Historical Database for DynaMIT2.0

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Outline

1. Background
2. Implement
3. Test Result
4. Summary
5. Future work

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Starting point

The aim of the on–line calibration is to use the off–line calibrated parameter values as starting points and perform a local optimization step towards the unobserved true values[1].

Precise historical OD flow $=>$ Accurate estimated OD-flow

[1] Constantinos,A(2004) On–line Calibration for Dynamic Traffic Assignment

OD-Flow Analysis

Altered by many factors:

- rush hour
- weather
- holiday
- ...

Needs to be stratified under several tags

Insights

- Set up database for storage
- Update historical data with estimated data
- Provide best-fit historical flow

Goal

To design a program that can automatically **save** results from the DynaMIT simulation ,**update** the historical OD-flow and **render** proper demand input for the real-time DynaMIT simulation.

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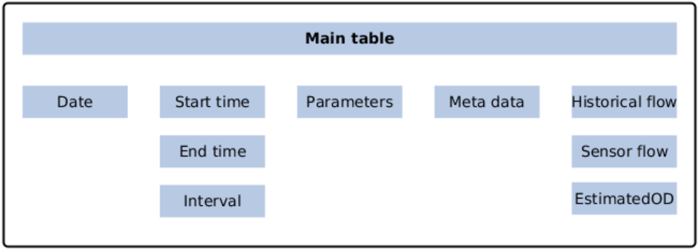
Functions

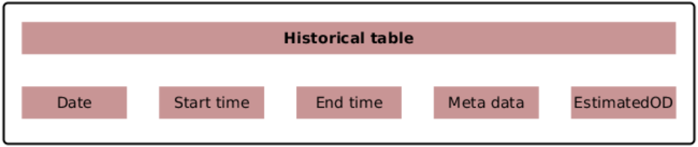
- Save DynaMIT input and output files to database
- Update the exist records in database
- Render best-fit historical data given by the input parameters of real-time DynaMIT simulation
- Auto-check and backup

Table definition



Main table

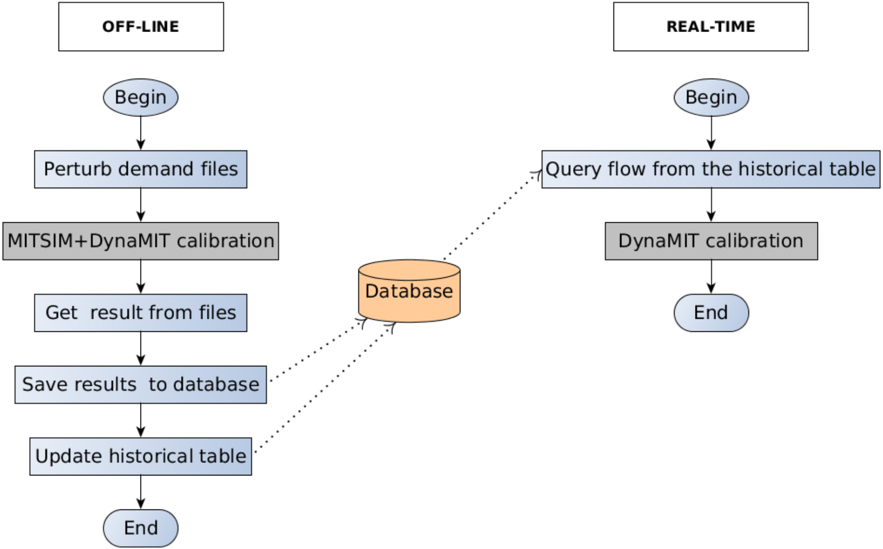
- Date
- Start time
- End time
- Interval
- Parameters
- Meta data
- Historical flow
- Sensor flow
- EstimatedOD



Historical table

- Date
- Start time
- End time
- Meta data
- EstimatedOD

Flow Diagram

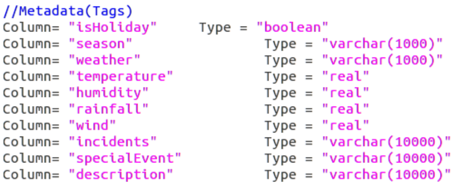


Project description

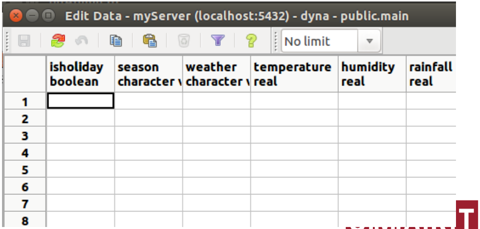
- Database: PostgreSQL
- Language:
  - Python (file operation)
  - Java (database I/D/U/Q)
  - Shell (whole process)

Setup process

- CREATE TABLE: database.config
- Framework parameter: params.config & init.sh
- Generate demands: demand_perturb.py



```
//Metadata(Tags)
Column= "isHoliday"      Type = "boolean"
Column= "season"                 Type = "varchar(1000)"
Column= "weather"                Type = "varchar(1000)"
Column= "temperature"            Type = "real"
Column= "humidity"               Type = "real"
Column= "rainfall"               Type = "real"
Column= "wind"                   Type = "real"
Column= "incidents"              Type = "varchar(10000)"
Column= "specialEvent"           Type = "varchar(10000)"
Column= "description"            Type = "varchar(10000)"
```



Edit Data - myServer (localhost:5432) - dyna - public.main

	isholiday boolean	season character v	weather character v	temperature real	humidity real	rainfall real
1						
2						
3						
4						
5						
6						
7						
8						

Insert process

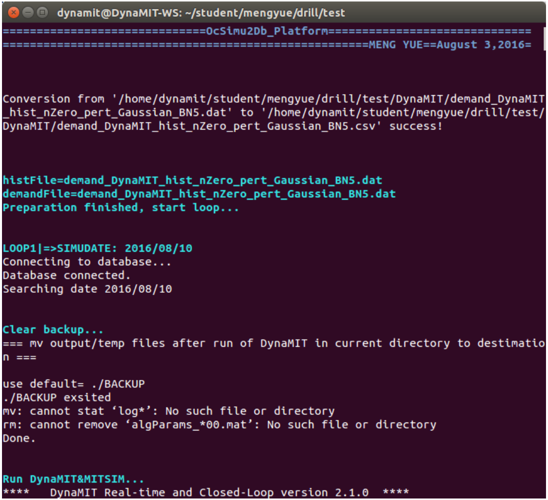
- dtaparam.dat
- behavior.dat
- supplyparam.dat
- sensor.out
- demand.dat
- estimatedOD*
- EOD.txt
- sen_flw_*
- sen_spd_*
- ...

Update process

Generate historical data process

SELECT estimatedOD FROM hod WHERE ...

Screen-shot(Start)



```
==============================OcSimu2Db_Platform==============================
======================================================MENG YUE==August 3,2016=



Conversion from '/home/dynamit/student/mengyue/drill/test/DynaMIT/demand_DynaMIT
_hist_nZero_pert_Gaussian_BN5.dat' to '/home/dynamit/student/mengyue/drill/test/
DynaMIT/demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.csv' success!



histFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
demandFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
Preparation finished, start loop...


LOOP1|=>SIMUDATE: 2016/08/10
Connecting to database...
Database connected.
Searching date 2016/08/10


Clear backup...
=== mv output/temp files after run of DynaMIT in current directory to destinatio
n ===

use default= ./BACKUP
./BACKUP exsited
mv: cannot stat ‘log*’: No such file or directory
rm: cannot remove ‘algParams_*00.mat’: No such file or directory
Done.


Run DynaMIT&MITSIM...
****   DynaMIT Real-time and Closed-Loop version 2.1.0   ****
```

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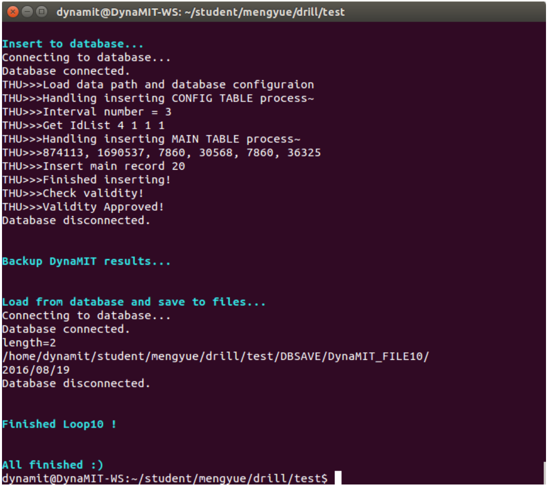
Screen-shot(End)

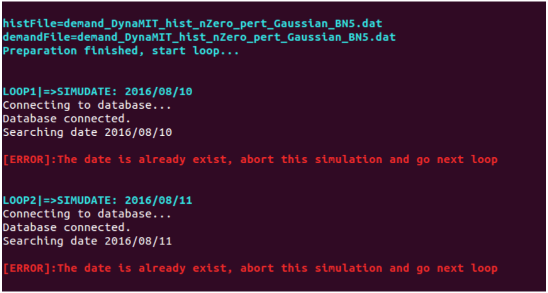


dynamit@DynaMIT-WS: ~/student/mengyue/drill/test

```
Insert to database...
Connecting to database...
Database connected.
THU>>>Load data path and database configuraion
THU>>>Handling inserting CONFIG TABLE process~
THU>>>Interval number = 3
THU>>>Get IdList 4 1 1 1
THU>>>Handling inserting MAIN TABLE process~
THU>>>874113, 1690537, 7860, 30568, 7860, 36325
THU>>>Insert main record 20
THU>>>Finished inserting!
THU>>>Check validity!
THU>>>Validity Approved!
Database disconnected.


Backup DynaMIT results...


Load from database and save to files...
Connecting to database...
Database connected.
length=2
/home/dynamit/student/mengyue/drill/test/DBSAVE/DynaMIT_FILE10/
2016/08/19
Database disconnected.


Finished Loop10 !


All finished :)
dynamit@DynaMIT-WS:~/student/mengyue/drill/test$
```

Screen-shot(Error)

Check for conflict primary key DATE



```
histFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
demandFile=demand_DynaMIT_hist_nZero_pert_Gaussian_BN5.dat
Preparation finished, start loop...


LOOP1|=>SIMUDATE: 2016/08/10
Connecting to database...
Database connected.
Searching date 2016/08/10

[ERROR]:The date is already exist, abort this simulation and go next loop


LOOP2|=>SIMUDATE: 2016/08/11
Connecting to database...
Database connected.
Searching date 2016/08/11

[ERROR]:The date is already exist, abort this simulation and go next loop
```

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Test

Result

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Conclusion

- Run simulation and recording automatically
- Easy to debug and add new tags for database
- Potential value

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Future work

- Find source for the metadata
- Use XXX algorithm for ”update process”
- Use XXX algorithm for ”render historical data”
- Refactoring & Documentation

Question

Any questions?

Thank you!