Supplementary Material

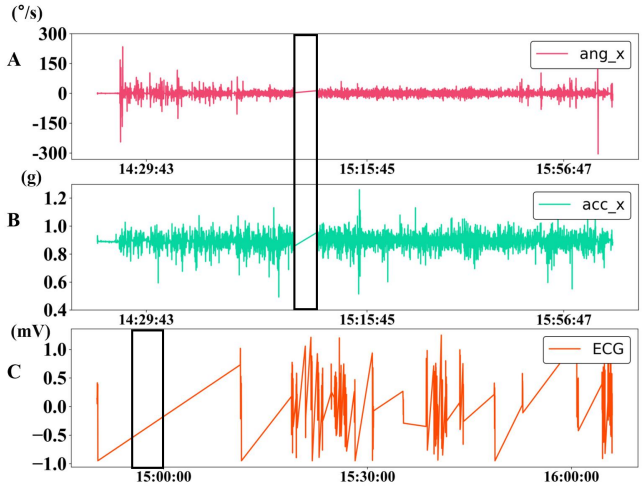

Fig. S1. Three types of signals from the same trip. (A) shows the variation of the angular velocity signal in the x-axis during the trip. (B) shows the variation of the acceleration signal in the x-axis during the trip. (C) shows the driver’ s ECG signals during the trip. The black boxes indicate the signal loss due to power outage or network signal loss.

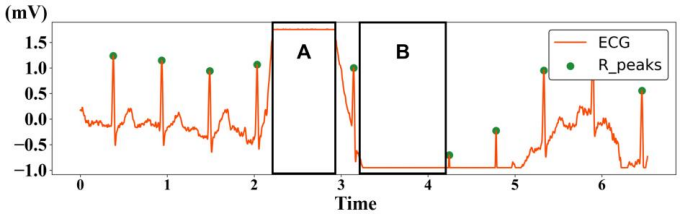

Fig. S2. ECG Signal with Top and Bottom Truncation. The figure shows the actual effect of ECG signals collected during a driver's trip with unstable steering wheel grip. The signals in box A indicate truncation at the top, while the signals in box B indicate truncation at the bottom.

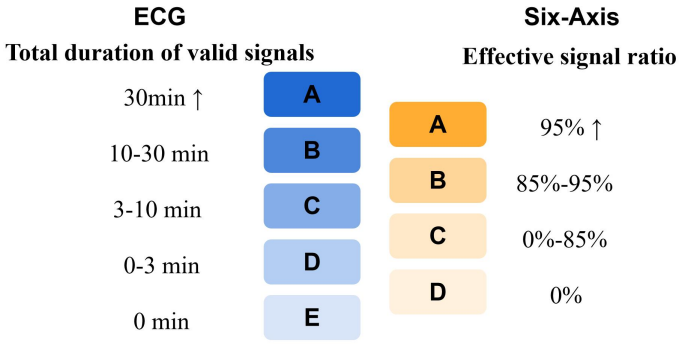

Fig. S3. Data integrity partition evaluation criteria. For ECG signals, grade A represents that the total duration of effective ECG signals in a journey is more than 30 minutes, grade B represents between 10 and 30 minutes, grade C represents between 3 and 10 minutes, grade D represents less than 3 minutes of effective signal, and grade E represents complete signal loss. For the six-axis motion signals, grade A represents that the proportion of effective signals in the entire journey is over 95%, grade B represents between 85% and 95%, grade C represents less than 85\%, grade D represents complete signal loss.

Table S1: Heart Rate Variability(HRV) Measures

Feature	Units	Description
LF	ms^2	Power in low-frequency band(0.04-0.15HZ)
HF	ms^2	Power in high-frequency band(0.15-0.4HZ)
Mean HR	bpm	Averaged heart rate
RMSSD	ms	The square root of the mean of the sum of the squares of differences between adjacent NN intervals
SDNN	ms	Standard deviation of all NN intervals
NN50		Number of pairs of adjacent NN intervals with a difference exceeding 50 ms in the entire recording
NN20		Number of pairs of adjacent NN intervals with a difference exceeding 20 ms in the entire recording