

# Newton Trust-Region Method for a Level-Set Based Mumford Shah Model

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A Mumford-Shah Model for the identification and segmentation of a piecewise constant distributed parameter in an X-ray tomography setting is considered. A reduced formulation of the variational problem is derived. The numerical treatment of the resulting shape optimization problem is main topic of the talk. First and second order shape derivatives are calculated. A trust region approach is used for the construction of a descent direction and the level-set framework is applied for the update of the shape variable. Numerical comparisons with gradient-type algorithms are presented.