

Dear readers,

In this package, there are two files, i.e., (1) Code for generating bandwidth via R; and (2) Main code for the KDE-based framework.

For the (1) Code for generating bandwidth via R, there is a compiled package, namely, `ks`, which is required to insert into the R language environment to generate the optimal bandwidth for the proposed KDE-based framework.

For the (2) Main code for the KDE-based framework, it consists of the main codes used in the proposed total KDE-based framework. These codes can be compatible in Matlab software. To be specific, the file ‘Fragility-calculation-KDE.m’ is adopted to generate the KDE-based fragility results (herein we only give the variable of structural demand; and the same code can be used when the variable is changed to the loss ratio); the file ‘Fragility-plot-KDE.m’ and ‘Damage state-plot-KDE.m’ are adopted to plot the KDE-based fragility and damage state results; the file ‘Loss calculation combination.m’ and ‘N-year for expected loss.m’ are adopted to generate the KDE-based loss results; the file ‘Plot all the loss.m’ is adopted to plot the KDE-based loss results; the file ‘Plot Joint-PDF.m’ is adopted to plot the KDE-based joint PDF of variables; and the file ‘bar_collapse-comparison.m’ and ‘bar_total-comparison.m’ are adopted to generate bar charts for collapse loss and total loss in the proposed KDE-based framework.

Moreover, we have also added a ‘mat’ file, namely, expected loss-data for collapse and total.mat, which can be directly opened in Matlab software. This file gives all the expected loss-data for collapse and total conditions in the example of this paper. To be specific, the file ‘IM_level’ denotes the intensity level used in the example; the file ‘y_KDE_200_collapse’ and ‘y_KDE_200_total’ denote the collapse and total loss ratio for the KDE approach with only 200 points; the file ‘y_LSR_200_collapse’ and ‘y_LSR_200_total’ denote the collapse and total loss ratio for the LSR approach with only 200 points; the file ‘y_LSR_4000_collapse’ and ‘y_LSR_4000_total’ denote the collapse and total loss ratio for the LSR approach with 4000 points; and the file ‘y_MCS_collapse’ and ‘y_MCS_total’ denote the collapse and total loss ratio for the MCS approach with 100000 points.