User's Manual for Adaptive Deadband Adjustments

The objective of this MATLAB-based software is to assist users to adjust a production process, in which the mean of the quality characteristic can drift randomly, in the presence of a fixed adjustment cost. The discussion on this method can be found in paper "Adaptive Deadband Control of a Drifting Process with Unknown Parameters".

The Matlab codes in this package include:

- **AdaptiveAdjust.m**: The main code;
- **log_kitagawa_resample_move_Deadband.m**: Function for conducting the "rejuvenation" of the distributions;
- **randnorm.m**: Function for generating multi-variate normal random numbers.

To use this software, the user needs to specify the length of the process and the prior distributions of the process parameters in the file AdaptiveAdjust.m. These include:

- N: number of stages in the process;
- c: relative fixed adjustment cost;
- $mean1$, $ratio1$: variables to determine the prior distribution of σ_ϵ^2, which is a log-normal distribution. The mean of the prior distribution is given by $mean1$ and the variance is given by $mean1^2 \times ratio1$.
- $mean2$, $ratio2$: variables to determine the prior distribution of σ_ν^2, which is a log-normal distribution. The mean of the prior distribution is given by $mean2$ and the variance is given by $mean2^2 \times ratio2$.

After the above variables are set up, save and run AdaptiveAdjust.m in the MATLAB environment. Users can follow the steps given by the software to operate the process. During the procedure, users will be asked to enter the observation of the quality characteristic $Y(i)$ at each stage.