REGULARIZED KALMAN ALGORITHM FOR DYNAMIC SPECT RECONSTRUCTION

JOE QRANFAL

Department of Mathematics
Simon Fraser University
Burnaby BC, Canada
jqranfal@sfu.ca

ABSTRACT. Single photon emission computed tomography (SPECT) is a nuclear medicine imaging technique that is extensively used for clinical diagnosis. Classical SPECT reconstruction algorithms assume that the activity does not vary in time. This is not always true in practice. For instance, when we study Teboroxime cardiac images, the activity changes in time. Thus arises the need of exploring dynamic SPECT. We explore a Kalman reconstruction approach with spatial regularization to estimate the time varying activity. While other methods assume a priori knowledge about the activity behavior, Kalman assumes little. We formulate a state-space model of this ill-posed inverse problem which we solve using the optimal Kalman filter and smoother. Numerical results are provided.

This is a joint work with Germain Tanoh, Manfred Trummer, and Anna Celler.