

Documentation for Hand Motion Fusion based on Multi-Leap motion sensors MatLab toolbox

Author: Xinyao(Alvin) Sun

Version: 1.0.1

Last Modified Date: 2015-12-06

Project GitHub page: <https://github.com/Lucklyric/Fall2015MM804Project>

Folder tree

--|External // Contains some external library

 --|jsonlab-1.1 // Json parser in matlab

 --|libsvm-3.20 // SVM matlab toolbox

--|MatLabScripts // Contains core functions and scripts for the main work of this project

--|MotionData // Dataset

 --|JSON // Contains the motion file output by another GUI software for multi-leaps

 --|MAT // Contains the .mat file that parsed by the JSON parser

--|TrainedModel // Trained models

API Reference

addStableFactor

addStableFactor According to the side length and framerate

Return the new frames with Sided State Fact array

Author Xinyao(Alvin) Sun

Version 1.0.1

calculateED

calculateED Calculate the ED error with ground truth and array of frames

Author Xinyao(Alvin) Sun

Version 1.0.1

edError

edError Euclidean Distance from a given hand by comparing with the ground truth

Author Xinyao(Alvin) Sun

Version 1.0.1

globalSetting

Global Setting

Configure some key variables

Author Xinyao(Alvin) Sun

Version 1.0.1

loadJsonData

Script for loading the JSON file and save to the .mat

Author Xinyao(Alvin) Sun

Version 1.0.1

MainworkFlow

The Main workflow script
Author Xinyao(Alvin) Sun
Version 1.0.1

returnFeatureVector

returnFeatureVector Return the feature vector for the given hand with different type of strategy
Author Xinyao(Alvin) Sun
Version 1.0.1

scaleNormalize

scaleNormalize normalize the fature if needed
Author Xinyao(Alvin) Sun
Version 1.0.1

vector2stableFactor

vector2stableFactor This function return the single stable factor
inputArray is a variable list with length 3
frequecy is the framerate
Author Xinyao(Alvin) Sun
Version 1.0.1

In order to run the program

1. Add all toolbox under External Folder to your Matlab path.
 - a. Different operation system should re-compile the SVM files. Steps please follows the ReadMe under the libsvm folder.
2. Run MainworkFlow in command window
 - a. All configuration setting can be modified in globalSetting.m script

The link for external libraries

JSONlab: a toolbox to encode/decode JSON files in MATLAB/Octave

<http://www.mathworks.com/matlabcentral/fileexchange/33381-jsonlab--a-toolbox-to-encode-decode-json-files-in-matlab-octave>

LibSVM: is an integrated software for support vector classification, (C-SVC, nu-SVC), regression (epsilon-SVR, nu-SVR) and distribution estimation (one-class SVM). It supports multi-class classification.

<https://www.csie.ntu.edu.tw/~cjlin/libsvm/>