

Suitability and Precision of Xerographic and Computer-Assisted Methods

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Abstract

This study was to compare the suitability and precision of xerographic and computer-assisted methods for bite mark investigations. Eleven subjects were asked to bite on their forearm and the bite marks were photographically recorded. Alginate impressions of the subjects' dentition were taken and their casts were made using dental stone. The overlays generated by xerographic method were obtained by photocopying the subjects' casts and the incisal edge outlines were then transferred on a transparent sheet. The bite mark images were imported into Adobe Photoshop® software and printed to life-size. The bite mark analyses using xerographically generated overlays were done by comparing an overlay to the corresponding printed bite mark images manually. In computer-assisted method, the subjects' casts were scanned into.

Keywords: Computational constructs; Molecular computation; Strand displacement

Introduction

The bite mark analyses using computer-assisted overlay generation were done by matching an overlay and the corresponding bite mark images digitally using Adobe Photoshop®. Another comparison method was superimposing the cast images with corresponding bite mark images employing the Adobe Photoshop®CS6 and GIF-Animator®. A score with a range of 0–3 was given during analysis to each precision-determining criterion and the score was increased with better matching.

The Kruskal Wallis H test showed significant difference between the three sets of data ($H = 18.761, p < 0.05$). In conclusion, bite mark analysis using the computer-assisted animated-superimposition method was the most accurate, followed by the computer-assisted overlay generation and lastly the xerographic method. The superior precision contributed by digital method is discernible despite the human skin being a poor recording medium of bite marks. It is generally accepted that the geomagnetic K indices derived by experienced observers are of great value.

Discussion

The interactive method (IM) based on the traditional hand-scaling methodology is tested in this study. The tests are performed utilising the data from the Hurbanovo and Budkov magnetic observatories.

These data include both digital records of the geomagnetic field and hand-scaled K indices that had been derived by experienced observers.

The authentic K indices from Hurbanovo cover the year 1997 and the same kind of data from Budkov covers the years 1994–1999. In addition to these data, hand-scaled K indices are used which were derived by the experienced observer from printed digital magnetograms for both of the observatories for the years 2000–2003. The results of this study indicate that for high values of K indices (the values being at least 5) the tested method follows the traditional hand-scaling better than the widely used computer methods FMI and AS. On the other hand, for the K indices less than 5 the tested method turns out to be the worst when compared with the FMI and AS methods. For very low geomagnetic activity (K-index values equal to 0) the performance of the tested method is comparable to the two computer methods [2]. Computational algorithms can be described in many methods and implemented in many languages. Here we present an approach using storytelling methods of computer game design in modeling some finite-state machine algorithms and applications requiring user interaction. An open source software Twine is used for the task. Interactive nonlinear

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can detect general objects, and is not restricted to vehicles, objects or pedestrians. It has provided good results along with high accuracy and reliability, which it is accurate enough to provide a warning to the driver when a collision is imminent. An improved polygon-based method is proposed for sub wavelength pixel pitch computer generated holograms (CGHs). By employing the basic principle of image-plane holograms, and by optimizing the parameters, objects are reconstructed with high quality from the CGHs whose pixel pitch is smaller than wavelength. It is believed that the proposed method is potentially promising for future large viewing angle holographic 3D displays. Many very difficult problems in applied mathematics and other scientific disciplines cannot be solved without powerful computational systems, such as symbolic computation and computer graphics. In this paper we construct two new families of the fourth order iterative methods for finding a multiple real or complex zero of a given function. For developing these methods, a recurrent formula for generating iterative methods of higher order for solving nonlinear equations is applied and implemented by symbolic computation through several programs in computer algebra system Mathematical. Symbolic computation was the only tool for solving the considered complex problem since it provides handling and manipulating complex mathematical expressions and other mathematical objects (Figure 1).

The properties of the proposed rapidly convergent methods are illustrated by several numerical examples. To examine the convergence behavior of the presented methods, we also give the dynamic study of

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