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

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

Folder tree

--|External // Contains some external library

--|jsonlab-1.1 // Json paser 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

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calculateED

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

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edError

**edError** Euclidean Distance fro a given hand by comparing with the ground

truth

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globalSetting

Global Setting

Configure some key variables

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loadJsonData

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

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MainworkFlow

The Main workflow script

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returnFeatureVector

**returnFeatureVector** Return the feature vector for the given hand with

different type of strategy

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scaleNormalize

**scaleNormalize** normalize the fature if needed

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vector2stableFactor

**vector2stableFactor** This function return the single stable factor

inputArray is a variable list with length 3

frequecy is the framerate

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In order to run the program

1. Add all toolbox under External Folder to your Matlab path.
   1. Different operation system should re-compile the SVM files. Steps please follows the ReadMe under the libsvm folder.
2. Run MainworkFlow in command window
   1. 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/>