1. A Weighted Loss Function Approach to the Multivariate RPD Problem

As products/processes often possess several quality characteristics, Robust Parameter Design (RPD) problems are likely to be dealt with by considering multiple responses. Several researches have proposed solutions to this problem by using loss function. A weighted loss function approach to make a good trade-off between bias and variation components of the objective function built on these researches is suggested in this paper. In addition, an algorithm of the weight parameter is also proposed, which can be used when the prior information is vague In case that no prior experience can clarify the relative importance between bias and variation, we further suggest a data driven approach to determine the weight parameter.

2. Bayesian Estimation of Two value Distribution Parameter under a Weighted Balanced Loss Function

In the paper through comparing all sorts of distributed parameter estimation. In different papers. This paper considers a new loss function from goodness of fit. This paper mainly discussed the Bayesian estimation of Pareto distribution parameter and Pascal distribution parameter, and had proven that this estimation was admissible with given $q(\theta)$. General Bayes estimation are under symmetrical loss .In the paper discussed the Bayes estimation of two different kinds of distribution---Pareto distribution parameter and Pascal distribution parameter under the weighted balance loss with given $q(\theta)$, and proved that the estimation is the admissible.

3. Image Quality Comparison of Reconstruction Using Total Variation-Based Regularizers.

Regularization methods are commonly used for noise reduction in SPECT image reconstruction. Total variation (TV) is a well-accepted method for suppressing noise while preserving edges. However, using TV as regularizer implies that the image is piecewise constant. Usually this is untrue in clinical settings and leads to stair-casing artifacts. High-order TV (HOTV) and infimal-convolution TV (ICTV) are proposed here to avoid such artifacts. Previously, we proposed the preconditioned alternating projection algorithm (PAPA) to address the non-differentiability of the TV regularizer. Here we generalize PAPA to solve for these regularizers, and apply them to reconstruction of Monte Carlo-simulated SPECT data.

4. IMAGE REGISTRATION USING AN EXTENDABLE QUADRATIC REGULARISER

Image registration algorithms are widely used in medical imaging to spatially align anatomical features. This work investigates the regularisation of the registration transformation by unification of the standard diffusion equation regulariser with the standard curvature regulariser. A variational non rigid registration scheme is employed with periodic boundary conditions and tested over a range of regularisation parameters. A variable regularisation algorithm is also proposed that automatically adapts the regularisation as the registration progresses. This work has developed a method for extending the quadratic family of image registration regularisers used in medical image registration. Increasing the range and flexibility of the regularisation term has shown the potential for improvements in registration performance, which in combination with other multi-resolution strategies could be extremely effective.

BY – Abhishek Sharma
Roll no. – 15MI435