

NEW COMPUTER PROGRAM “FACE-ON-FACE” AS A NEW PRACTICAL ANTHROPOLOGICAL VIRTUAL INSTRUMENT

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The program Face-on-Face was developed for optimization of creating of composite portraits (CP) (of the face and body) according to F. Galton by means of new digital images. Composite portrait is a kind of cognitive tool that allows visualizing the integrated variability of morphological characteristics of the human face – in sex, age, race (ethno-territorial) aspects. An algorithm of creating portraits consists of the following: first, the average interpupillary distance for the entire sample (in pixels) is calculated, then all of the individual images are restricted (reduced or increased, respectively) to found the average interpupillary distance and simultaneously stretch or shorten in height, reaching the average distance between an oral point and a horizontal line passing through the pupils. These transformed images are sequentially superimposed on each other. Color of a pixel at each point is the average of all pixels of the points with all the images. The sequence of the overlay does not affect the final image. Due to the transformation of each image into a mathematical model the combining process is fast enough. Therefore, CP could be created for 10–15 minutes depending on the image resolution. A tool “ruler” allows to take measurements relying on the bar existing in the frame scale. The distance in pixels is converted to millimeters. Tool “symmetry” allows to slice an image of the face (or of the body) by sagittal line and then to “glue” the halves – left with left, right with right. The experience of creating of CP relying on three points in the three classic standards – “full face”, “3/4”, and “profile”, yielded unique CPs of Russian Altai children, some of the peoples of northern Eurasia, Negroid of East Africa, etc. We received an interesting result of CP generated with 27 base points. The developed model can be used by researchers, museum staff, forensic experts and other specialists.

Key words: *anthropological photography, composite portrait, computer software, appearance features, visualization*

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IDENTIFICATION FROM HUMAN BITE MARKS: AN EXPERIMENTAL STUDY

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Identification from human bite marks is one of the major issues which forensic sciences - forensic anthropology and forensic dentistry - are interested in. According to the American Board of Forensic Odontology (ABFO), standard studies include: tooth structure of suspects, collecting information if there is any possibility to reach DNA, taking photo of bite marks, creation of dental model of the suspect and applying methods for the bite marks analysis. The purpose of the present experimental study is to investigate the bite marks on various materials created by adult volunteers, stating if the elimination or the prevision of suspects can be made or not. A total of 20 adult volunteers (10 from each sex, aged between 20–45 years) were asked to bite styrofoam, apple, cucumber, cheddar cheese, transparency, and their upper arm (biceps). According to the ABFO standards, the photographs were taken showing the intraoral structure and bite marks from various materials, and the dental plaster models were created and scanned. Transparent coating was applied using Adobe Photoshop CS4 Extended software, and comparisons were made. According to the results, comparison between transparent coatings obtained from dental plaster models and bite mark materials of styrofoam (75% of accuracy/true match on the both upper and lower jaws), cheddar