GLM

Grid Search

Predict **7th** neuron

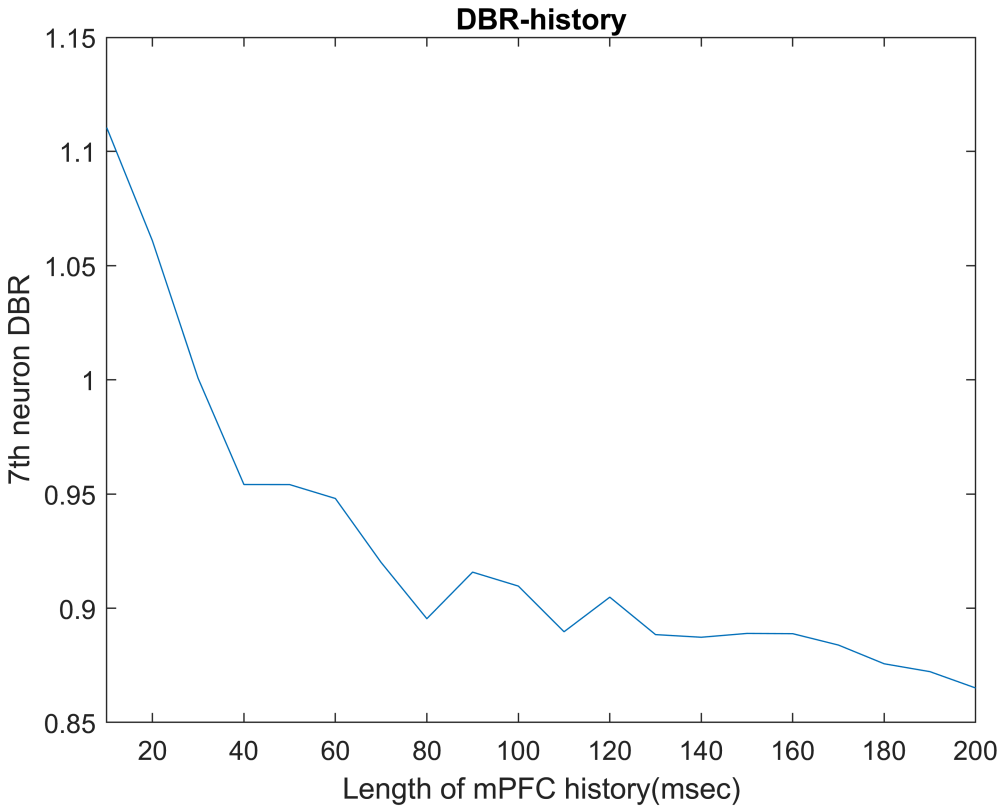
regulization parameter **alpha** almost useless, might be useful when **xi** is lare and **alpha** is quite small(0~0.1). Use 0 first.

H larger likely be better. xi need not explore a lot.

```
13/40:Train Complete...L:-14512.8585 ...H:1 ...xi:0.1 ...alpha:0
      Test Complete...L:-15906.1425 ...DBR:1.1104
13/40:Train Complete...L:-14444.7714 ...H:2 ...xi:0.1 ...alpha:0
      Test Complete...L:-15886.4774 ...DBR:1.0608
13/40:Train Complete...L:-14373.0838 ...H:3 ...xi:0.1 ...alpha:0
      Test Complete...L:-15894.7013 ...DBR:1.0006
13/40:Train Complete...L:-14309.5116 ...H:4 ...xi:0.1 ...alpha:0
      Test Complete...L:-15881.5739 ...DBR:0.95414
13/40:Train Complete...L:-14272.1896 ...H:5 ...xi:0.1 ...alpha:0
      Test Complete...L:-15886.7835 ...DBR:0.95411
13/40:Train Complete...L:-14226.7988 ...H:6 ...xi:0.1 ...alpha:0
      Test Complete...L:-15896.25 ...DBR:0.94802
13/40:Train Complete...L:-14202.341 ...H:7 ...xi:0.1 ...alpha:0
      Test Complete...L:-15902.2839 ...DBR:0.92002
13/40:Train Complete...L:-14187.9798 ...H:8 ...xi:0.1 ...alpha:0
      Test Complete...L:-15922.1014 ...DBR:0.8954
13/40:Train Complete...L:-14166.3912 ...H:9 ...xi:0.1 ...alpha:0
      Test Complete...L:-15927.367 ...DBR:0.91579
13/40:Train Complete...L:-14153.3451 ...H:10 ...xi:0.1 ...alpha:0
      Test Complete...L:-15931.0016 ...DBR:0.90968
13/40:Train Complete...L:-14143.3399 ...H:11 ...xi:0.1 ...alpha:0
      Test Complete...L:-15934.0691 ...DBR:0.88969
13/40:Train Complete...L:-14128.5051 ...H:12 ...xi:0.1 ...alpha:0
      Test Complete...L:-15933.2935 ...DBR:0.90482
13/40:Train Complete...L:-14114.4996 ...H:13 ...xi:0.1 ...alpha:0
      Test Complete...L:-15933.5207 ...DBR:0.88844
13/40:Train Complete...L:-14108.0456 ...H:14 ...xi:0.1 ...alpha:0
      Test Complete...L:-15933.5826 ...DBR:0.88728
13/40:Train Complete...L:-14102.551 ...H:15 ...xi:0.1 ...alpha:0
      Test Complete...L:-15934.4101 ...DBR:0.88895
13/40:Train Complete...L:-14094.9988 ...H:16 ...xi:0.1 ...alpha:0
      Test Complete...L:-15942.2677 ...DBR:0.88884
13/40:Train Complete...L:-14088.4859 ...H:17 ...xi:0.1 ...alpha:0
      Test Complete...L:-15946.1341 ...DBR:0.88386
13/40:Train Complete...L:-14079.6939 ...H:18 ...xi:0.1 ...alpha:0
      Test Complete...L:-15963.2854 ...DBR:0.87566
13/40:Train Complete...L:-14078.9744 ...H:19 ...xi:0.1 ...alpha:0
      Test Complete...L:-15973.0689 ...DBR:0.87222
13/40:Train Complete...L:-14082.9756 ...H:20 ...xi:0.1 ...alpha:0
      Test Complete...L:-15981.88 ...DBR:0.86506
```

Result analyze

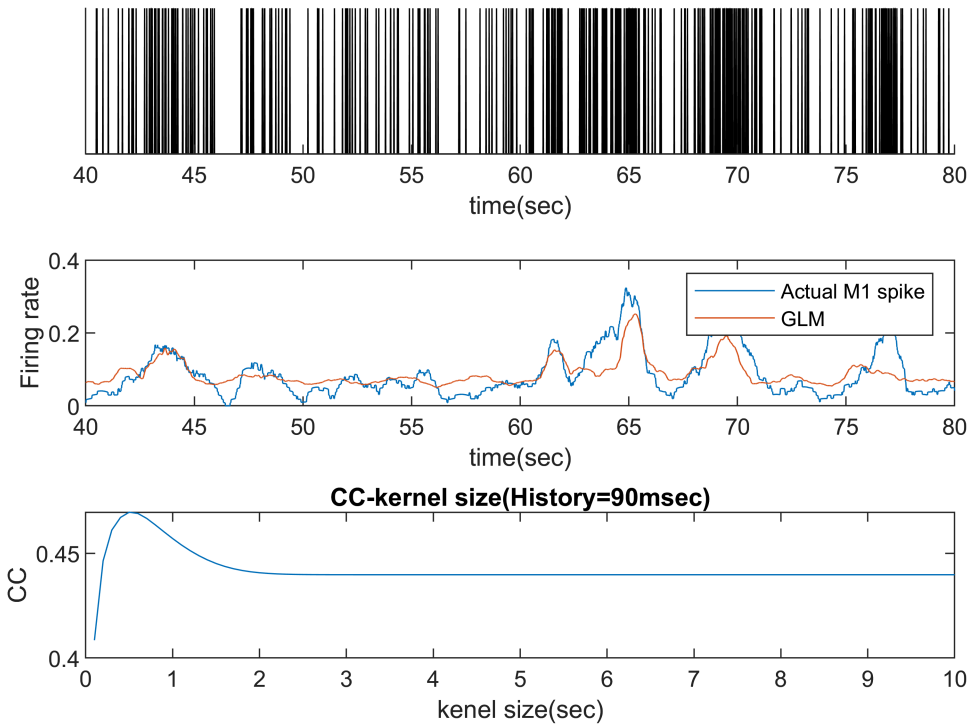
DBR-history



firing rate, cc kernel size analyze

Take history=9 for firing rate cc-kernel size analyze, kernel size changes from 10~1000(*10msec)

take kernel size=50(0.5s) for plot


40
45
50
55
60
65
70
75
80
time(sec)
0.4
0.2
0
Firing rate
Actual M1 spike
GLM
40
45
50
55
60
65
70
75
80
time(sec)
CC-kernel size(History=90msec)
0.45
0.4
CC
0
1
2
3
4
5
6
7
8
9
10
kenel size(sec)