Technical notes

Image overlay using alpha–blending technique

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Comparison of two aligned studies is enabled usually, next to crosshair, also by special tools for image overlay. Some of them (contour mode, sliding window, chess mode) are discussed in [1]. These tools replace part of one study by the other study but the comparison is possible only part-by-part. Therefore there is a need for other more advanced techniques which allow easy, complete and user-friendly comparison. We can assume that each study represents a separate layer of the image and the task is to display both layers at once. The computer graphics technique which allows displaying of more layers at once in one picture is called alpha blending. Alpha blending is the process of combining two colours to create a third colour. When applied to every pixel in an image, the result is a merged image. In up-to-date software this technique is used for image fusion.

A program MABViewer was written in Borland C++ Builder 4.0, originally to have the possibility of simultaneous evaluation of emission and transmission PET scans and their overlay. Comparison of emission scan with the transmission scan can help in the localisation of tumour in lung area (in/outside the lung), even though the border of the lungs in the transmission scan is very fuzzy. Later on the program was modified to read also Interfile 3.3 format [2] to overlay any aligned data.

The program blends the layers in the way that the resulting pixel colour is calculated as a linear combination according to the equation.

Result $= \alpha_1 \times \text{Img}_1 + (1-\alpha_1) \times \alpha_2 \times \text{Img}_2 + (1-\alpha_1) \times (1-\alpha_2) \times \text{B}$

where α_1, α_2 are the α-channels of first and second image Img_1, Img_2 (the α-channels may be set between 0 and 1). B is the background colour which may be chosen. By smooth change of the α-channels the user gets the information from both studies.

The program requires Windows 95 or higher, and can read the data in Interfile 3.3 format and also ECAT matrix 7.x (CTI/ /Siemens) format. MABViewer is free software and can be downloaded from http://www.sweb.cz/nukmed.

References

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2. Todd-Pokropek A, Cradduck TD, Deconinck F. A file format for the exchange of nuclear medicine image data: a specification of Interfile version 3.3. Nucl Med Commun 1992; 13: 673–699.

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