# “Data Fusion Framework”

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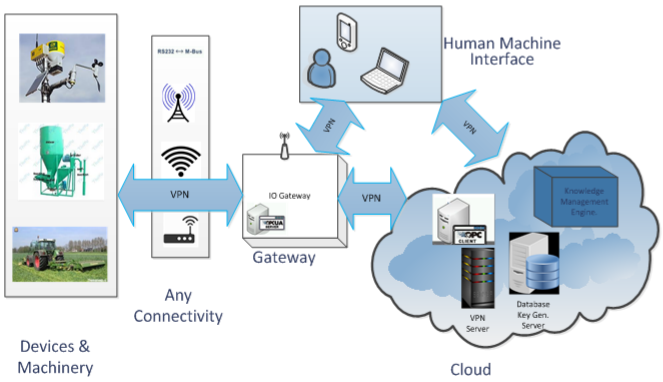
Data fusion is used for raw data (obtained directly from the sensors) and the term information fusion is employed to define already processed data which means that the term information fusion implies a higher semantic level than data fusion.

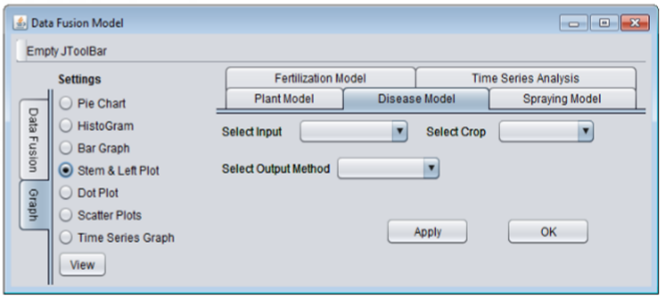



Data collection & fusion architecture

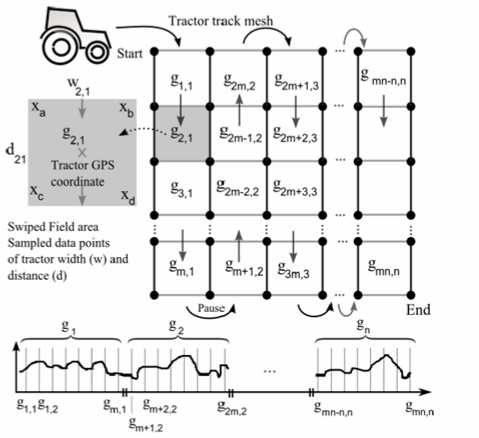
| No. | Parameter | Type | Units | Example Value |
|---|---|---|---|---|
| 01 | Rainfall | float | Centimeter | 1 cm |
| 02 | Relative air humidity | int8_t | Percentage | 1 % |
| 03 | Wind direction | int8_t | Degree Celsius | 3° |
| 04 | Wind speed | int16_t | Meters per second | 0.1 m/s |
| 05 | Air temperature | int16_t | Degree Celsius | 0.1 °C |
| 06 | Air pressure | uint16_t | MilliBar | 1 mBar |
| 07 | Soil temperature sensor 1 | int16_t | Degree Celsius | 0.1 °C |
| 08 | Soil temperature sensor 2 | int16_t | Degree Celsius | 0.1 °C |
| 09 | Soil temperature sensor 3 | int16_t | Degree Celsius | 0.1 °C |
| 10 | Soil temperature sensor 4 | int16_t | Degree Celsius | 0.1 °C |
| 11 | Soil moisture sensor 1 | int8_t | Percentage | 1 % |
| 12 | Soil moisture sensor 2 | int8_t | Percentage | 1 % |
| 13 | Soil moisture sensor 3 | int8_t | Percentage | 1 % |
| 14 | Soil moisture sensor 4 | int8_t | Percentage | 1 % |

Parameters collected from devices outdoors

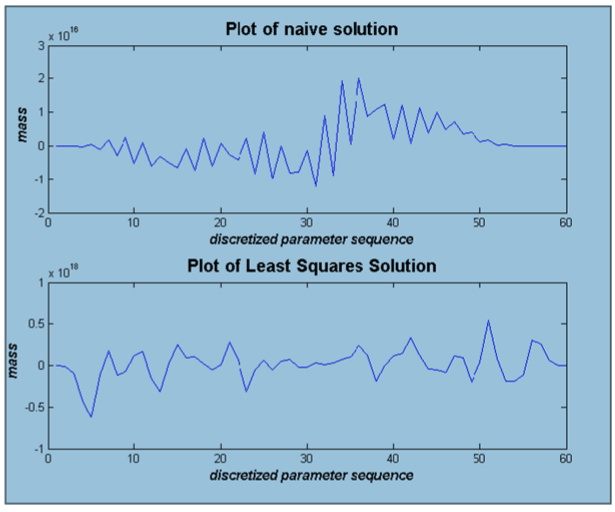
The received data at the gateway stationed at Vakola (LUKE, Finland) is compared with the geographical climatology site of Finland (http://en.ilmatieteenlaitos.fi/climate). The information from is extract as xml file and then parse to the embedded C to run at gateway or in CLAFIS cloud. The forecast developed contains various weather parameter is another parameter used in the validation technique. The third parameter used is history. History used is previous values of temperature and other weather parameters.




Data Fusion Framework (stand-alone version)




The fertilization process and vectorization of fertilizer desposits)




Comparative Plots of Naive Solution & Least Square Solutions

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