

WHARF CODE: USER MANUAL

OVERVIEW

WHARF Code provides:

- **HMP Detection Library Functions** – a library of MATLAB functions for the creation of models of Human Motion Primitives on the basis of information coming from a single, wrist-placed tri-axial accelerometer (procedure detailed in [1]) and the classification of corresponding validation trials (procedure detailed in [2]).
- **GUI HMPdetector** – a graphical user interface to the library functions, allowing for the selection at run-time of the models of interest and the validation trials to be classified.

FILES TREE

```
HMP_detection_library
  Logo
    logo_unige.gif
  AnalyzeActualWindow.m
  BuildWHARF.m
  Classify.m
  CompareWithModels.m
  ComputeThreshold.m
  CreateDatasets.m
  CreateWindow.m
  GenerateModel.m
  GetComponents.m
  GetExpected.m
  HMPdetector.m
  InitializeGMM.m
  models_and_thresholds.mat
  ReadFiles.m
  RetrieveModel.m
  TrainGMM.m
  TuneK.m
  ValidateWHARF.m
```

Extensive help on each function can be accessed from MATLAB Command Window by typing:

```
help [name_of_the_function]
```

MODELLING FUNCTIONS LOGICAL TREE

```
BuildWHARF
  GenerateModel
    ReadFiles
    CreateDatasets
      GetComponents
    TuneK
    GetExpected
      InitializeGMM
      TrainGMM
      RetrieveModel
  ComputeThreshold
```

CLASSIFICATION FUNCTIONS LOGICAL TREE

ValidateWHARF

CreateWindow

AnalyzeActualWindow

CompareWithModels

Classify

INSTALLATION

1. Download the WHARF Code repository from GitHub at <https://github.com/fulviomas/WHARF>
2. Download the WHARF Data Set repository from GitHub at <https://github.com/fulviomas/WHARF>
3. Copy the **Data** folder of WHARF Data Set inside the **HMP detection library** folder
4. Inside the Data folder, create a folder **RESULTS**
5. Inside the Data folder, create a folder **VALIDATION**

USAGE

HMP DETECTION LIBRARY FUNCTIONS

1. Copy paste the trials selected for classification in the VALIDATION folder
2. Open MATLAB and move inside the HMP detection library folder
3. In MATLAB Command Window, build the models of WHARF dataset by typing:
`BuildWHARF`
4. Once the models have been created, validate the selected trials by typing:
`ValidateWHARF`
5. Validation results will be stored in the RESULTS folder, with the name:
"RES_[name_of_validation_trial]"

GUI HMPDETECTOR

1. Open MATLAB and move inside the HMP detection library folder
2. In MATLAB Command Window, open the HMPdetector GUI by typing:
`HMPdetector`
3. Instructions for the usage of the HMPdetector are located in the center panel of the GUI