The shared codes and original vibration data are supplementary data for Ref. [1].

**Notes for original data in the “Exp 20130904” folder**

* Data sample rate is 20 kHz
* 1 stands for stable tests; -1 stands for unstable tests
* Part of original data used in Ref. [1] is provided for demonstration. The authors have no plan to share all original data in Ref. [1].
* Each original data file contains 5 components. Each component corresponds to one column. The first column is time; The 2nd, 3rd and 4th ones are acceleration signals in x, y and z, respectively; The last column is RMS of acoustic emission

**Notes for the matlab codes and data**

* s\_8\_1\_1\_avgFFT.m is used to examine the effect of different tests selected on the synthetized FFT in Figs 7 and 8. s\_8\_1\_1\_avgFFT\_Fig1.fig and s\_8\_1\_1\_avgFFT\_Fig2.fig are outputs from s\_8\_1\_1\_avgFFT.m.
* s\_8\_3\_1\_FeasExt.m is used to extract the image features from all original data
* ROC\_FeasSpace.m is used to assess the feature performance (Figs. 10 and 11 in Ref. [1])
* FstSt2013\_section831\_Ver.mat and label\_Acc2013\_m1Ver1.mat are the image features and test stability label, respectively.
* ROC.m and fft\_yun.m are not codes developed by the authors.

**Reference**

[1] Chen Y, Li H, Hou L, Bu X. Feature extraction using dominant frequency bands and time-frequency image analysis for chatter detection in milling. Precision Engineering, 2019, 56: 235-245.