

workspace file load

workspace file save

new workspace

clear log

SKYNet Software 1.0 (build 2021) on Windows10 64 bit
C/C++ Compiler: Microsoft Visual Studio Pro Version 2019

준비 NUM

Log screen

Model List Dialog

Model List Dialog

model name
map/map_lattice_parameter_austb
map/map_lattice_parameter_ferriit
map/adi/map_adi_uts
map/adi/map_adi_ys
map/adi/map_adi_elongation
map/adi/map_adi_hardness
map/adi/map_adi_charpy
map/map_steel_bake_hardening
map/map_steel_creep_life_auster
map/map_steel_creep_strength_a
map/map_steel_ferritic_creep_rup
map/map_steel_elongation
map/map_steel_elongation_irradia

Input Condition List Dialog

Input Condition List Dialog

input set
input_00
input_01
sample

Detailed information of each input condition for prediction

Detailed information of each input condition for prediction

label	min	max	value	grid
C	3.02			11
Si	1.87	3.7	2.5	11
Mn	0	1.23	0.3	11
Mo	0	0.74	0.1	11
Ni	0	4.83	0.5	11
Cu	0	2.1	0.3	11
A-temp	800	1067	895.6	11
A-time	5	960	106.5	11
austempering-te...	230	500	350.1	11
austempering-time	1	4320	241.5	11
log(austemperin...	1.7782	5.4136	3.8	11

Committee List Dialog

Committee List Dialog

comm	hidden
__n4	14
__p1	16
__p5	16
__q4	17
__r2	18
__t1	20
__t4	20

Genetic Algorithm Optimizer

Genetic Algorithm Optimizer

label	opt
C	0
Si	0
Mn	0
Mo	0
Ni	0
Cu	0
A-temp	0
A-time	0
auste...	0
auste...	0
log(au...	0

model	target	weight
map/adi/map_adi_uts	1091.7	1

Population: 100
Generation: 50

Detailed information of each input condition for optimization

Model List Dialog

- Test from file
- Show model information from readme file
- Show data stat from MINMAX file

The screenshot displays the SKYNet software interface. The main window shows a list of models in the 'Model' pane. A callout box on the left provides instructions for interacting with this list:

- 1. Right click
- 2. Choose menu
 - add new model
 - delete model

Other tool windows are visible:

- Input**: Shows input set parameters like input_00, input_01, and sample.
- Byesian Neural Network Predictor**: Displays a table of model statistics.
- Committee**: Shows a table of committee members with columns for 'comm' and 'hidden'.
- Genetic Algorithm Optimizer**: Shows optimization parameters and a table of model performance.

label	min	max	value	grid
C	3.02	4.05	3.6	11
Si	1.87	3.7	2.5	11
Mn	0	1.23	0.3	11
Mo	0	0.74	0.1	11
Ni	0	4.83	0.5	11
Cu	0	2.1	0.3	11
A-temp	800	1067	895.6	11
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log(austemperin...	1.7782	5.4136	3.8	11

comm	hidden
__n4	14
__p1	16
__p5	16
__q4	17
__r2	18
__t1	20
__t4	20

label	opt	model	target	weight
C	0	map/adi/map_adi_uts	1091.7	1
Si	0			
Mn	0			
Mo	0			
Ni	0			
Cu	0			
A-temp	0			
A-time	0			
auste...	0			
auste...	0			
log(au...	0			

Committee List Dialog

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Model

- map/map_lattice_parameter_aust
- map/map_lattice_parameter_ferri
- map/adi/map_adi_uts
- map/adi/map_adi_ys
- map/adi/map_adi_elongation
- map/adi/map_adi_hardness
- map/adi/map_adi_charpy
- map/map_steel_bake_hardening
- map/map_steel_creep_life_auster
- map/map_steel_creep_strength_a
- map/map_steel_ferritic_creep_rup
- map/map_steel_elongation
- map/map_steel_elongation_irradia

Input

- input_00
- input_01
- sample

Byesian Neural Network Predictor

label	min	max	value	grid
C	3.02	4.05	3.6	11
Si	1.87	3.7	2.5	11
Mn	0	1.23	0.3	11
Mo	0	0.74	0.1	11
Ni	0	4.83	0.5	11
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Committee

comm	hidden
__n4	14
__p1	16
__p5	16
__q4	17
__r2	18
__t1	20
__t4	20

Genetic Algorithm Optimizer

label	opt	model	target	weight
C	0	map/adi/map_adi_uts	1091.7	1
Si	0			
Mn	0			
Mo	0			
Ni	0			
Cu	0			
A-temp	0			
A-time	0			
auste...	0			
auste...	0			
log(au...	0			

Population: 100
Generation: 50

준비 NUM

Input List Dialog

SKYNet Software 1.0 (build 2021) on Windows10 64 bit
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1. Right click
2. Choose menu

- add new input condition
- delete input condition
- modify name

label	min	max	value	grid
C	3.02	4.05	3.6	11
Si	1.87	3.7	2.5	11
Mn	0	1.23	0.3	11
Mo	0	0.74	0.1	11
Ni	0	4.83	0.5	11
Cu	0	2.1	0.3	11
A-temp	800	1067	895.6	11
A-time	5	960	106.5	11
austempering-te...	230	500	350.1	11
austempering-time	1	4320	241.5	11
log(austemperin...	1.7782	5.4136	3.8	11

label	opt	model	target	weight
C	0			
Si	0			
Mn	0			
Mo	0			
Ni	0			
Cu	0			
A-temp	0			
A-time	0			
auste...	0			
auste...	0			
log(au...	0			

comm	hidden
__n4	14
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Each input condition stores conditions for predictor and optimizer.

- Predictor : min, max, pivot value and step size of input variables.

- Optimizer : whether to optimize input variables, target models, target values, weights for norm calculation

Predictor Dialog

Start prediction

1. Right click
2. Modify
Or
Double click the item

label	min	max	value	grid
C	3.02	4.05	3.6	11
Si	1.87	3.7	2.5	11
Mn	0	1.23	0.3	11
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comm	hidden
__n4	14
__p1	16
__p5	16
__q4	17
__r2	18
__t1	20
__t4	20

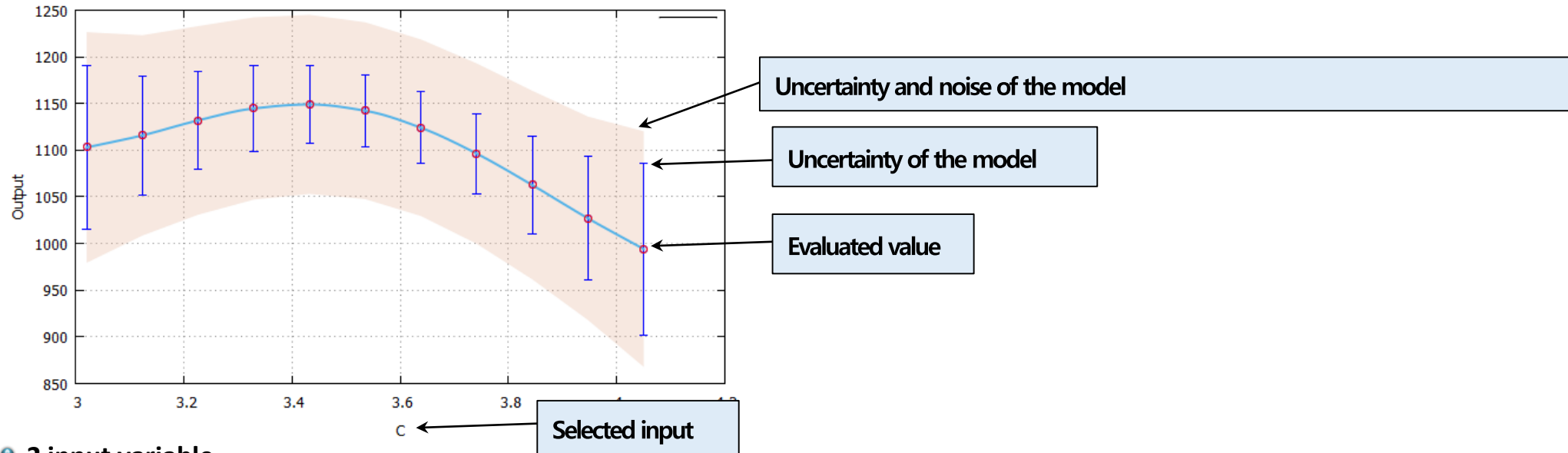
label	opt	model	target	weight
C	0	map/adi/map_adi_uts	1091.7	1
Si	0			
Mn	0			
Mo	0			
Ni	0			
Cu	0			
A-temp	0			
A-time	0			
auste...	0			
auste...	0			
log(au...	0			

Population: 100
Generation: 50

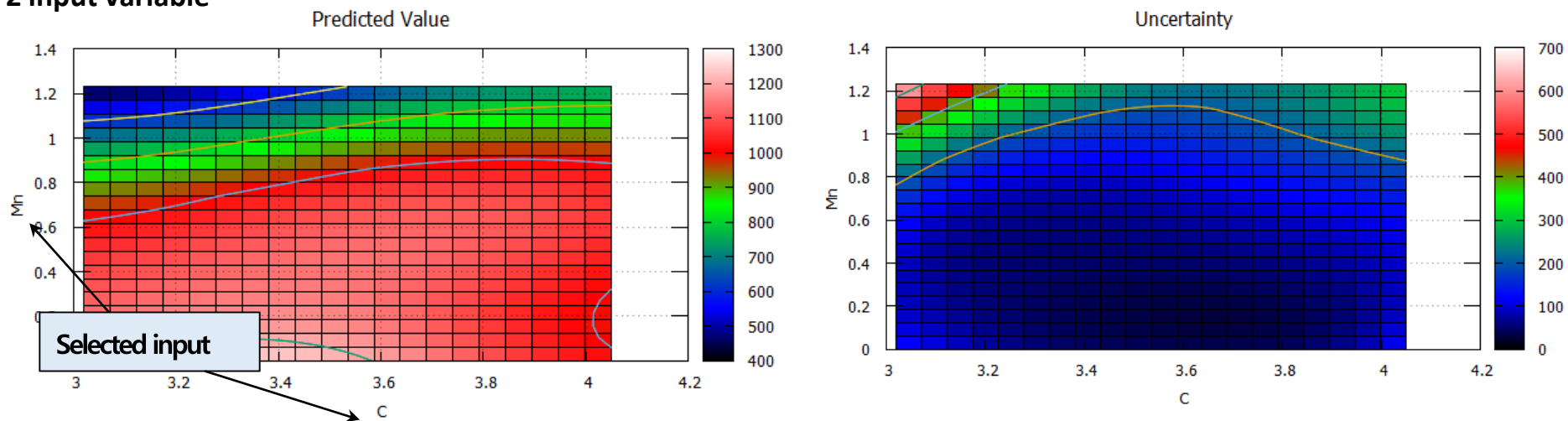
● Evaluate the value by changing the selected variable from “min” to “max” based on the “value” of the input variable.

- 1 input variable selected : 11 input sets
- 2 input variables selected : 11 x 11 input sets
- 3 input variables selected : 11 x 11 x 11 input sets

1 input variable

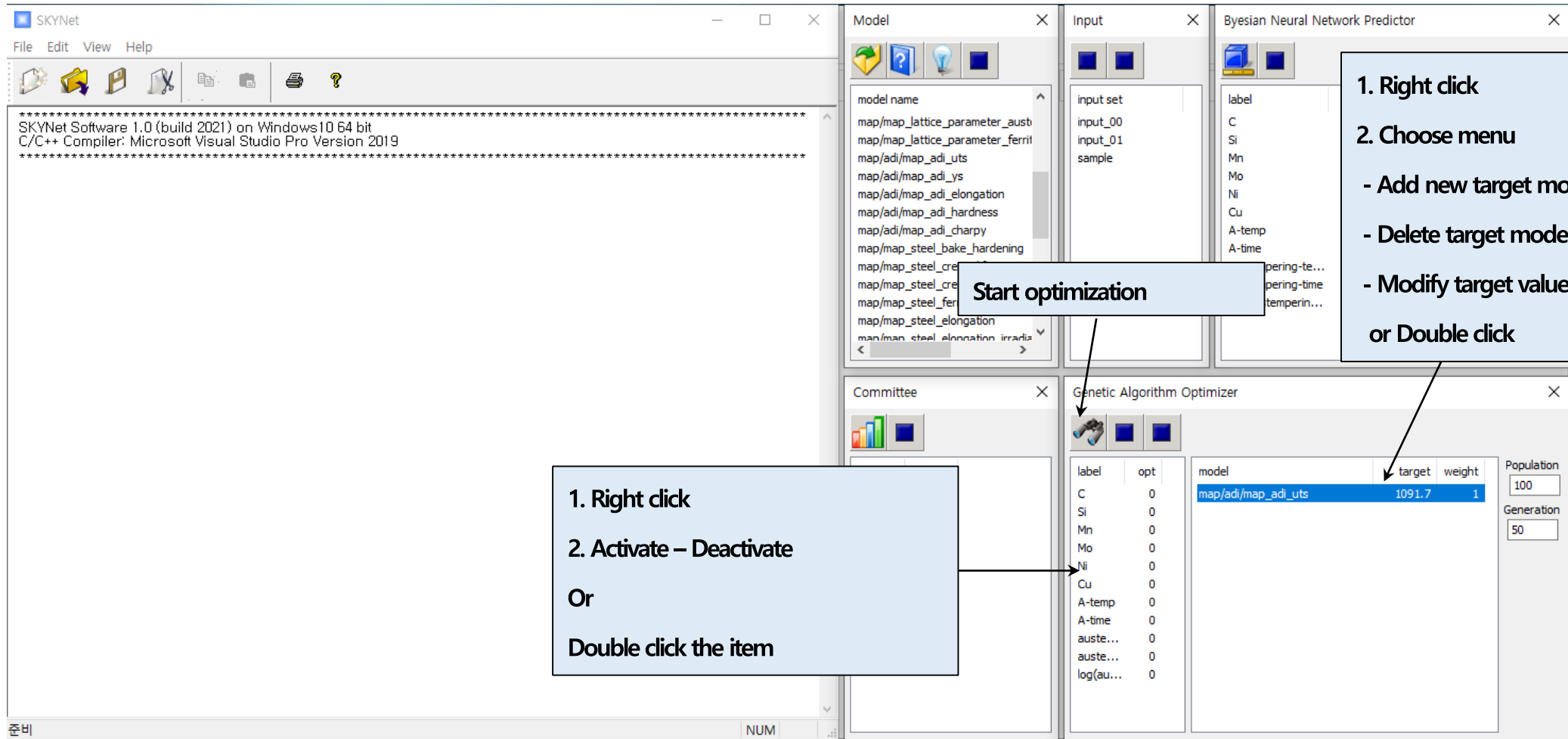


2 input variable



More than 3 input variable : calculation results are stored in CSV file.

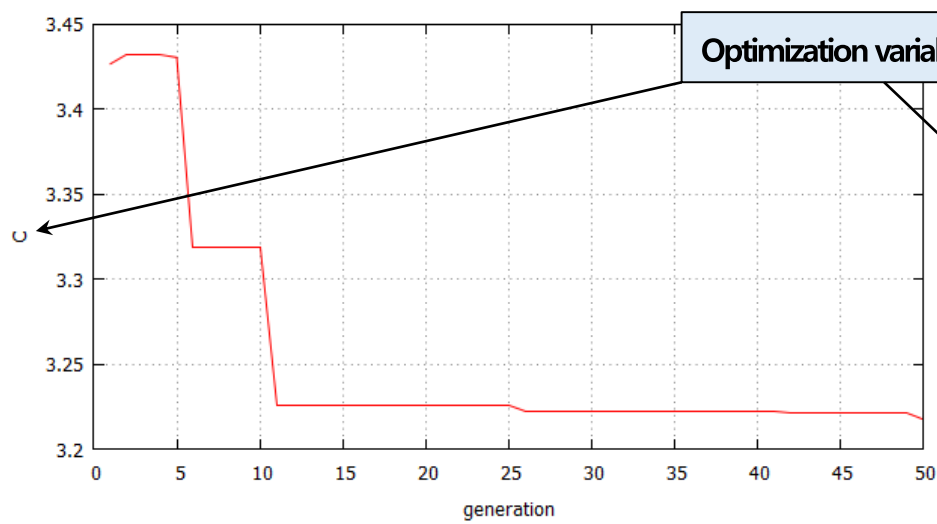
Optimizer Dialog



- Find the input variable value for each target model to be closest to the target value
 - optimization range : min, max, value in predictor dialog)
 - Distance : $\sum [\text{weight} \times (\text{calculated} - \text{target value})]^2$
- Optimized input conditions are automatically added to the input dialog.

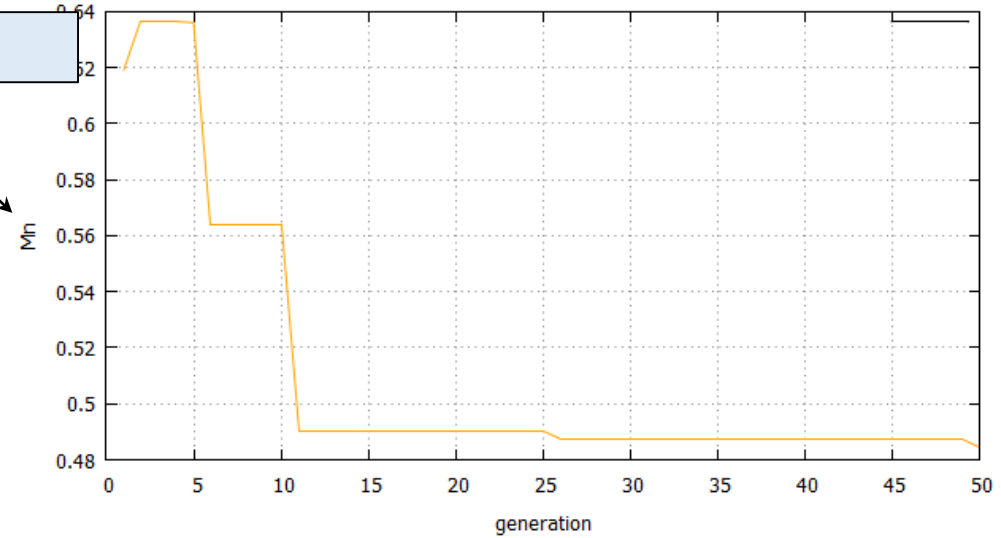
Optimizer Dialog

genetic algorithm optimization

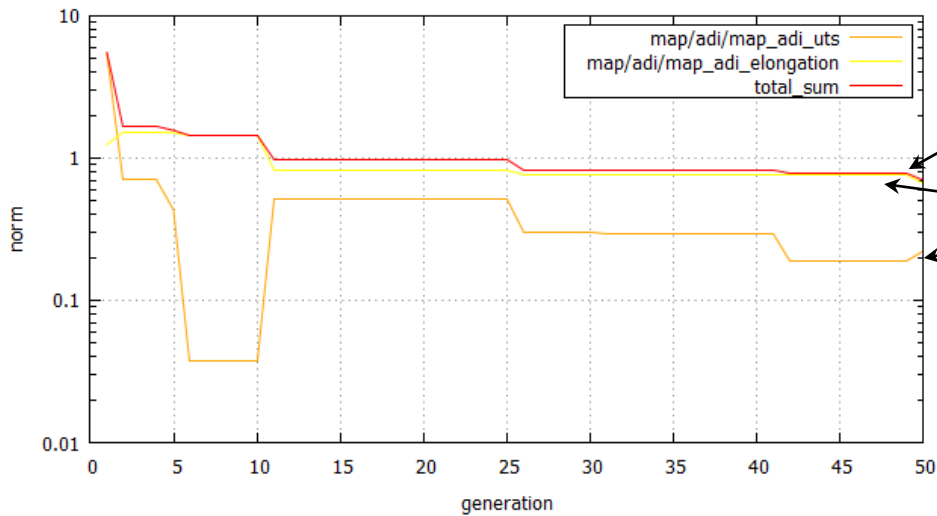


Optimization variable

genetic algorithm optimization



genetic algorithm optimization



Change of total distance according to each generation step

Distance between target and calculate value of each model