# Harmonisation Diagnostic Software User Guide

The document is intended to describe how to run the harmonisation diagnostic plotting software tool, which is located and intended to be run on CEMS.

## Running Harmonisation Diagnostic Software

The current implementation of the harmonisation diagnostic plotting software should be located in the CEMS directory:

/group\_workspaces/cems2/fiduceo/Software/harmonisation\_diagnostics

This is intended to take a harmonisation input and output dataset, comparison parameters and relevant sensor related functions and generate the set of agreed up plots, saving them in a plots subdirectory of the output dataset directory.

The main run script of the software of the package is called harmonisation\_diagnostics.py. In the package directory this can be run as:

python2.7 harmonisation\_diagnostics.py job.cfg

where job.cfg is a job configuration file, which is described in more detail in the next section. This can be easily submitted to CEMS for the required memory capacity the script run.sh, as:

bash run.sh job.cfg

## Harmonisation Framework Configuration File Parameters

Taking as a template an existing configuration file the parameters should be filled as follows:

### job\_id

This is just a two digit number of to separately identify jobs

### dataset\_dir

This is the path of the directory that contains the match-up data to harmonise

### parameter\_path

This is the path of a comma delimited csv file containing the input harmonisation parameters for the sensors (and only these sensors) is the dataset above. This is the parameters used to start the solver and also as the reference in the plotting.

Each sensors gets a new line and the ordering required for this is a bit funny:

The sensors rows should be in the order the sensors first appear in the pairs as they are listed in the directory. For example the AVHRR dataset you should them ordered as, n15, n16, n17, n18, n19, n08, n07, n09, n10, n11, n12, n14. The file for AVHRR\_RSIM\_3 is /group\_workspaces/cems2/fiduceo/Users/shunt/harmonisation\_configs/FastOpt/parameters.csv.

### output\_dir

Directory containing only the harmonisation output files, in which the plots are then saved in a subdirectory called plots

### data\_reader\_path

This is the path of the input harmonisation reader required for the dataset. In an ideal world this wouldn’t have to be specified as it could always be harm\_data\_reader.py

For the AVHRR data we need a special case files:

* harm\_data\_reader\_AVHRR\_4.py – for time-dependent AVHRR data, capability to deal with additional variables in input files for the averaging uncertainties
* harm\_data\_reader\_AVHRR\_3.py – for time independent AVHRR data, capability to deal with additional variables in input files for the averaging uncertainties and to ignore columns 4 and 9 of data arrays
* harm\_data\_reader\_AVHRR\_3\_sample.py – same as harm\_data\_reader\_AVHRR\_3.py but only reader the first 1000 match-ups for quick testing

Hopefully we’ll move towards a solution where special case readers aren’t required eventually.

### sensor\_funcitons\_path

Path to my sensor functions python file.

For the AVHRR again we have:

* sensor\_functions\_AVHRR\_4.py – for time-dependent AVHRR data
* sensor\_functions\_AVHRR\_3.py – for time independent AVHRR data
* sensor\_functions\_AVHRR\_3\_scaled.py – for time independent AVHRR data with scaled input parameters

In general (and presumably soon for MW and HIRS) the sensor functions file should contain three functions, computing the sensor model, adjustment model and inter-matchup correlation.cp