Sensor Fusion Algorithm Software Design(Architecture)

SYSC5709F [35794]

Advance Topics in Software Engineering

Project – Phase 1

Submitted by:

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Project folder structure

```
SensorFusionAlgo
|   README.md
|   .gitignore
|   .gitmodules
|   makefile
|
|
└──src
|   |   file_operations.c
|   |   fusion_algorithm.c
|   |   sensor_valid_range.c
|   |   main.c
|
|
└──include
|   |   file_operations.h
|   |   fusion_algorithm.h
|   |   sensor_valid_range.h
|   |   main.h
|
|
└──build
|   |   file_operations.o
|   |   fusion_algorithm.o
|   |   sensor_valid_range.o
|   |   main.o
|
|
```

└──bin

| |

|

└──test

| | ...

| |

| └──files

| | input_file_1.txt

|

└──lib

| | gsl (GNU Scientific Library)

|

└──doc

| | SensorFusionAlgoDesign.md

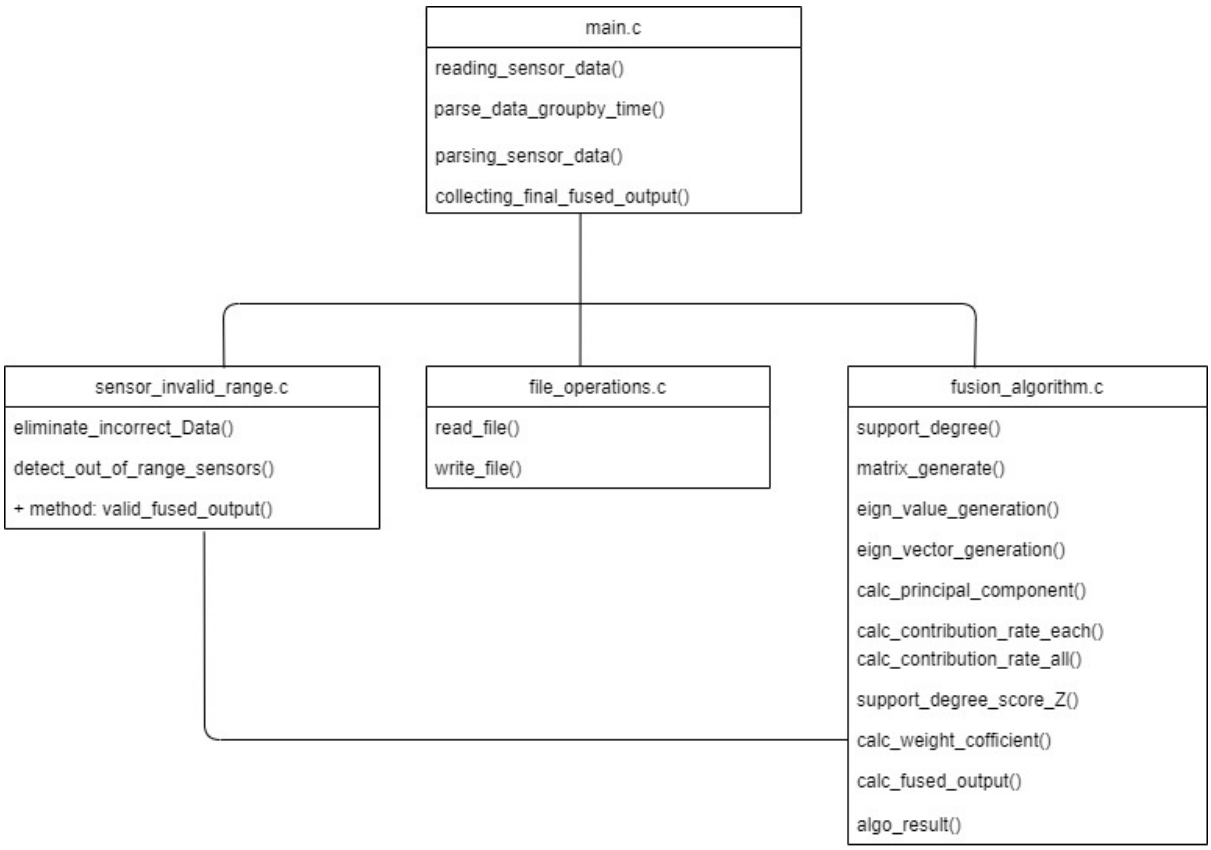
| | SensorFusionAlgoDesign.JPG

| | SensorFusionAlgoDesign.doc

| | SensorFusionCodeDocumentation.doc

| | UserGuide.doc

Visual representation of the schematic design



Description of the architecture

We are purposing a initial architecture for the SensorFusionAlgo. The purpose of the document is to define the architecture of the SensorFusion algorithm project i.e. a brief description of the structure of files folders and behaviour of the file.

We are following the approach so that most of the calculations are separated in between different functions and c files.

The main.c call the file input functions from file_operations.c to read the sensor data from the input file and then the data is parsed using the parse function formatting the data in a particular data structure, then the fusion algorithm calculations are performed as per the sensor fusion algorithm and fused output is returned by calling different functions defined in fusion.c. The fused values are then validated to be in the valid range by the sensor_invalid_range.c function and the valid range of fused output is returned to main.c and the output is sent to write_file() function to write data.

To-do Tasks

Tasks	Status/Deadline
Parsing data as per a structure.	In Progress
generating support_degree_matrix.	In Progress
Implementation of functions of calc_principal_component	To be completed by 11/07/19
generating eigenvalues and eigenvector	To be completed by 11/07/19
Implementation of other steps of the algorithm.	To be completed by 11/21/19
Writing code to write data in output file.	To be completed by 11/30/19
Complete user guide and Code documentation	To be completed by 12/07/19
Unit testing and integration testing of the software.	To be completed by 12/14/19
Deliver the software.	To be completed by 12/18/19

** **NOTE:** The complete folder structure and the design documentation is available in the git repository –

https://github.com/shreyataneja/SensorFusionAlgo