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Cooling network thesis. Code architecture and documentation

Date de publication :

Technical documentation

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1. Object

This document aims to provide a quick-start guide of the Cooling network optimization tool deployed in Python with no graphical UI. It allows to a new user to :

- Understand the architecture of the toll, the differents modules/algorithm and how it works
- Identify the prerequisite packages to install
- Run the program.

2. Architecture of the tool

You describe here the global features of your tool, make a list of the differents modules (network model, pump model, chiller model, optimization, reinforcement learning, etc…), and how they interact.
You can get inspired of the following figure that have been made for the VERI project "hydroleak" and of course of those done in your PhD report...

3. Global Dependencies

You describe the package used

- Python packages (exemple…):
  - Python 3.7
  - Numpy
  - Pandas
  - Scipy
  - Configparser
  - RBFOpt
  - Pyomo
  - sklearn
  - ….
- Optimization solvers (exemple…):
  - Bonmin, Ipopt and CBC solvers

4. Modules description

You describe here the differents modules (a module can be a model or any algorithm,...) and for each one:

- *What the module do (make a diagram of the module if possible)*
- *table of Input data (specify if input data come from another module or if it is external data for ex: meteorological data) . If it is external data: specify where they can be found)*

input data	Description	Type	Units
name of the variable in the python code	Description	string/float/integer, array,...	°C, K, m3.h, etc.

- *Table of Output data*

you describe the output data and its format (file, object, a model...)

Output data	Description	Type	Units
name of the variable in the python code	Description of the variable	string/float/integer, array,...	°C, K, m3/h, etc.

- *Table of Internal parameters*

Parameter	Description	Type	Units
name of the variable in	Description of the	string/float/integer, array,...	°C, K, m3/h, etc.

the python code	variable		

- *The associated python code: name of the script, where it is located (folder)*

5. Procedures to use the tool

You describe here the procedure to run the tool:

- *In which order to execute each modules*
- *etc.*