XM_HeatForecast

Documentation

Overview

1. How to install the software

2. How to launch XM_HeatForecast

3. Modules
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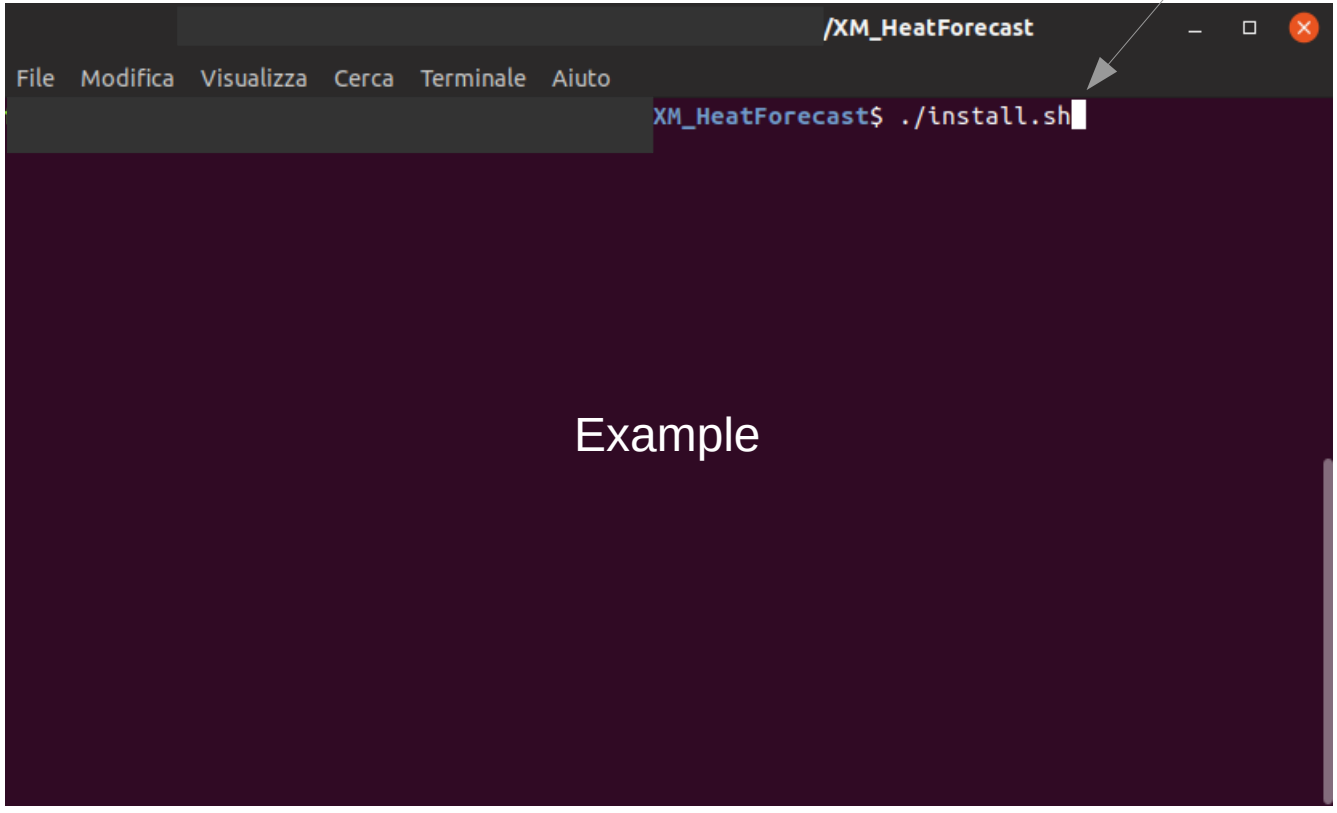
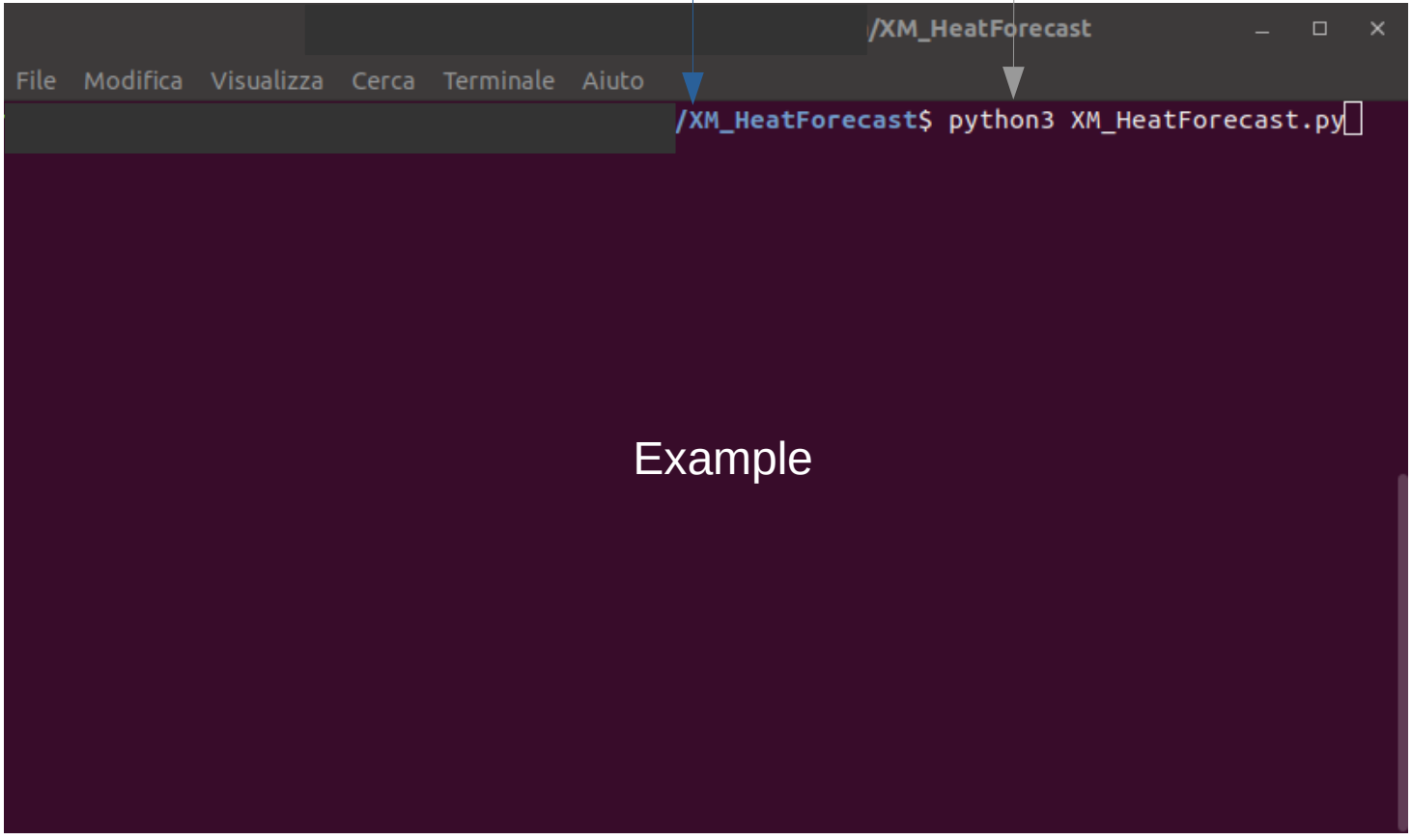
1. How to install the software

To use XM_HeatForecast, Python 3.X has to be installed.
Launch the script “install.sh” to install the libraries required, typing **“./install.sh”** on the terminal



2. How to launch XM_HeatForecast

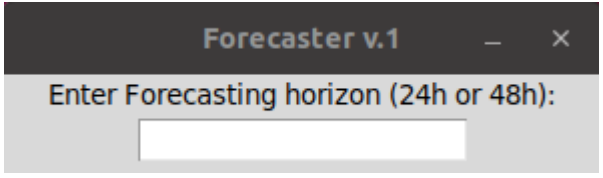
In order to launch XM_HeatForecast, the user has to simply type the command “**python3 XM_HeatForecast.py**” on terminal opened in the tool **folder**



Example

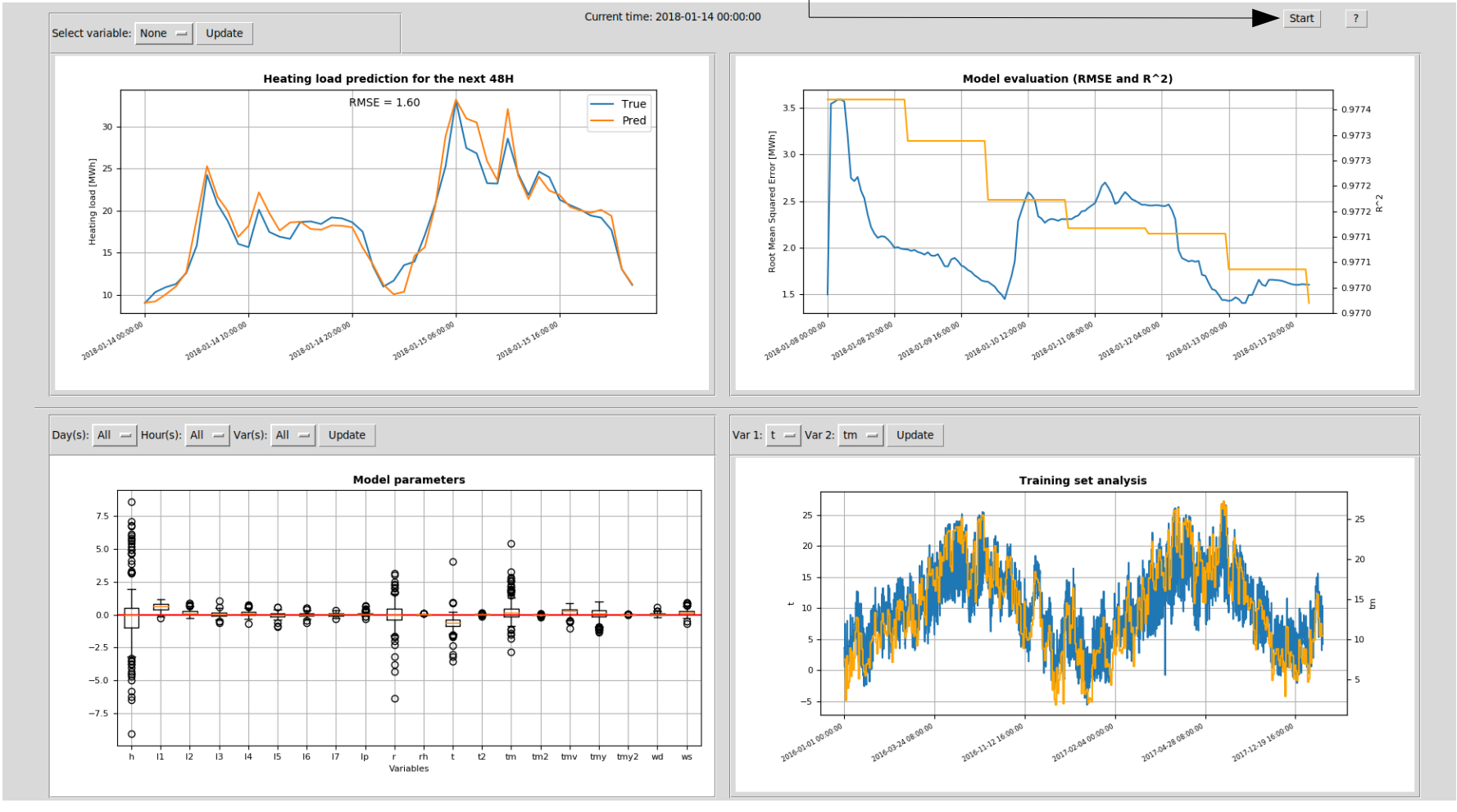
2. How to launch XM_HeatForecast

A new window should appear in the middle of the screen.
Type a “forecasting horizon” between 24 or 48 hours



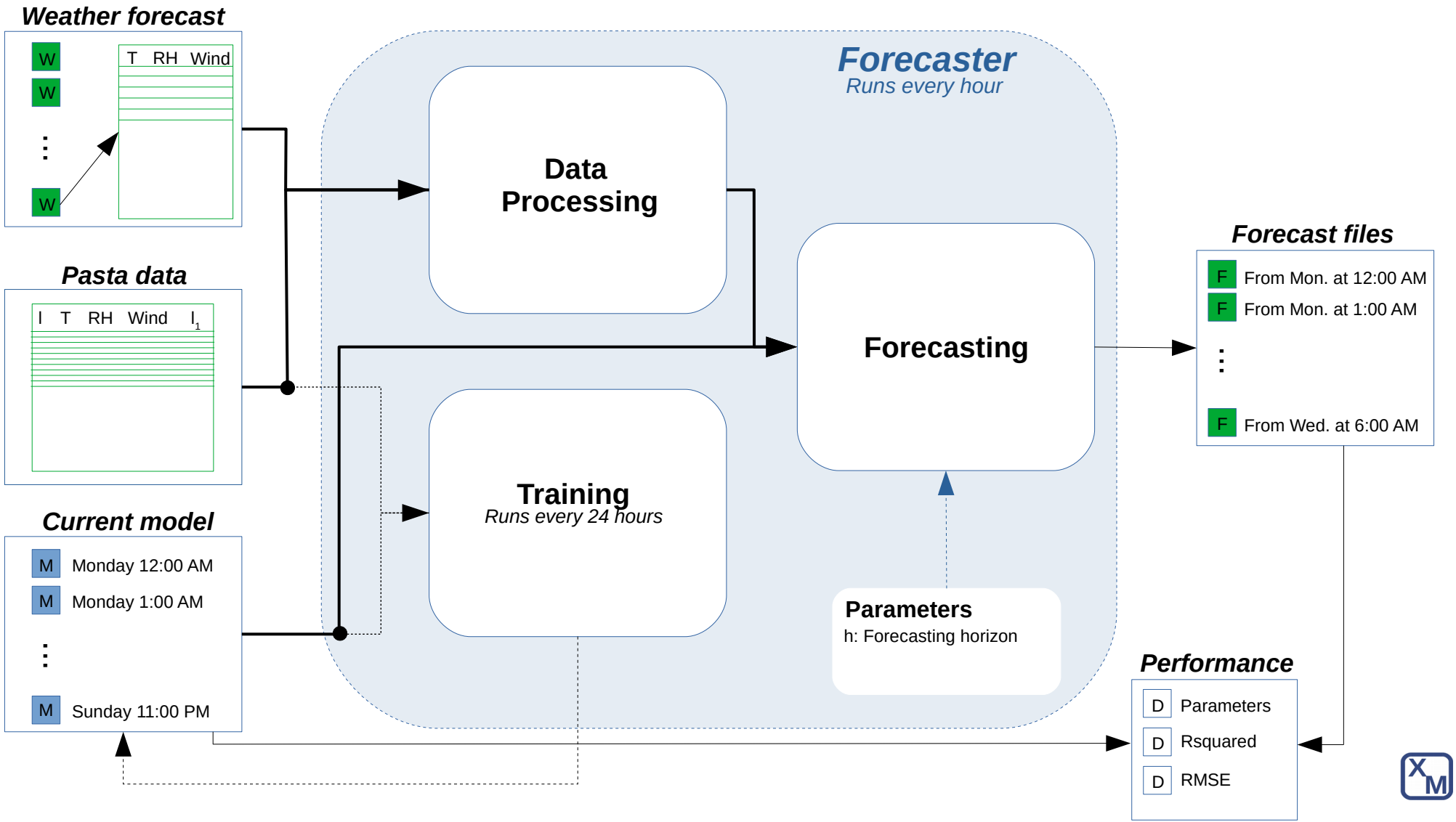
2. How to launch XM_HeatForecast

To launch XM_HeatForecast press **“Start”** button



3. Modules

3.1 - Forecaster


Weather forecast
W
W
W
T RH Wind
Pasta data
I T RH Wind I_1
Current model
M Monday 12:00 AM
M Monday 1:00 AM
M Sunday 11:00 PM
Forecaster
Runs every hour
Data Processing
Training
Runs every 24 hours
Forecasting
Parameters
h: Forecasting horizon
Forecast files
F From Mon. at 12:00 AM
F From Mon. at 1:00 AM
F From Wed. at 6:00 AM
Performance
D Parameters
D Rsquared
D RMSE

3.2 - GUI

Performance

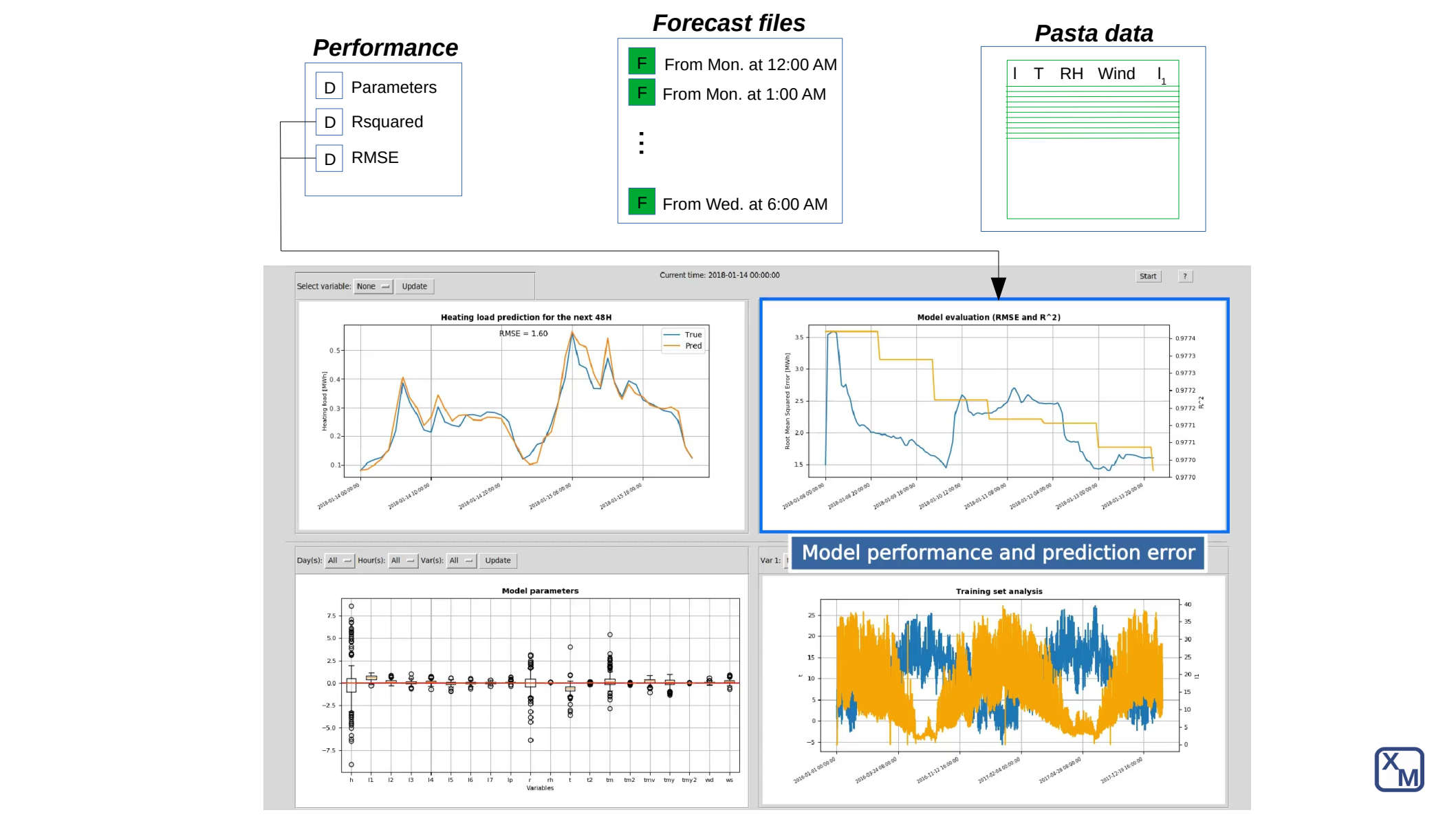
- D Parameters
- D Rsquared
- D RMSE

Forecast files

- F From Mon. at 12:00 AM
- F From Mon. at 1:00 AM
- ⋮
- F From Wed. at 6:00 AM

Pasta data

I	T	RH	Wind	I_1


Performance
D Parameters
D Rsquared
D RMSE
Forecast files
F From Mon. at 12:00 AM
F From Mon. at 1:00 AM
F From Wed. at 6:00 AM
Pasta data
I T RH Wind I_1
Select variable: None Update
Current time: 2018-01-14 00:00:00
Start ?
Heating load prediction for the next 48H
RMSE = 1.60
True
Pred
Heating load [MWh]
Model evaluation (RMSE and R^2)
Root Mean Squared Error [MWh]
R^2
Model performance and prediction error
Day(s): All Hour(s): All Var(s): All Update
Model parameters
Variables
Training set analysis

Performance

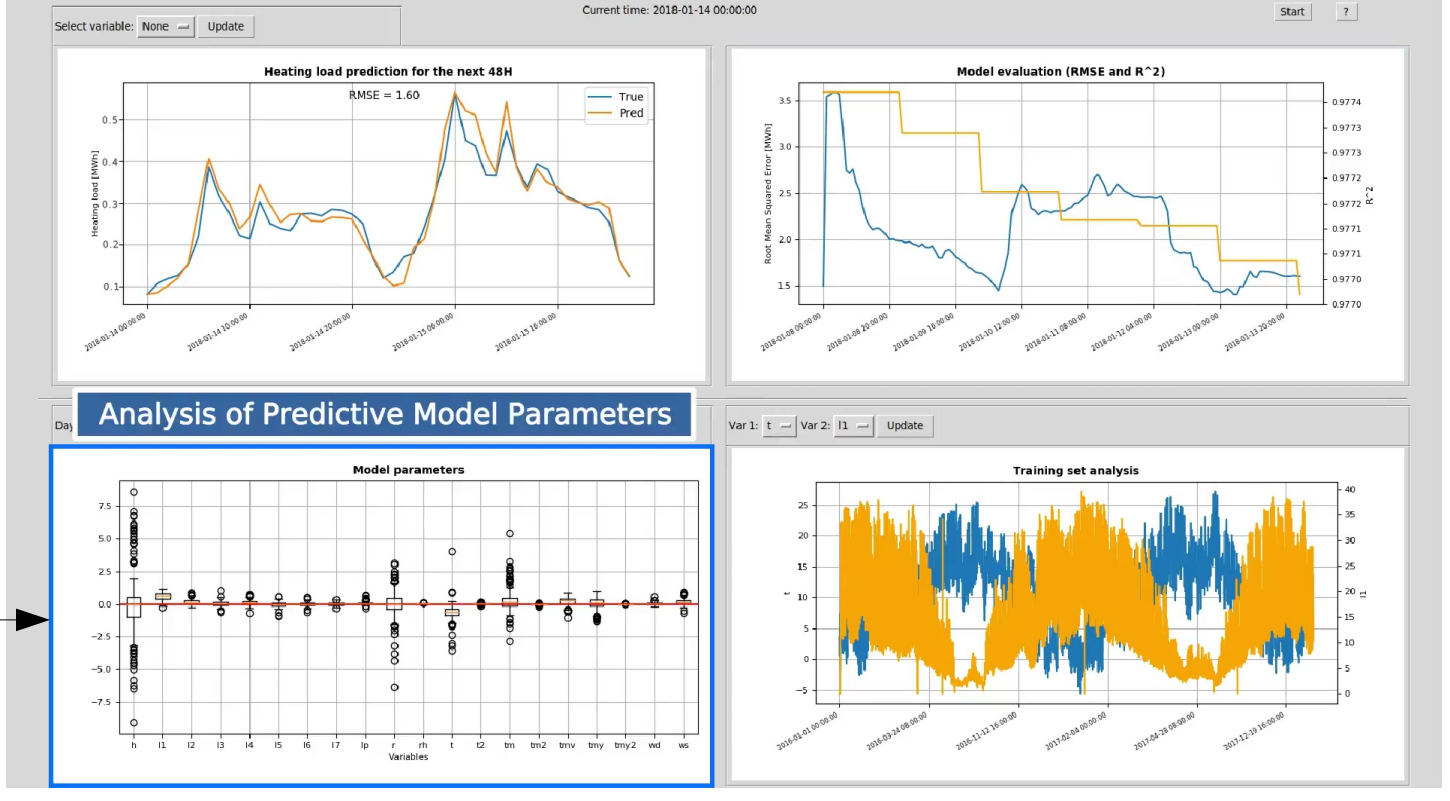
- D Parameters
- D Rsquared
- D RMSE

Forecast files

- F From Mon. at 12:00 AM
- F From Mon. at 1:00 AM
- ⋮
- F From Wed. at 6:00 AM

Pasta data

I	T	RH	Wind	I_1



Performance

- D Parameters
- D Rsquared
- D RMSE

Forecast files

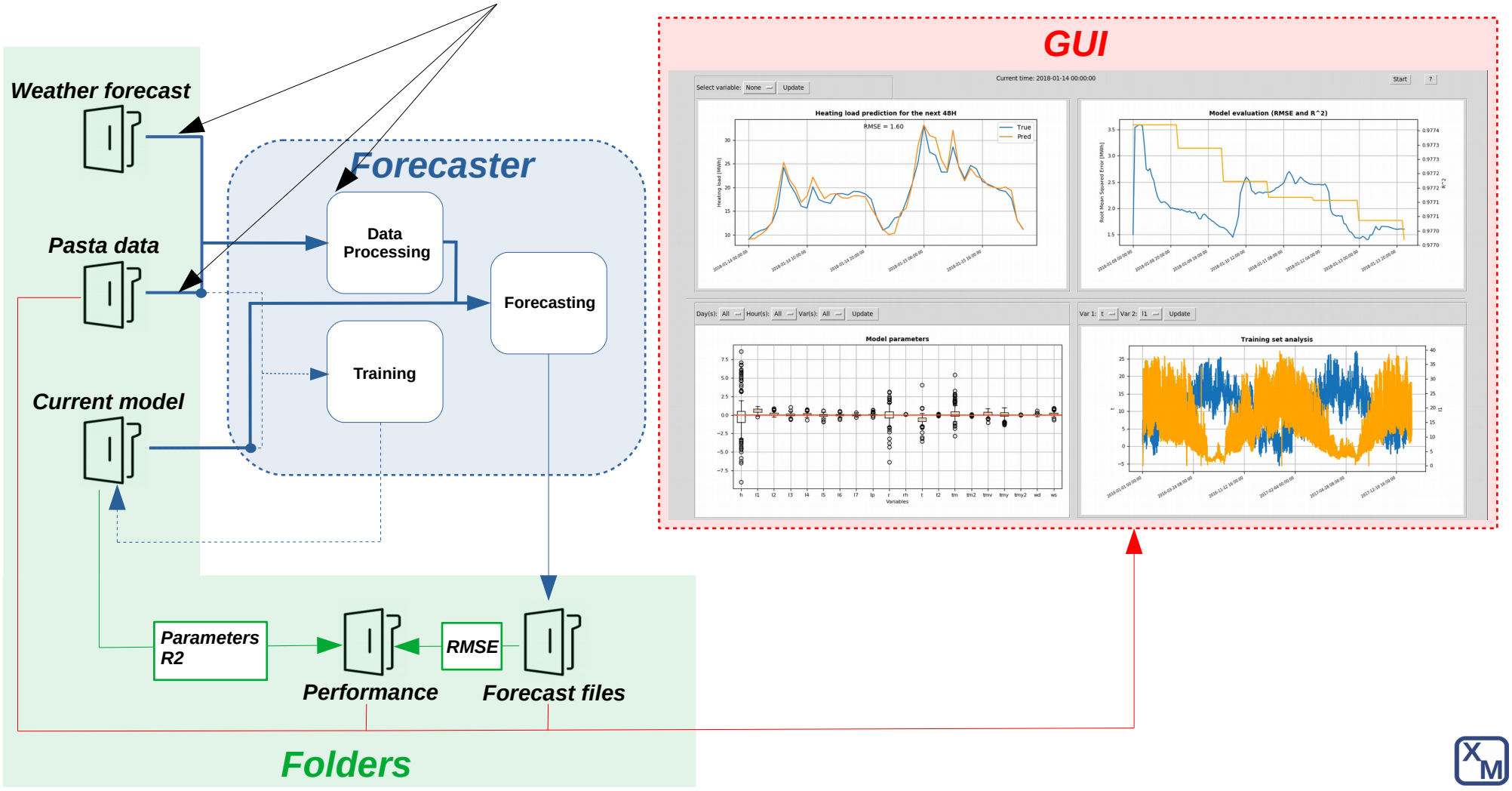
- F From Mon. at 12:00 AM
- F From Mon. at 1:00 AM
- ⋮
- F From Wed. at 6:00 AM

Pasta data

I	T	RH	Wind	I_1

3.3 - Overview

“Data Processing” takes in input every hour a “Weather forecast” files with date yyyy-mm-dd hh:mm and “Pasta data” until yyyy-mm-dd hh:mm in order to process the information



“Training” module trains a model each 24 hours using past data and saves it in the folder “Current model”

Weather forecast

Pasta data

Current model

Forecaster

Data Processing

Forecasting

Training

Parameters R2

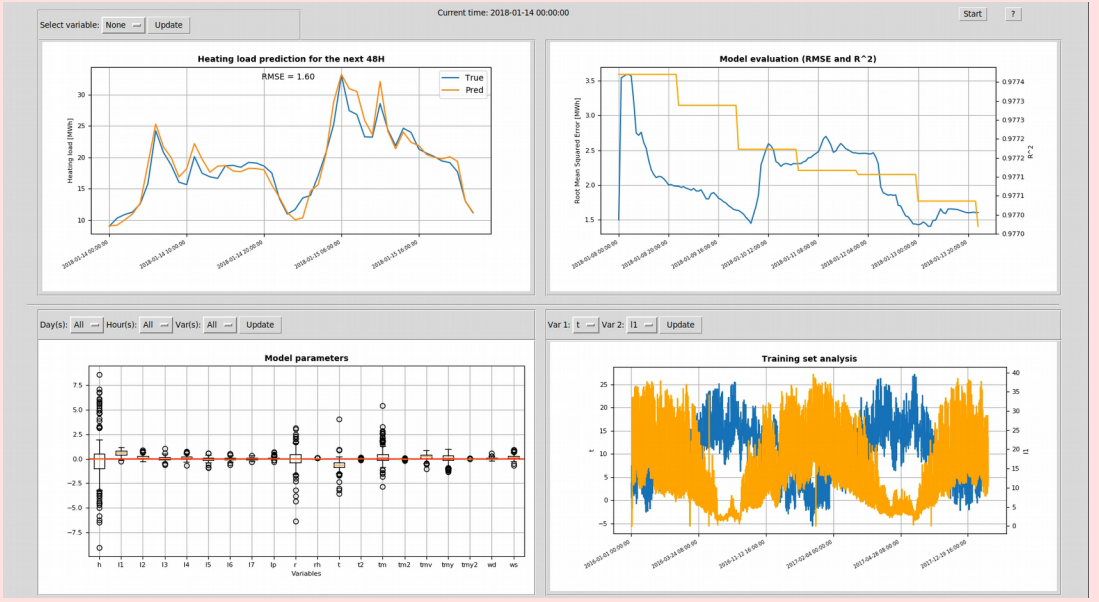
RMSE

Performance

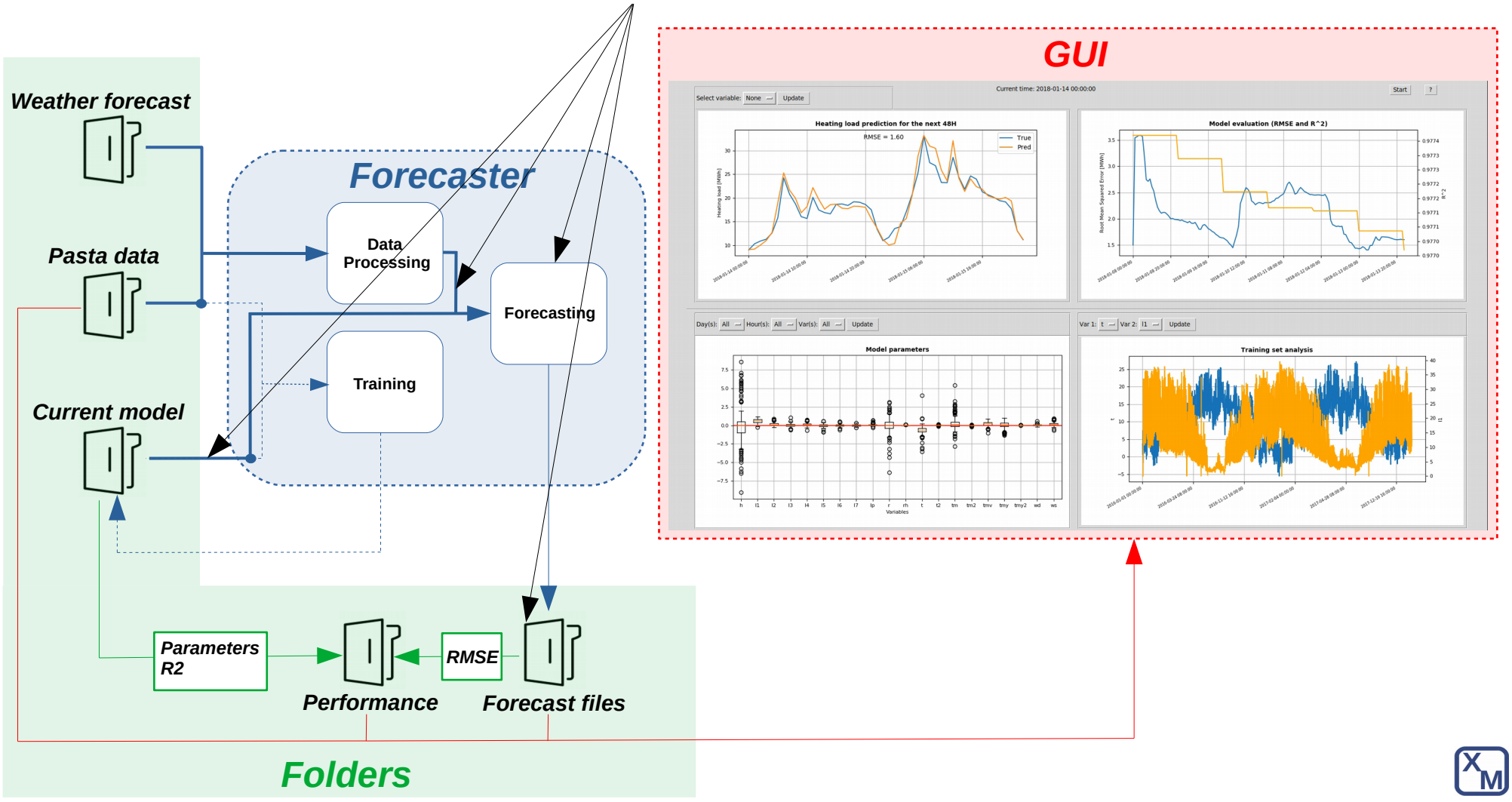
Forecast files

Folders

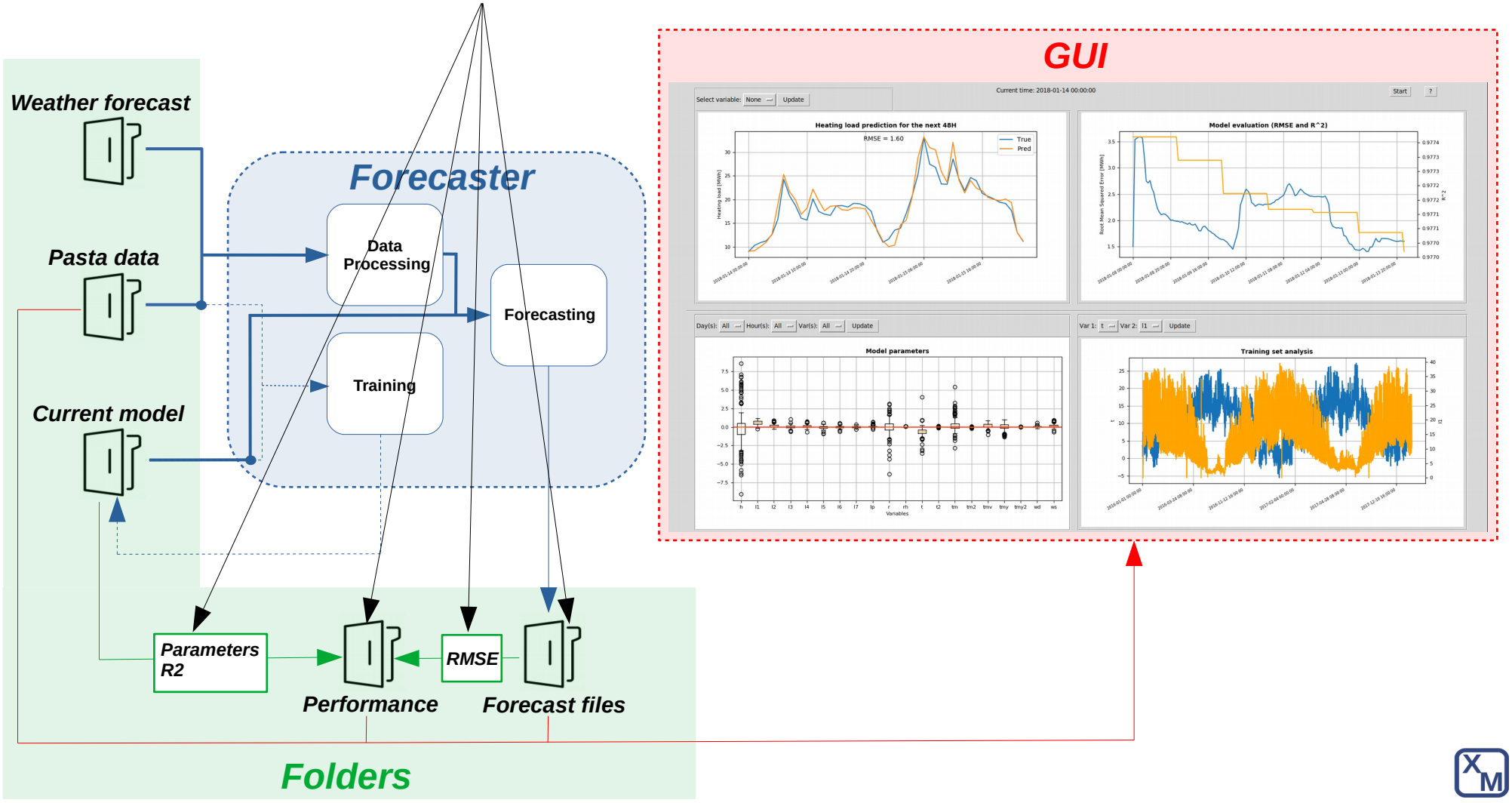
GUI



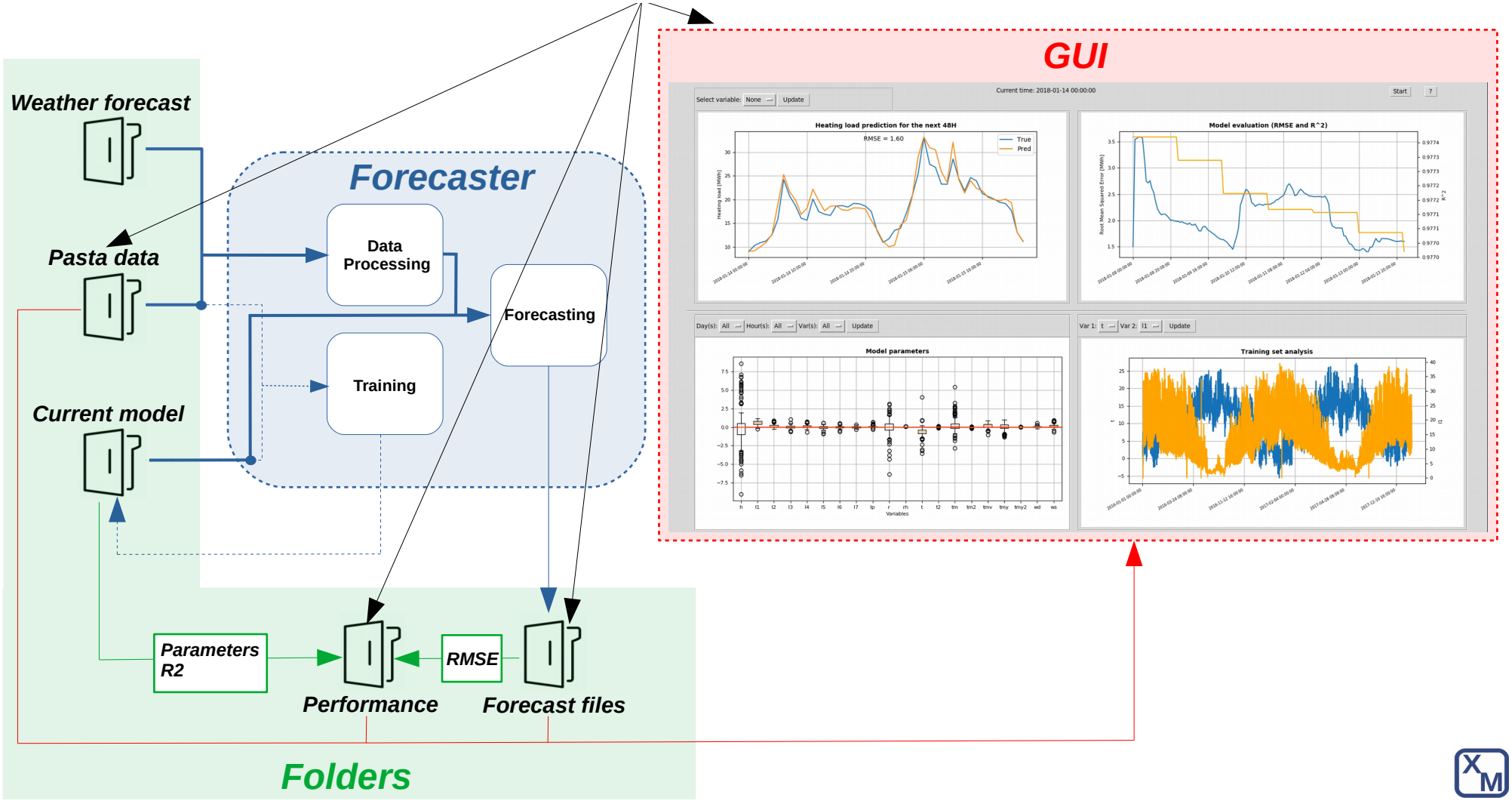
“Forecasting” module predicts the next 24 or 48 hours of heating load every hour, using the current model, data processed until yyyy-mm-dd hh:mm and saves the result in the folder “Forecast files”



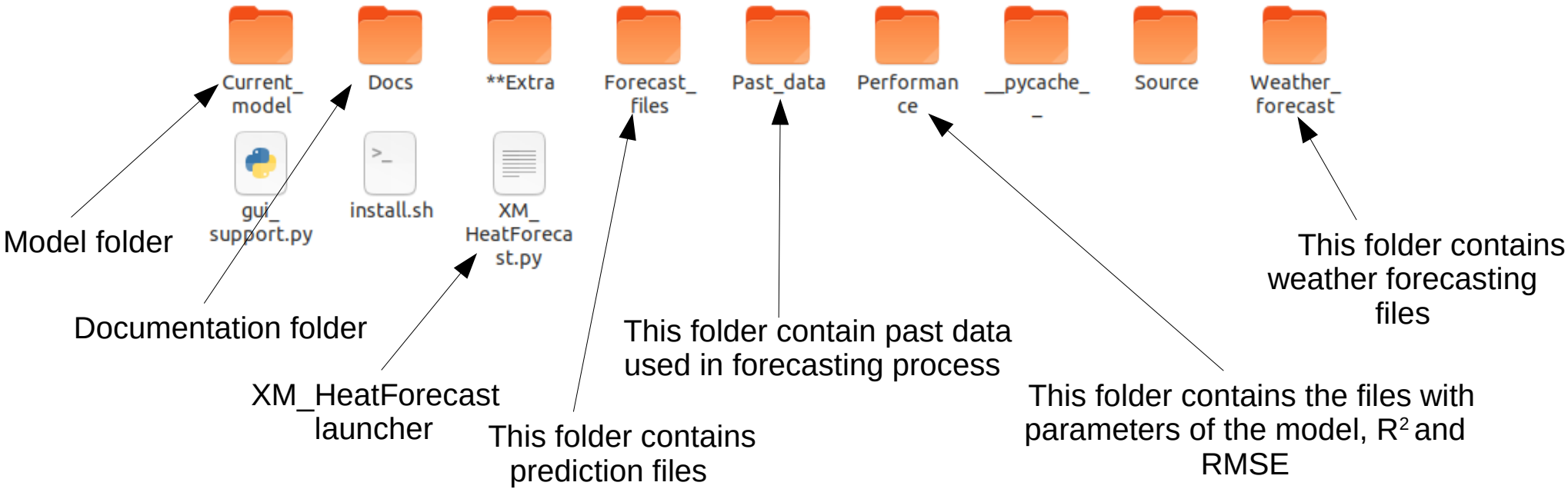
Each 24 hours parameters of the current model, R^2 coefficient and RMSE are computed



GUI fetches data from the folders “Past data”, “Performance” and “Forecast files”, creating graphic visualizations in order to support the interpretability of results

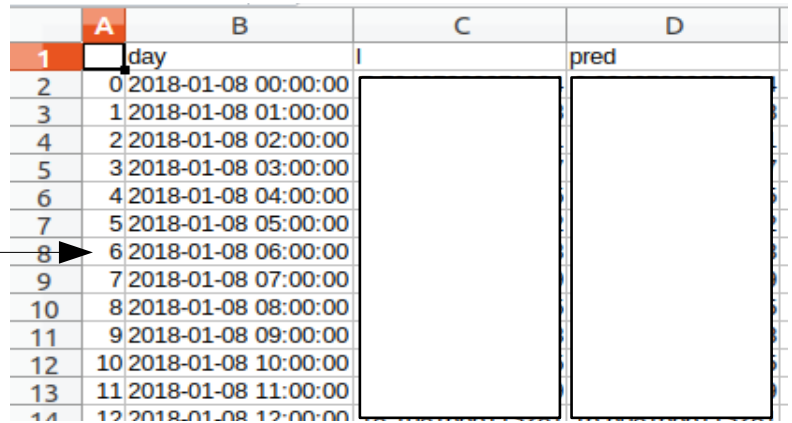


4. Overview of folders and files



4. View of a forecasting file

XM_HeatForecast generates a .csv file each 24 hours



	A	B	C	D
1		day	l	pred
2	0	2018-01-08 00:00:00		
3	1	2018-01-08 01:00:00		
4	2	2018-01-08 02:00:00		
5	3	2018-01-08 03:00:00		
6	4	2018-01-08 04:00:00		
7	5	2018-01-08 05:00:00		
8	6	2018-01-08 06:00:00		
9	7	2018-01-08 07:00:00		
10	8	2018-01-08 08:00:00		
11	9	2018-01-08 09:00:00		
12	10	2018-01-08 10:00:00		
13	11	2018-01-08 11:00:00		

Predictions of the next 24 or 48 hours

Date and hour of prediction

Real load

Predicted load