



## Journal Menu

- Abstracting and Indexing
- Aims and Scope
- Article Processing Charges
- Articles in Press
- Author Guidelines
- Bibliographic Information
- Contact Information
- Editorial Board
- Editorial Workflow
- Reviewers Acknowledgment
- Subscription Information

- Open Special Issues
- Published Special Issues
- Special Issue Guidelines

Call for Proposals for  
Special Issues

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## Research Article

## Level Set Method for Positron Emission Tomography

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## Abstract

In positron emission tomography (PET), a radioactive compound is injected into the body to promote a tissue-dependent emission rate. Expectation maximization (EM) reconstruction algorithms are iterative techniques which estimate the concentration coefficients that provide the best fitted solution, for example, a maximum likelihood estimate. In this paper, we combine the EM algorithm with a level set approach. The level set method is used to capture the coarse scale information and the discontinuities of the concentration coefficients. An intrinsic advantage of the level set formulation is that anatomical information can be efficiently incorporated and used in an easy and natural way. We utilize a multiple level set formulation to represent the geometry of the objects in the scene. The proposed algorithm can be applied to any PET configuration, without major modifications.

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