Supplementary file for “Service failure monitoring via multivariate multiple linear regression profile schemes with dimensionality reduction”

Using airline online reviews on TripAdvisor, we compared the eight proposed MMLRP-based schemes, six with dimensionality reduction (PCA-I, PCA-M, ICA-I, ICA-M, LAS-I, and LAS-M) and two without dimensionality reduction (RAW-I and RAW-M) in the case study. The letter I denotes the IC covariance and the letter M denotes the mixed covariance used in the statistic. To make a comprehensive comparison, we considered two cases with a small or large size of the test sample and further examined whether the choice of affected the results of the case study.

1. The first case with a small sample size ()

As shown in Figures 1-2, when setting a small size of the test sample (i.e., ), the proposed schemes with performed as well as their counterparts with . There was one particular case for the RAW-M scheme. The RAW-M scheme with detected the first anomaly in the 27th test sample, one test sample earlier than the RAW-M scheme with . The performance difference between them is small. Therefore, having has a negligible impact in our case study.

1. The second case with a large sample size ()

From Figures 3-4, when setting a large size of the test sample (i.e., ), the proposed schemes with and their counterparts with detected the first anomaly in the same sample. It indicates that having has no impact in our case study.

The comparison shows that having different smoothing parameters within a small range has negligible or no impact in our case study.

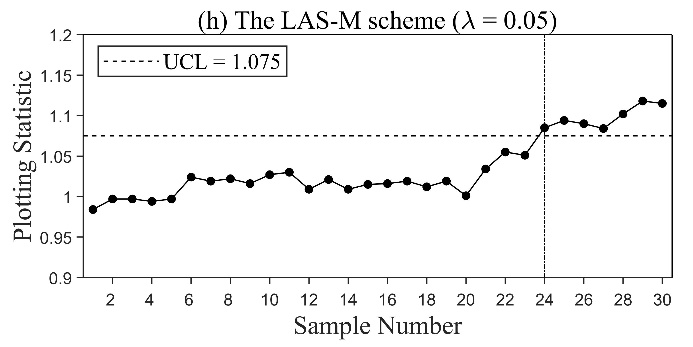
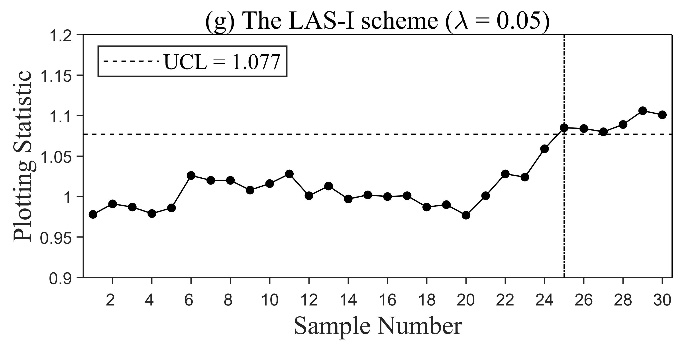
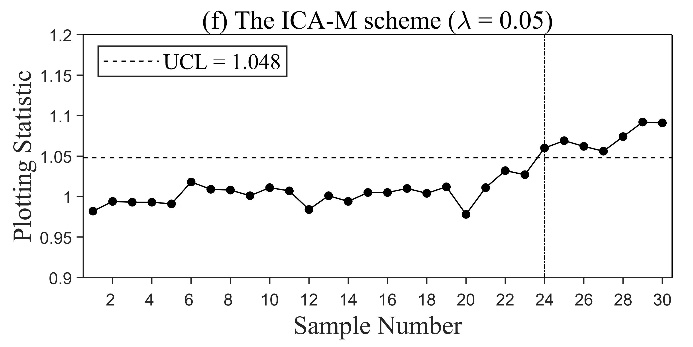
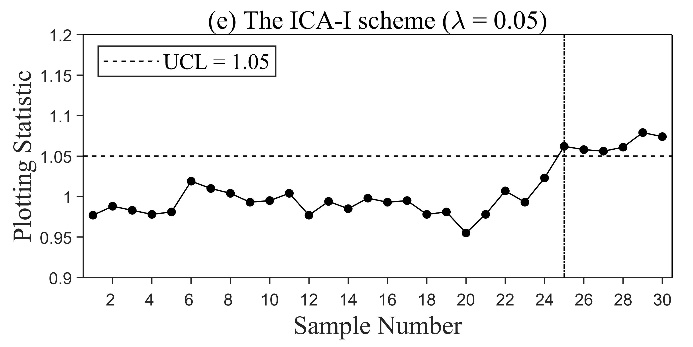
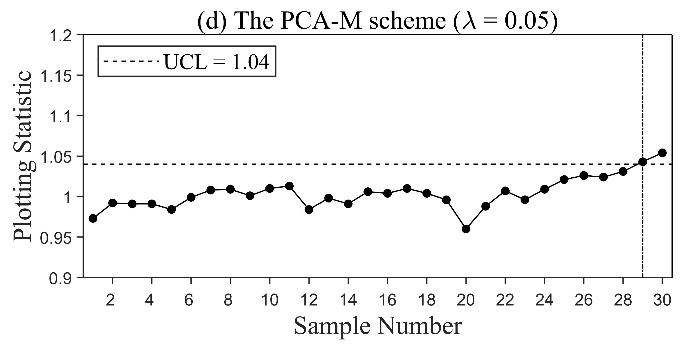
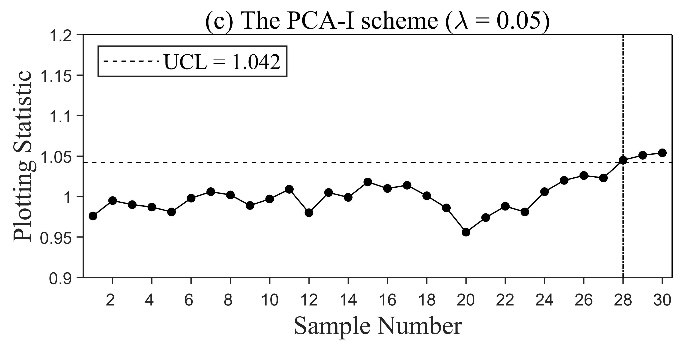
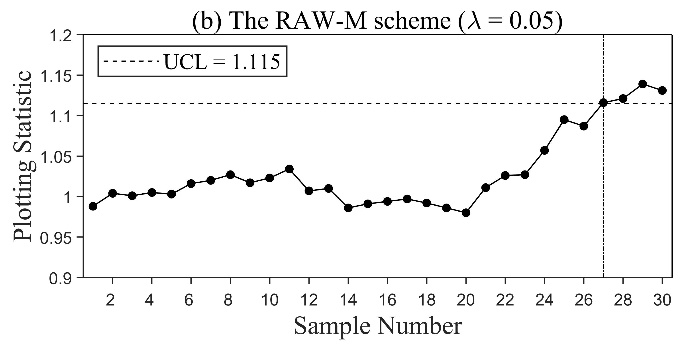
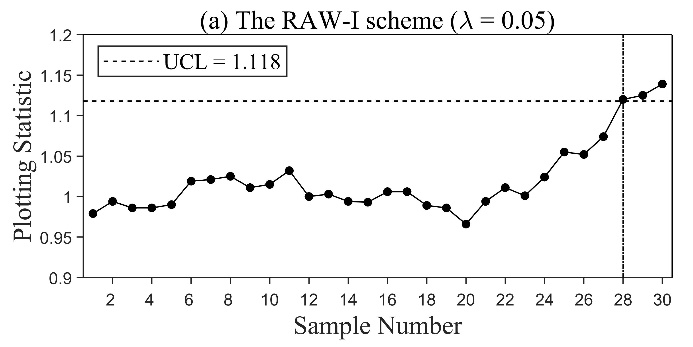


Figure 1. The first case: monitoring passenger complaints using the proposed schemes with and .

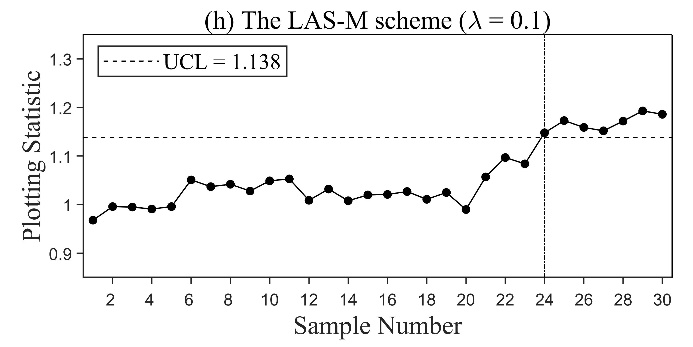
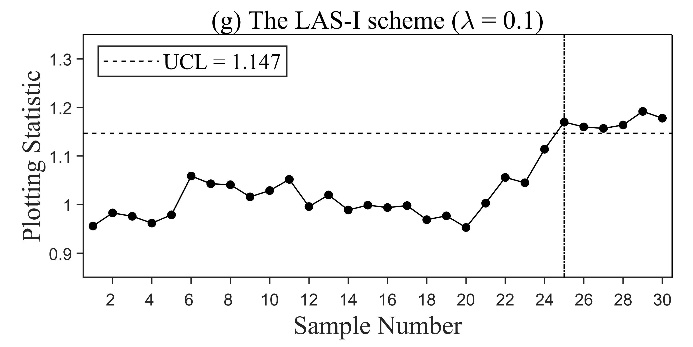
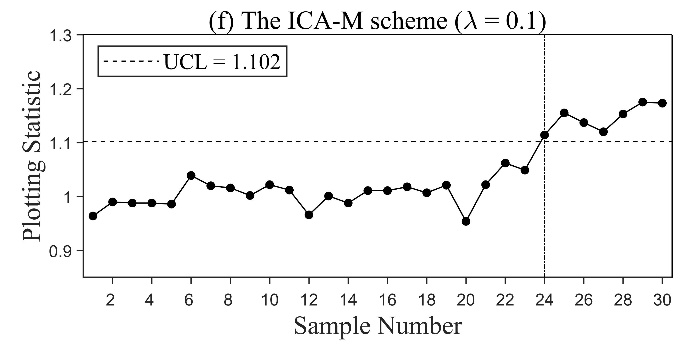
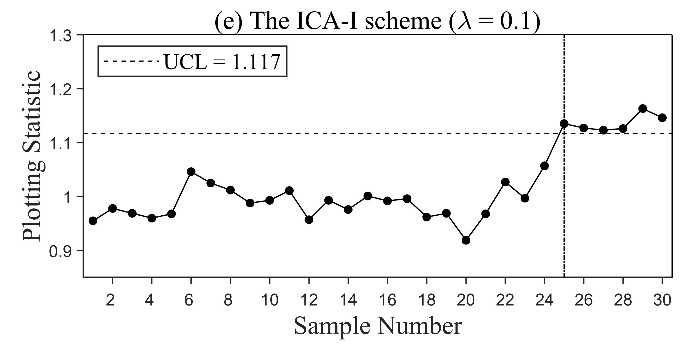
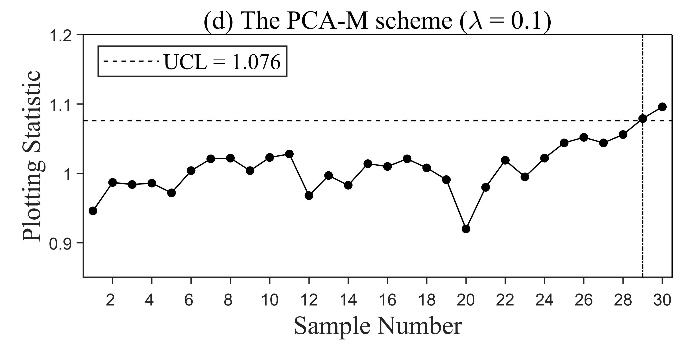
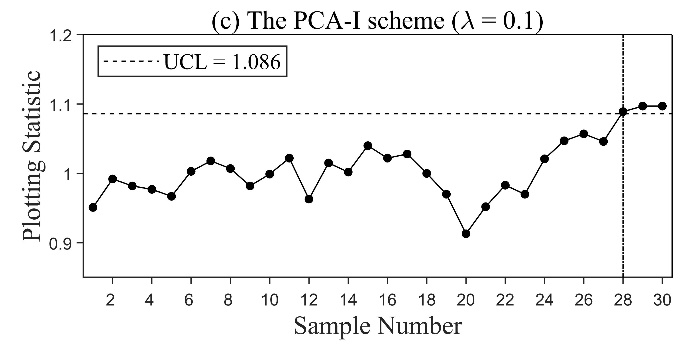
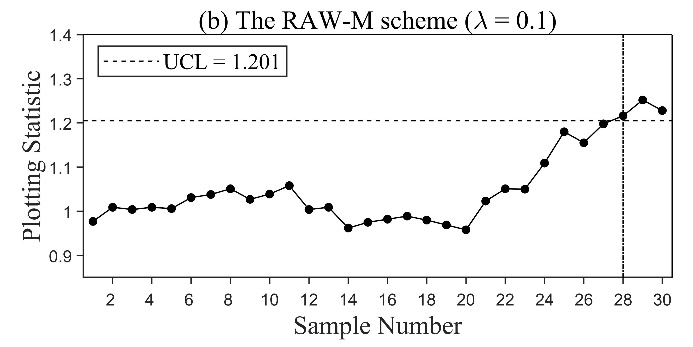
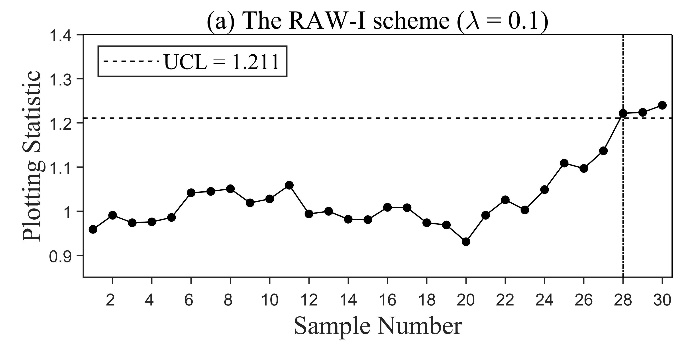


Figure 2. The first case: monitoring passenger complaints using the proposed schemes with and .

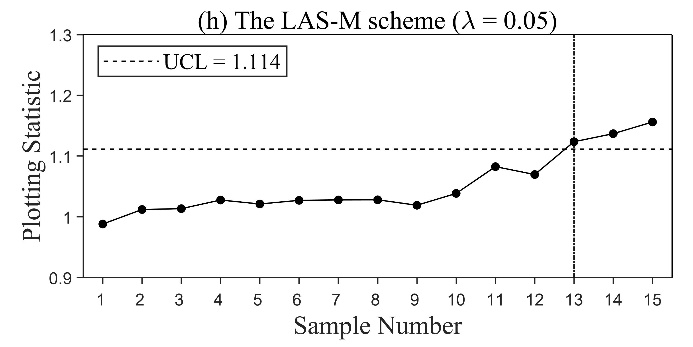
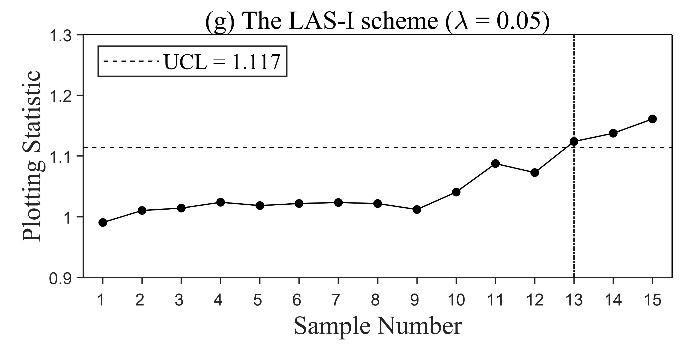
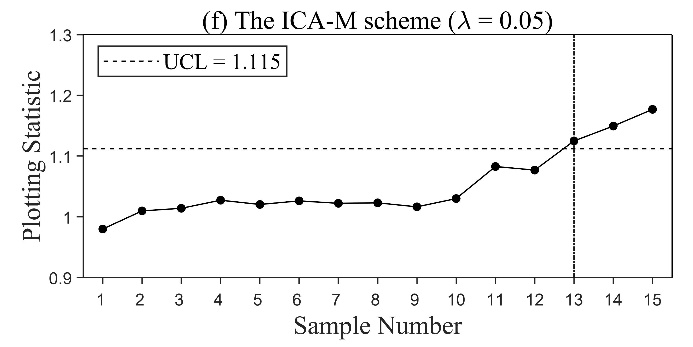
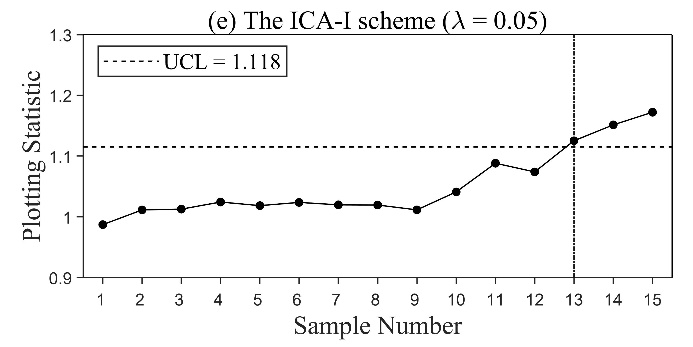
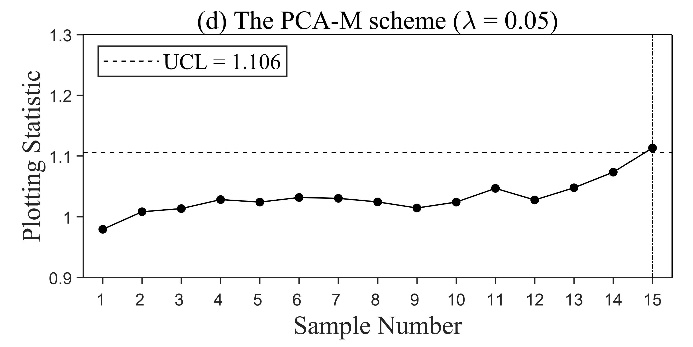
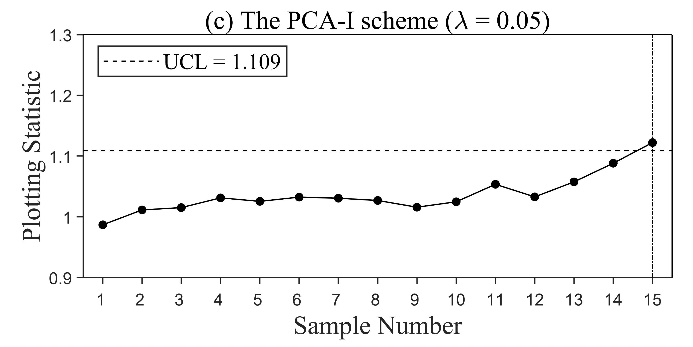
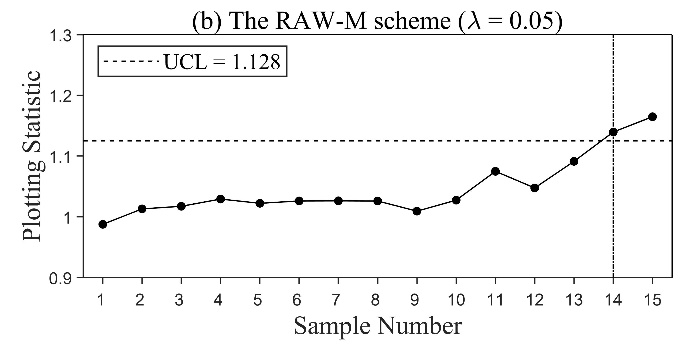
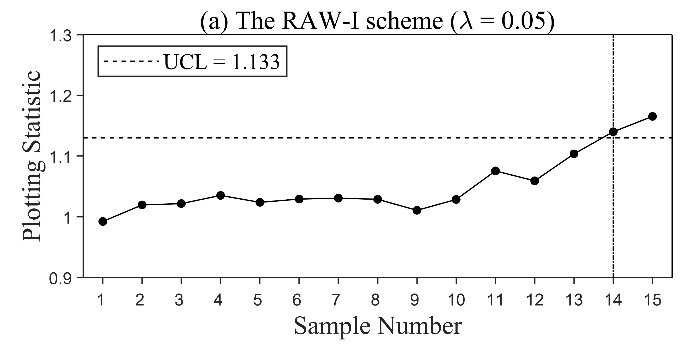


Figure 3. The second case: monitoring passenger complaints using the proposed schemes with and .

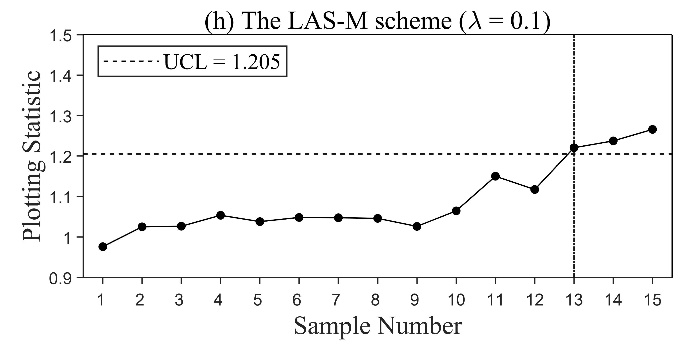
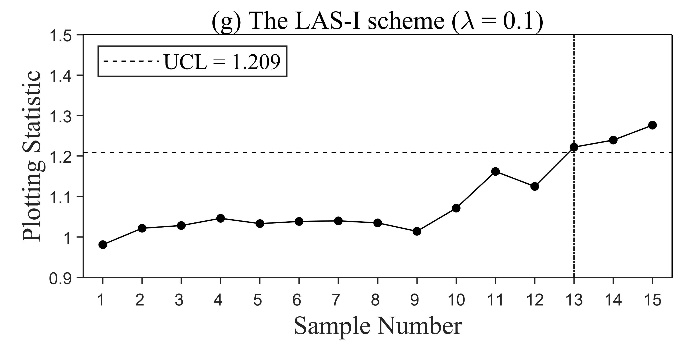
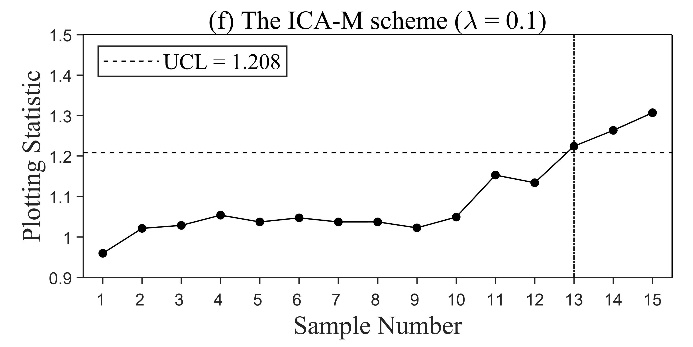
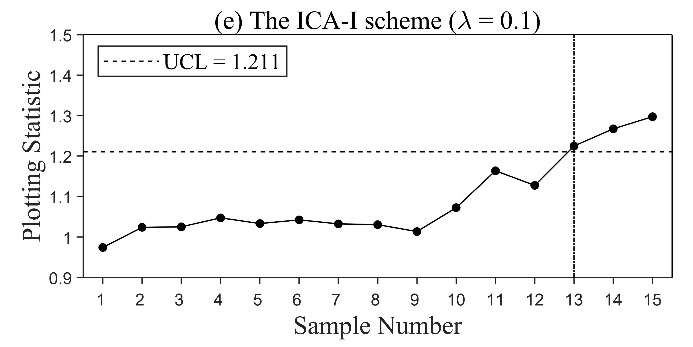
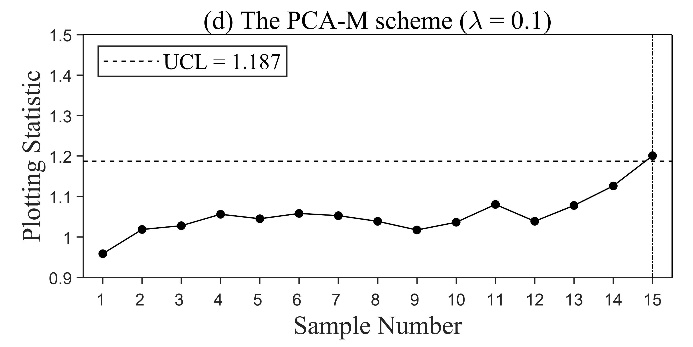
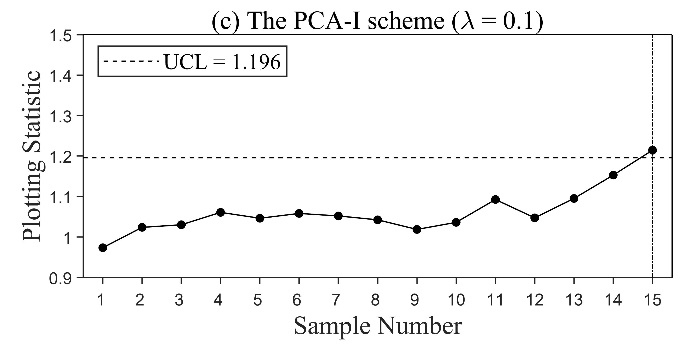
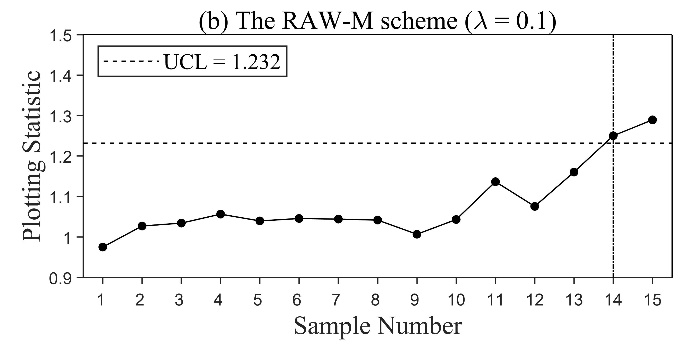
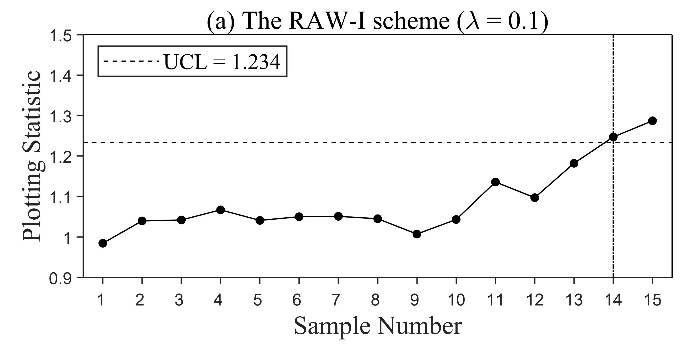


Figure 4. The second case: monitoring passenger complaints using the proposed schemes with and .