SMControl User's Manual

This MATLAB program accompanies the paper "Setup Adjustment of Multiple Lots using a Sequential Monte Carlo Method". It assists users to adjust a process that produces parts in batches or lots in which there is the possibility of a setup error with each new lot.

The MATLAB code includes the following routines:

- `SMControl.m`: this is the main program;
- `log_kitigawa_resample_move`: this routine performs a "rejuvenation" step of the particles in the distributions by means of a resampling-kernel smoothing scheme described in reference [1];
- `randnorm.m`: function that generates mutivariate normal random numbers.

To use the program, users need first to change the following in the `SMControl.m` program:

1. the number of lots (I) and number of parts per lot (J);
2. the parameters of the prior distributions for the part to part and lot to lot variances (Lognormal distributed);
3. the parameters of the prior distribution of the lot to lot means (normal distributed).

From MATLAB, run the `SMControl.m` program. The program will recommend a level for the controllable factor at each part/lot. Users need to enter the observed deviations from target of the quality characteristic. This will be repeated for all $I \times J$ parts.

References

[1] Balakrishnan S., Madigan D. A One-Pass Sequential Monte Carlo Method for Bayesian Analysis of Massive Datasets. 2004. Technical Paper, http://www.stat.rutgers.edu/~madigan/papers/.