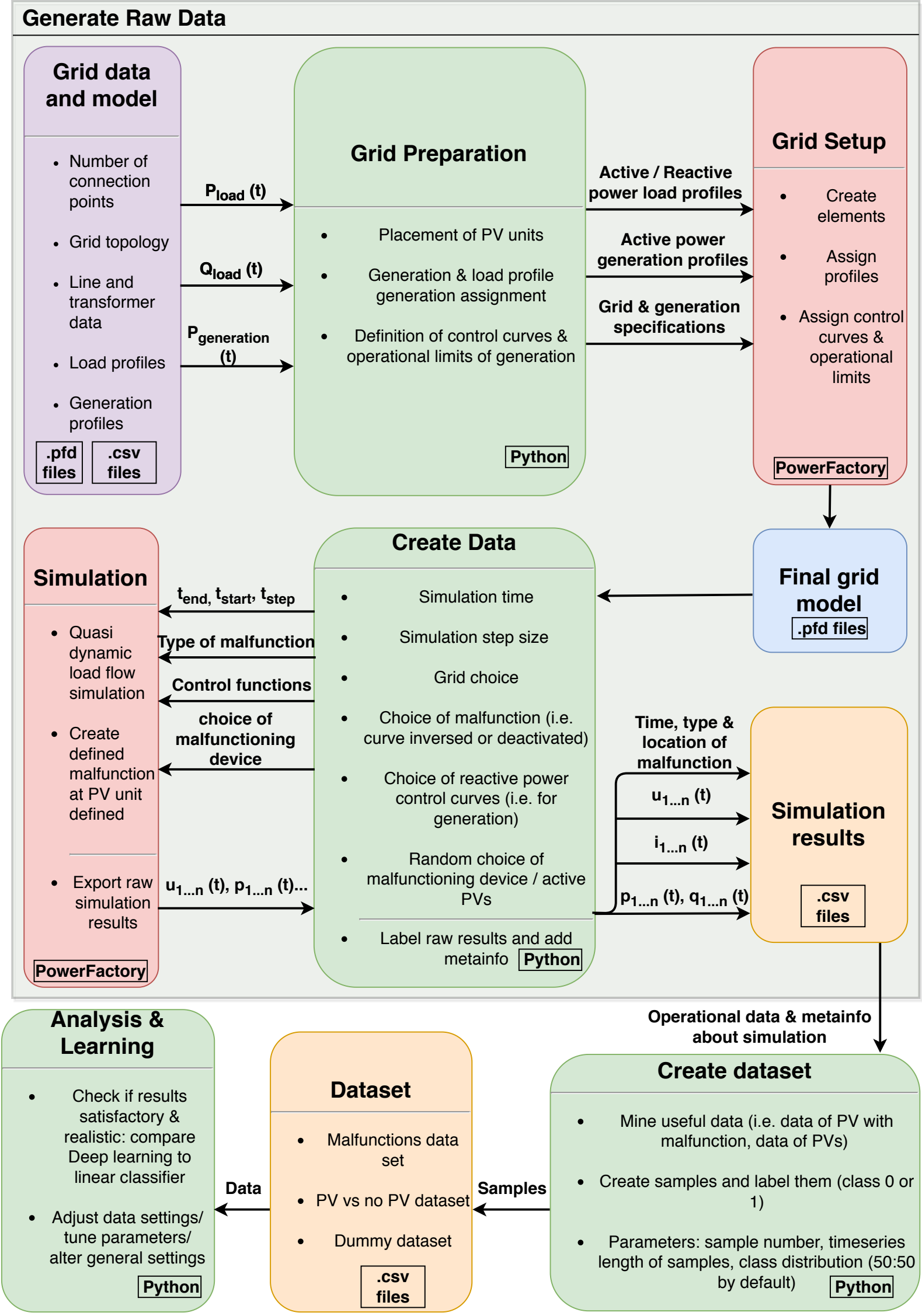
Generate Raw Data
Grid data and model
Number of connection points
Grid topology
Line and transformer data
Load profiles
Generation profiles
.pfd files
.csv files
P load (t)
Q load (t)
P generation (t)
Grid Preparation
Placement of PV units
Generation & load profile generation assignment
Definition of control curves & operational limits of generation
Python
Active / Reactive power load profiles
Active power generation profiles
Grid & generation specifications
Grid Setup
Create elements
Assign profiles
Assign control curves & operational limits
PowerFactory
Final grid model
.pfd files
Create Data
Simulation time
Simulation step size
Grid choice
Choice of malfunction (i.e. curve inversed or deactivated)
Choice of reactive power control curves (i.e. for generation)
Random choice of malfunctioning device / active PVs
Label raw results and add metainfo
Python
t end, t start, t step
Type of malfunction
Control functions
choice of malfunctioning device
Simulation
Quasi dynamic load flow simulation
Create defined malfunction at PV unit defined
Export raw simulation results
PowerFactory
u 1...n (t), p 1...n (t)...
Time, type & location of malfunction
u 1...n (t)
i 1...n (t)
p 1...n (t), q 1...n (t)
Simulation results
.csv files
Operational data & metainfo about simulation
Create dataset
Mine useful data (i.e. data of PV with malfunction, data of PVs)
Create samples and label them (class 0 or 1)
Parameters: sample number, timeseries length of samples, class distribution (50:50 by default)
Python
Samples
Dataset
Malfunctions data set
PV vs no PV dataset
Dummy dataset
.csv files
Data
Analysis & Learning
Check if results satisfactory & realistic: compare Deep learning to linear classifier
Adjust data settings/ tune parameters/ alter general settings
Python