randomly during the exploration and exploitation phases, which could generate values far from the optimum solution or stuck the exploration around local optima. In order to improve solution accuracy and reliability, this paper proposes a new algorithm based on WOA. The new algorithm called Opposition-based Whale Optimization (OWOA). The OWOA use the Opposition-based method to enhance Whale Optimization Algorithm (WOA) performance. The OWOA looks for the solution in the opposite direction of suggested values to test if the opposite select has better solution. The OWOA is tested and compared with the original algorithm WOA and other metaheuristic methods. The benchmark results prove the efficiency of the OWOA being more efficient than WOA.

Keywords: Metaheuristic, Optimization, Whale Optimization Algorithm, Opposition-based Learning, OBL.