motion sensor unit worn on the waist

typical fall signals
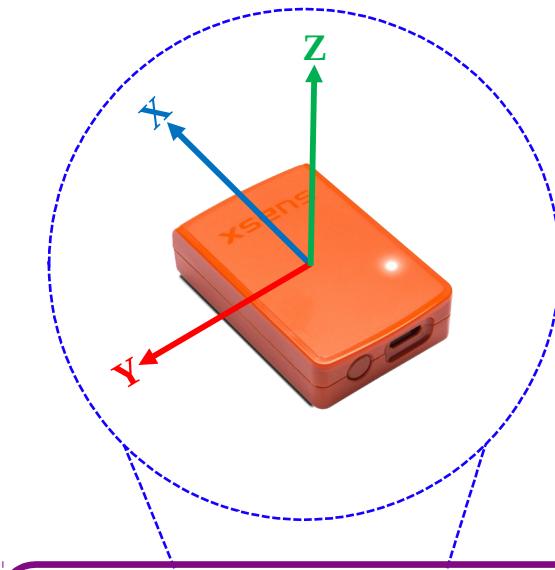
raw data acquisition

Fall-Direction Classification
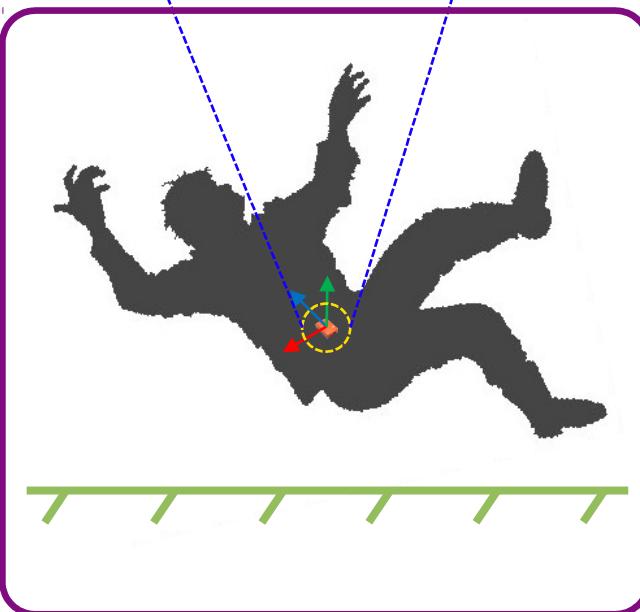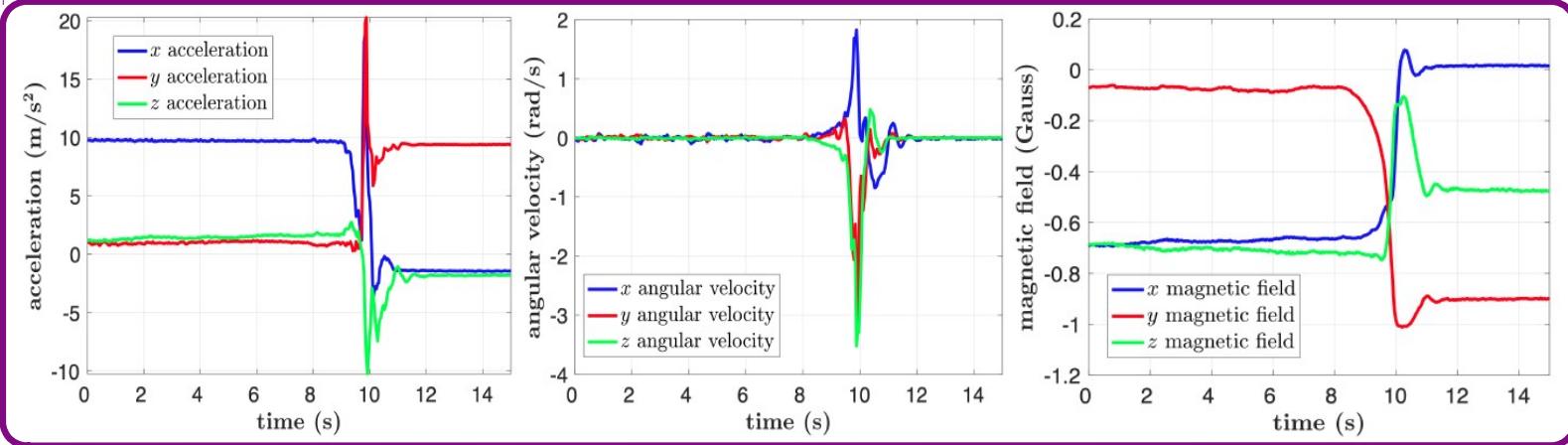
feature extraction

min, max, mean of acceleration, angular velocity, magnetic field in x, y, z directions
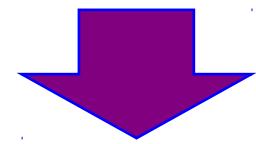
27 simple features

machine learning

BDM, LSM, *k*-NN, ANN, SVM, DTC, RF, AdaBoost classifiers

fall direction

forward

backward

right

left

undefined

RESULTS
- Conducted robustness analysis that includes falls with undefined directions, not in the training set.
- Above 96% fall-direction classification accuracy is achieved.
- Classification can be performed in near-real time (<5 ms).

fall event