

Computed Tomography (CT) image reconstruction using Matlab programming

Siahaan, Ferdinan Manuel, author

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Abstrak

X-ray computed tomography (CT) has been playing an important role in current medical practice for diagnostic procedure. Beside its delicate technology, the 'hidden' software of CT image reconstruction has contributed almost half of total cost of a CT-scanner unit. Since Algebraic Reconstruction Technique (ART) is a basic to understand an iterative method of CT image reconstruction algorithm, and since it is difficult to find a clear description of fan beam ART algorithm in university literatures, it is important to develop an own algorithm and to begin a basic systematic research of this iterative method. After a long term of trial and error work, the research had succeeded in developing an ART algorithm for third generation CT image reconstruction. By comparing the result of the research with more popular technique like Filtered Back Projection (FBP), the algorithm has been proved applicable to reconstruct a low dimension object matrix (32x32 and 64x64). By the resulted computer program, then basically a simple and low cost third generation CT-scanner can be designed for medical physics or biomedical imaging research. Finding a way of shortening the massive number of iterations process then, will be able to open the possibility of using the software for higher object matrix dimensions.