ON USE OF THE KALMAN FILTER FOR SPATIAL SMOOTHING

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Abstract. A state-space model to perform discrete thin plate smoothing for data on a two-dimensional rectangular lattice is proposed with the use of the Kalman filter. The use of the Kalman filter reduces computational difficulties in the maximum likelihood estimation of a smoothing parameter. A procedure to reduce computational difficulties in the estimation of trend is given also. Numerical illustration is provided using two sets of artificial data.

Key words and phrases: Discrete thin plate smoothing, image analysis, Kalman filter, likelihood, spatial statistics, state-space approach.