apply IIR filters to RI image processing, the linearity of the applied filter is necessary. The method of time reverse was used to obtain linearity of IIR filters in our study. Simulation study proved that linearity, which was adequate for RI image processing, was obtained using the method of time reverse. The framed IIR low-pass filters with arbitrary cut-off frequency were applied to the phantom and the clinical studies, which revealed that the resultant images had direct connection with the magnitude response or cut-off frequency of the filter and that the linearity was enough gained for phantom and clinical application.

IIR filters of Butterworth type are easily designed with arbitrary cut-off frequency and will be effectively used in other radiological studies.

Computer Processing of RI Images Using Digital Filter

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A digital filter method was designed for the elimination of “blur” substantially involved in RI images and clinical application of this method were performed.

For the blur restration, a differential operator method was adapted. In this mathematical procedure, the point spread function, i.e. the transfer function of the scanning system was approximated by a Gaussian function, which was then brought to Fourier Transformation.

As the jw in frequency domain coincided with the differential operator, the inverse of the transfer function was presented in a series of differential expressions by a Taylor development.

Based on the initial two terms, the differential operator for the image restoration was constructed as a digital filter.

Effectiveness of this digital filter method was similar to the previous interactive method and the shortness of computing time and the smallness of occupying core memories were suitable points for an on-line minicomputer system.

In conclusion, blur restoration using digital filter method was proved to be useful and available for routine work.