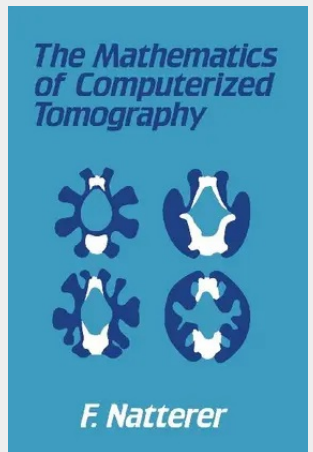


The Mathematics of Computerized Tomography

By computerized tomography (CT) we mean the reconstruction of a function from its line or plane integrals, irrespective of the field where this technique is applied. In the early 1970s CT was introduced in diagnostic radiology and since then, many other applications of CT have become known, some of them preceding the application in radiology by many years. In this book I have made an attempt to collect some mathematics which is of possible interest both to the research mathematician who wants to understand the theory and algorithms of CT and to the practitioner who wants to apply CT in his special field of interest. I also want to present the state of the art of the mathematical theory of CT as it has developed from 1970 on. It seems that essential parts of the theory are now well understood. In the selection of the material I restricted myself - with very few exceptions - to the original problem of CT, even though extensions to other problems of integral geometry, such as reconstruction from integrals over arbitrary manifolds are possible in some cases. This is because the field is presently developing rapidly and its final shape is not yet visible. Another glaring omission is the statistical side of CT which is very important in practice and which we touch on only occasionally.

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