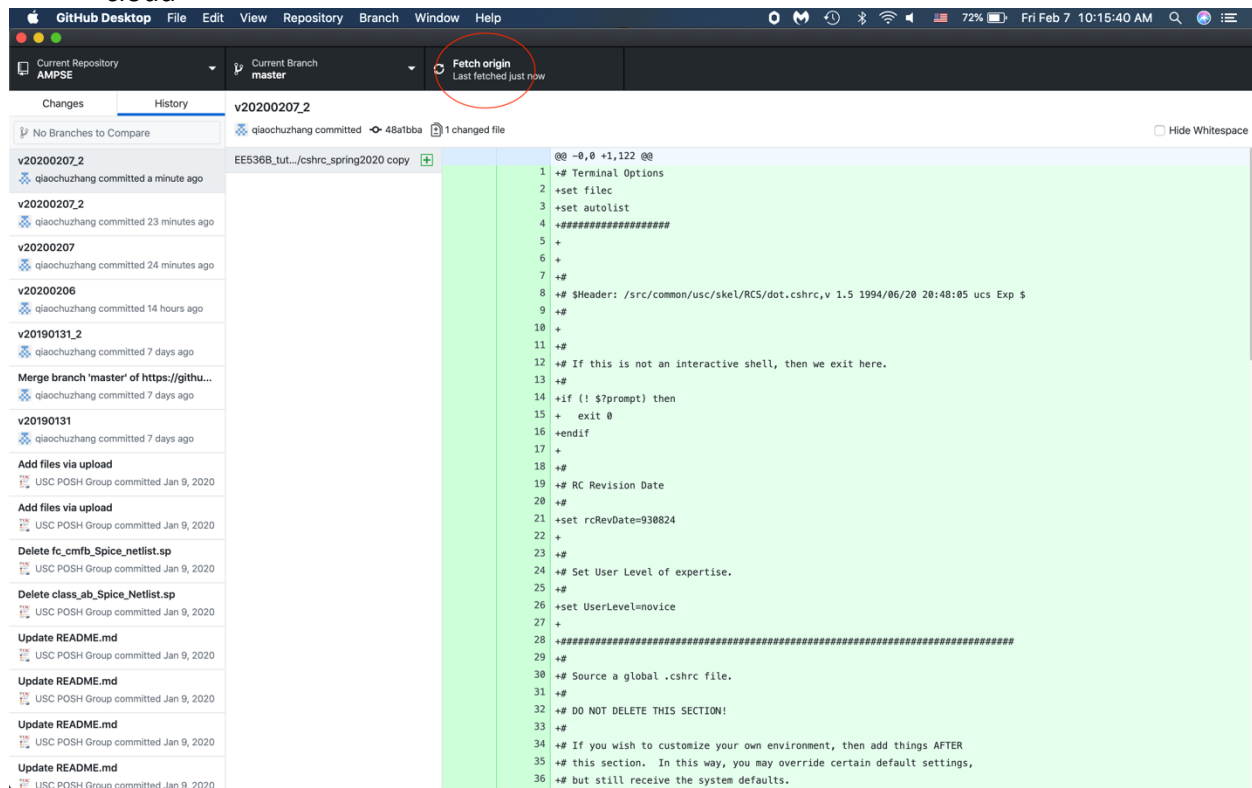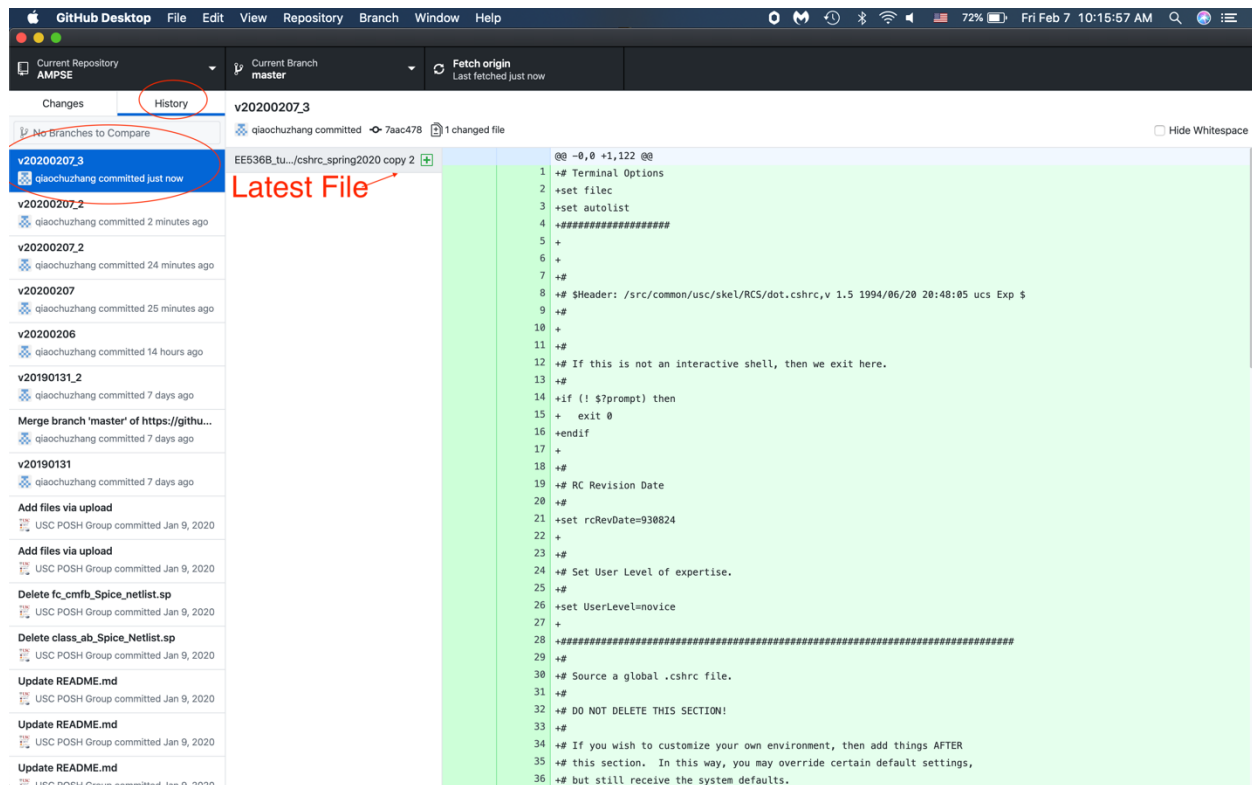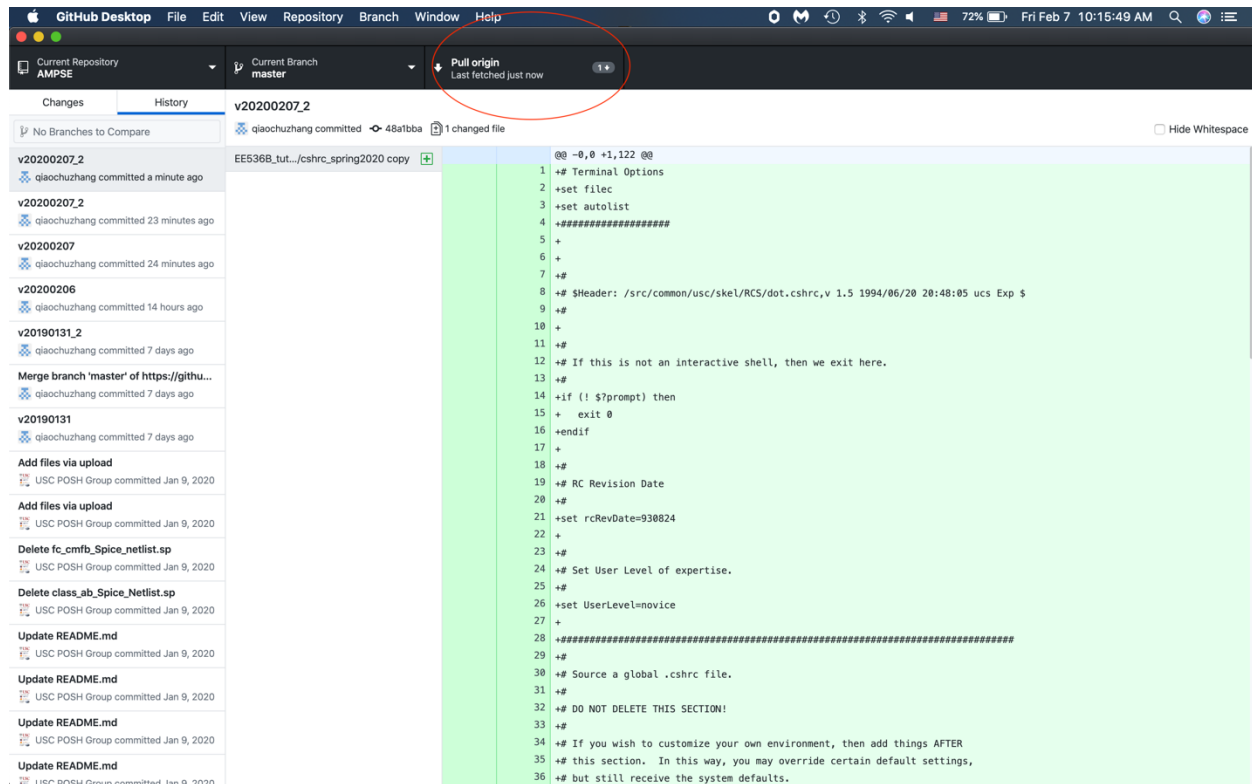# AMPSE Tutorial (dataset generation, based on Ring oscillator example)

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1. Download the workarea from GitHub and copy to your server/laptop.
   - Download GitHub desktop from https://desktop.github.com/, and install it
   - Clone the repo AMPSE from GitHub using GitHub desktop via https://github.com/USCPOSH/AMPSE.git
   - You can update the repo using GitHub desktop whenever there is any change on the cloud

- Remember to update spectreIOlib.py to the latest version. Please check if function search_oceanEval_result_row_number() exists in the script.

- Upload /workarea_POSH to your Viterbi server home folder
2. Draw your circuit schematic in Cadence Virtuoso, and decide your design parameters by entering it in schematics
3. Export your parameterized netlist.
    - Open ADE L
    - Click simulation → Netlist →Display
    - Save your netlist to the folder. /workarea_POSH/RO_ee536b/netlists_sanitized
    - Save the calculate expression of the design metrics to a text file
4. Open your netlist, at the end of the netlist, write down the expression of the design metrics. The format is as following:

export metric = oceanEval("expression")

The main form of the expression is exported from calculator in Cadence Virtuoso ADE. Instead of directly use the expression, we need to modify the directory of raw simulation data. For example, the expression of transient voltage of net1 in Virtuoso ADE Calculator is:

VT("/net1")

Here we need to change the form to:

v("net1" ?result "tran" ?resultsDir "/home/username/workarea_POSH/RO_ee536b/temp/tb_inv/test.raw")

Example: Inverter delay
The expression in Virtuoso ADE Calculator is:

cross(VT("/_net0")0.5 1 \"falling\" nil nil)-cross(VT("/_net1") 0.5 1 \"rising\" nil nil)"

The expression here should be:

export delay=oceanEval("cross(v(\"_net0\" ?result \"tran\" ?resultsDir \"/home/qiaochuz/workarea_POSH/RO_ee536b/temp/tb_inv/test.raw\") 0.5 1 \"falling\" nil nil)-cross(v(\"_net1\" ?result \"tran\" ?resultsDir \"/home/qiaochuz/workarea_POSH/RO_ee536b/temp/tb_inv/test.raw\") 0.5 1 \"rising\" nil nil)")

5. Open the script netlist_database.py, change the script by following the instruction in the comments
6. Open your terminal at ./workarea/RO_ee536b, run netlist_database.py by typing:
python netlist_database.py
7. Gather your dataset in the folder /datasets and enjoy your life!