MeteoIO: A Pre-Processing Library for Numerical Models

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Reading Data
- data reading handled by plugins
- plugins can deal with meteo data, gridded data, DEM, landuse, Points Of Interest (POI) definitions

Raw Data Editing
- tweak the data coming out of the plugin as described by the user in the configuration file
- exclude, rename or copy parameters
- convert parameters (ex. dew point temperature -> relative humidity) or use parameterizations (ex. potential radiation)

Filtering Data
- filtering out bad points (12 algorithms)
- correcting values (14 algorithms)
- filters are defined per meteo parameter
- any number of filters can be stacked

Typical setup
- data acquisition
- data storage & distribution
- numerical model
- user configuration file
- processed data distribution

Workflow
- Read Data
- Raw data editing
- Filter Data
- Resample Data
- Generate Data
- Spatialize Data
- Call (data consumer)

Resampling Data
- temporal resampling to the time step requested by the model
- 7 algorithms to choose from
- algorithms are defined per meteo parameter
- a window size is defined per parameter; prevents large gaps from being unnecessarily filled

Generating Data
- when filtering and resampling created left data gaps, for example filling small precipitation for the few missing data points, or filling missing ISWR data with All Sky parametrization
- 13 algorithms to choose from (from very basic to quite advanced: CST, AllSky_LW, precipitation from snow height increments...)
- multiple algorithms might be provided (fallback mechanism)

Spatially Interpolating Data
- distributing the available data on the provided DEM; 20 algorithms to choose from
- multiple algorithms might be provided so the appropriate method can be chosen according to the available data at each time step (fallback mechanism)
- possibility to define virtual stations: instead of filling a grid, construct time series for individual points (=downscaling)

Getting MeteoIO
MeteoIO is an Open Source, C++ library (LGPLv3 license). It works on Linux, cygwin, Windows... Download your copy today at https://meteoio.net!

References

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- Resample Data
- Generate Data
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