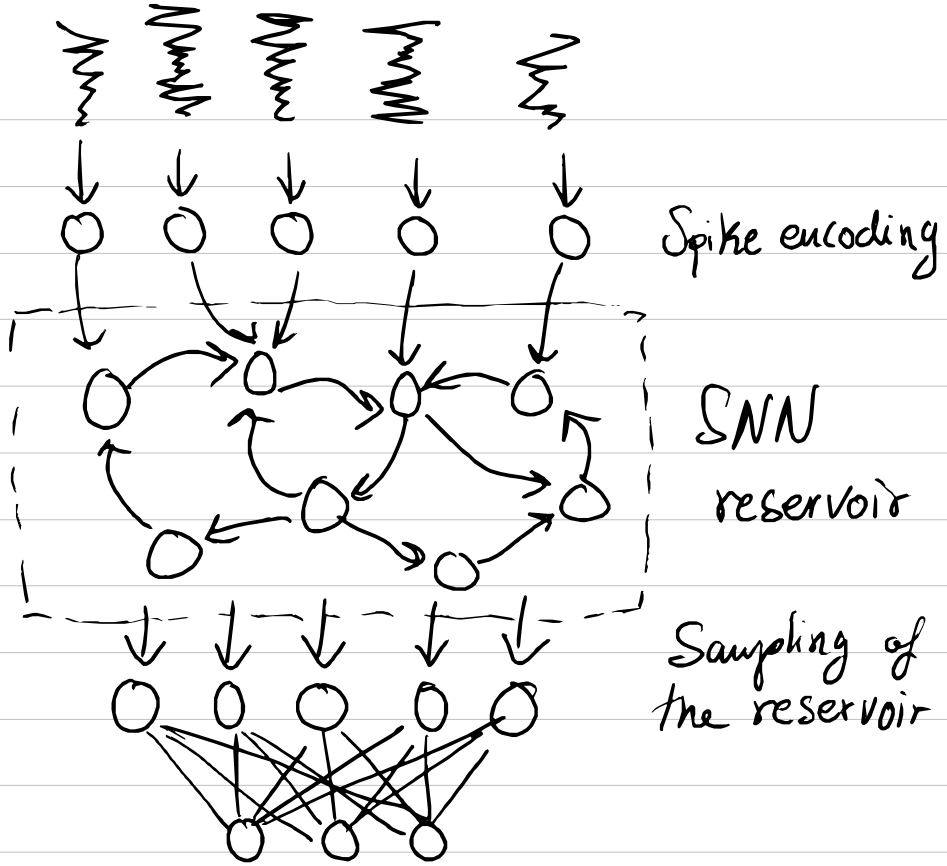
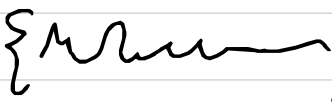

Spike encoding
SNN
reservoir
Sampling of
the reservoir

# Student project

- Duration: 7 - 14 weeks.
- Description. → Milestones, goals. (Modular)
- Own gitlab repo for student project
- Overleaf. → Project description.
- Slack / Mattermost.

$\{M, X, T\} \rightarrow \quad 2^3 = 8$

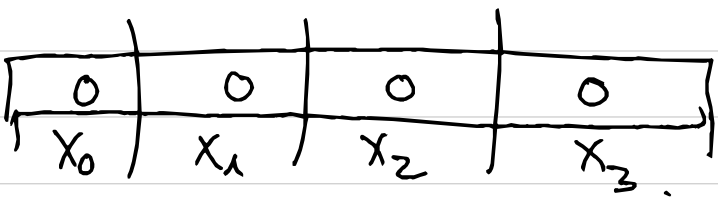
● ○ ○

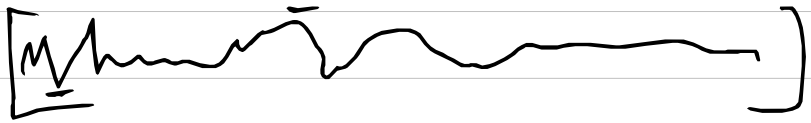
{  } ⟶ {○○○}.

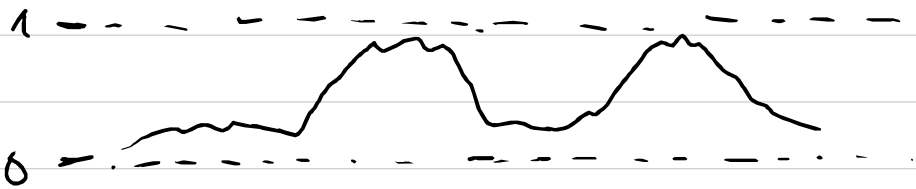
0 = $\{X_0, M_0, T_0\}$

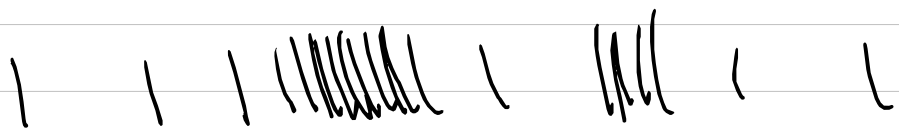
(1) = $\{X_1, M_0, T_0\} \rightarrow X_1$.

2 =

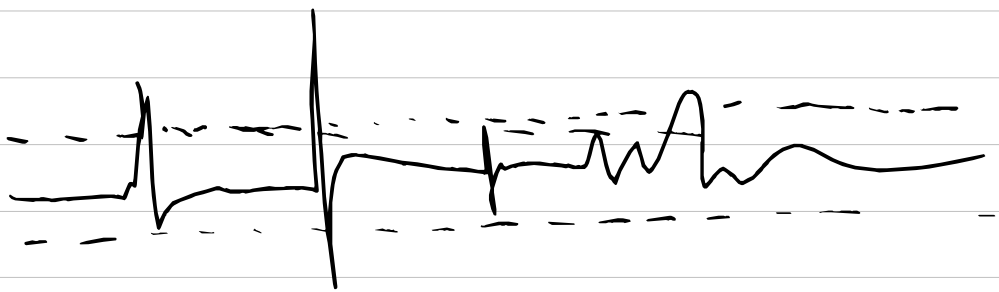


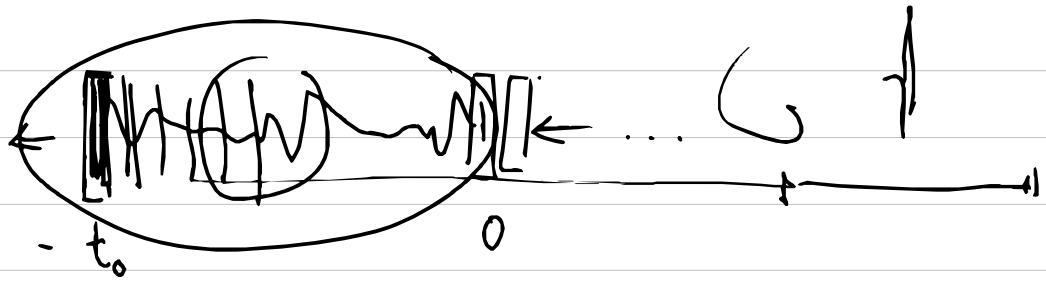




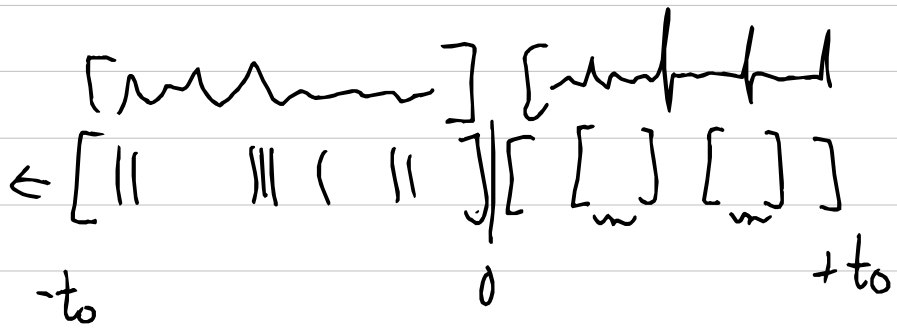
$R_{max}$, $R_{min}$.






$\{M, X, T\}$

$\{M_0, X_1, T_2\}$.



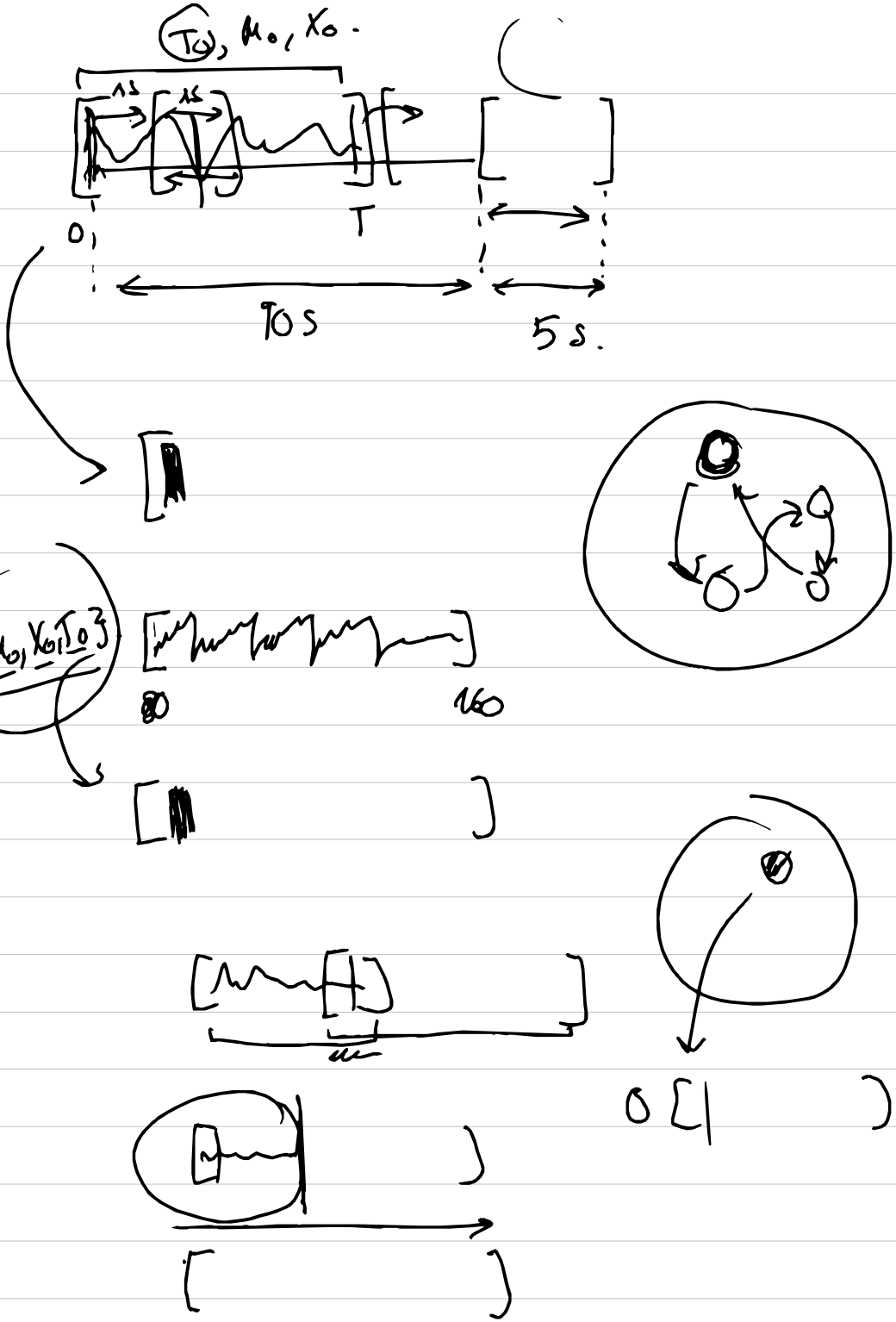

$\{M_0, X_1, T_2\}$ → [ | ]

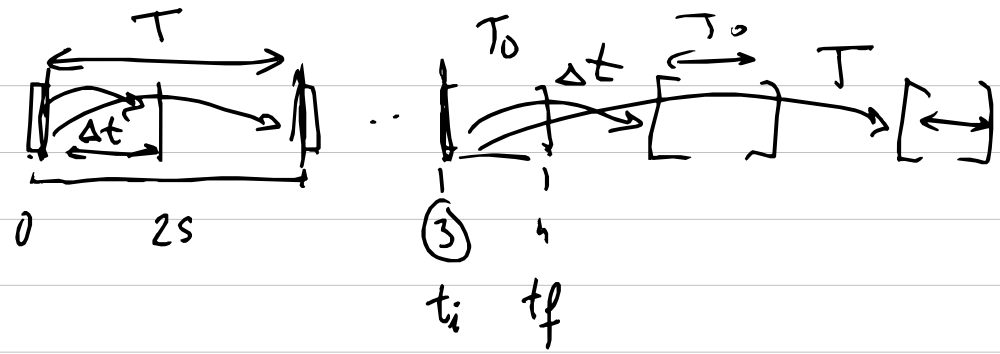
$\{M_1, X_0, T_1\}$ → [ ]

⋮

0 $t_0$

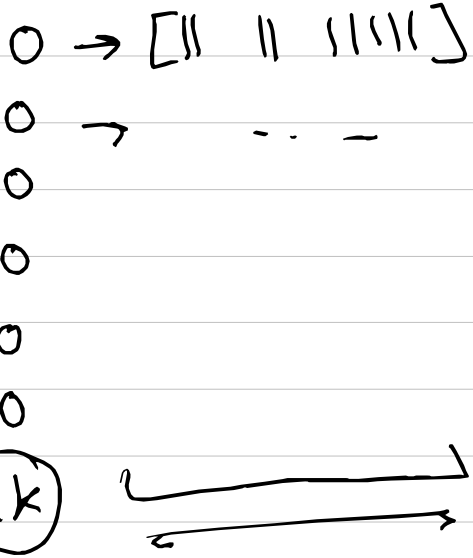
16 × 40,000.

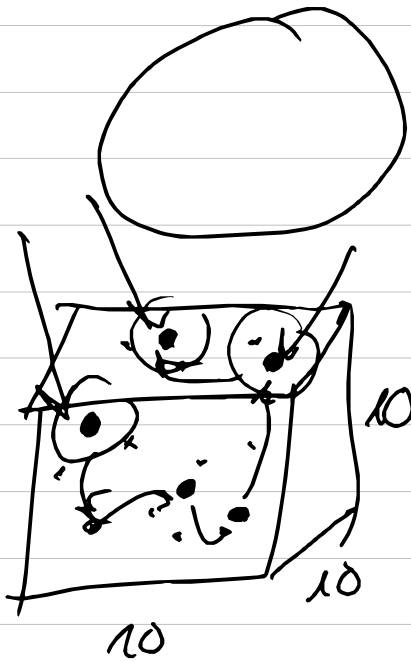

T0, M0, X0.
0
T
T0 s
5 s.
{M0, X0, T0}
80
160



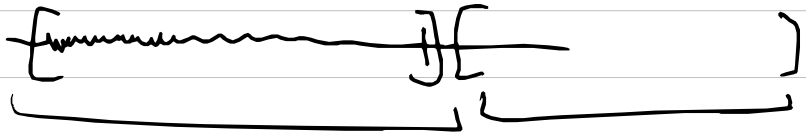

$$\left[ t_i \rightarrow T + (t_f - t_i) \right]$$

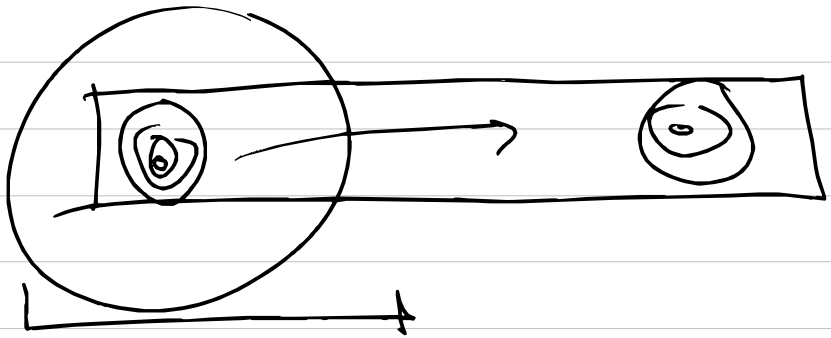
## NeuCube



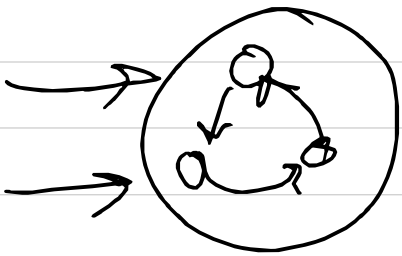



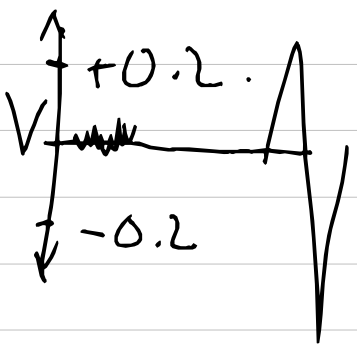

1000 neurons

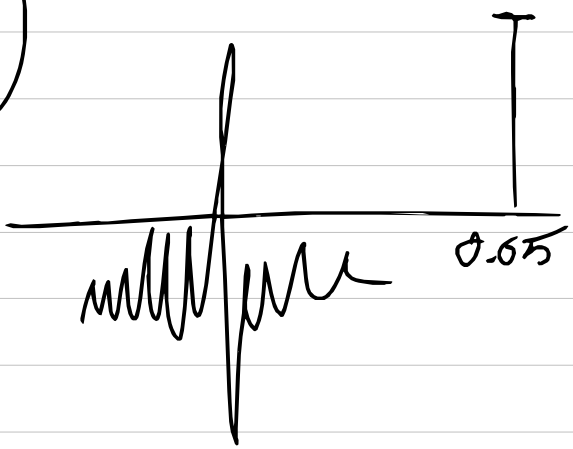


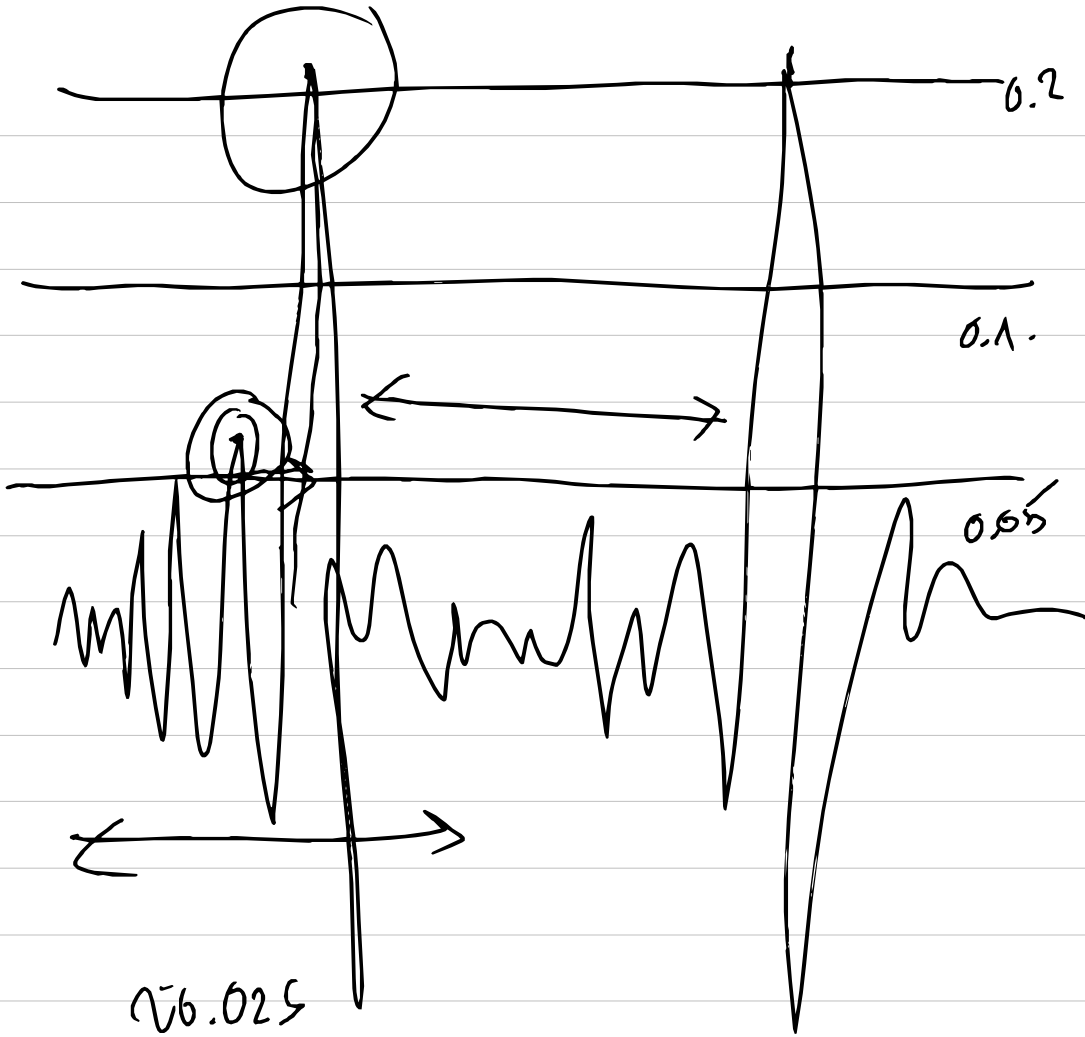


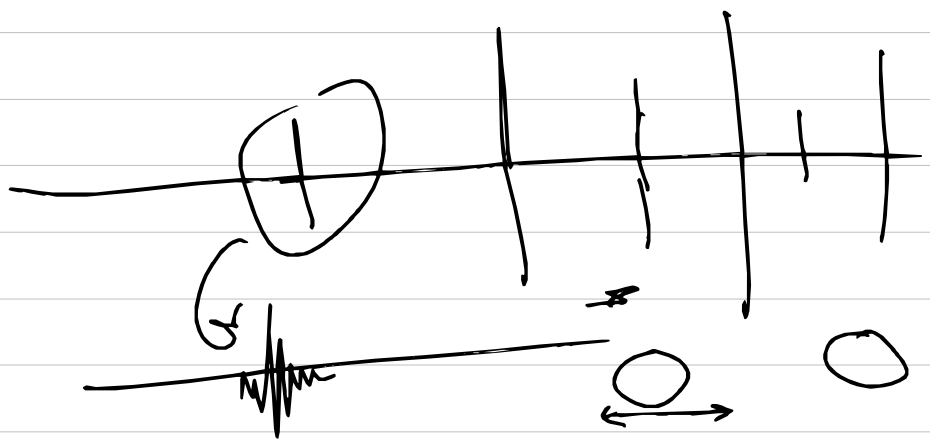
Ground truth.
Spikes.



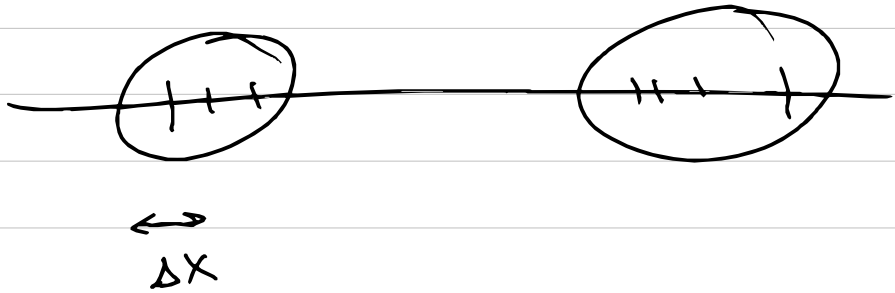


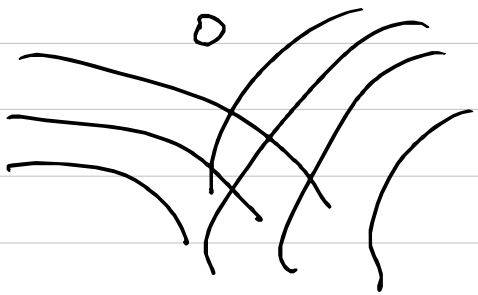




0.2
0.1.
0.05
~0.025



0.05 → find_peaks.





5000 → 50

50 Hz

100s batches.

0.0002

1

5000

500 Hz and 500

200 s. x 5000 = 1,000,000

20,000 data points in 4 batches.
of 4,000 points.

50 points is 1 s.

4 s × 50 = 200 points per batch.

---

2M → resampling 50 Hz → 20k.

↳ 4 s × 50 → 200

$\frac{2k}{20} = 100$

# TO DO

1. identify - events → make sure that the peaks are capturing

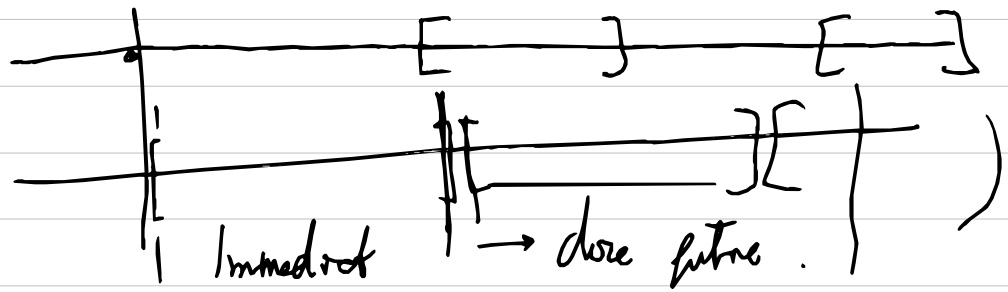
↳ events_per_batch.

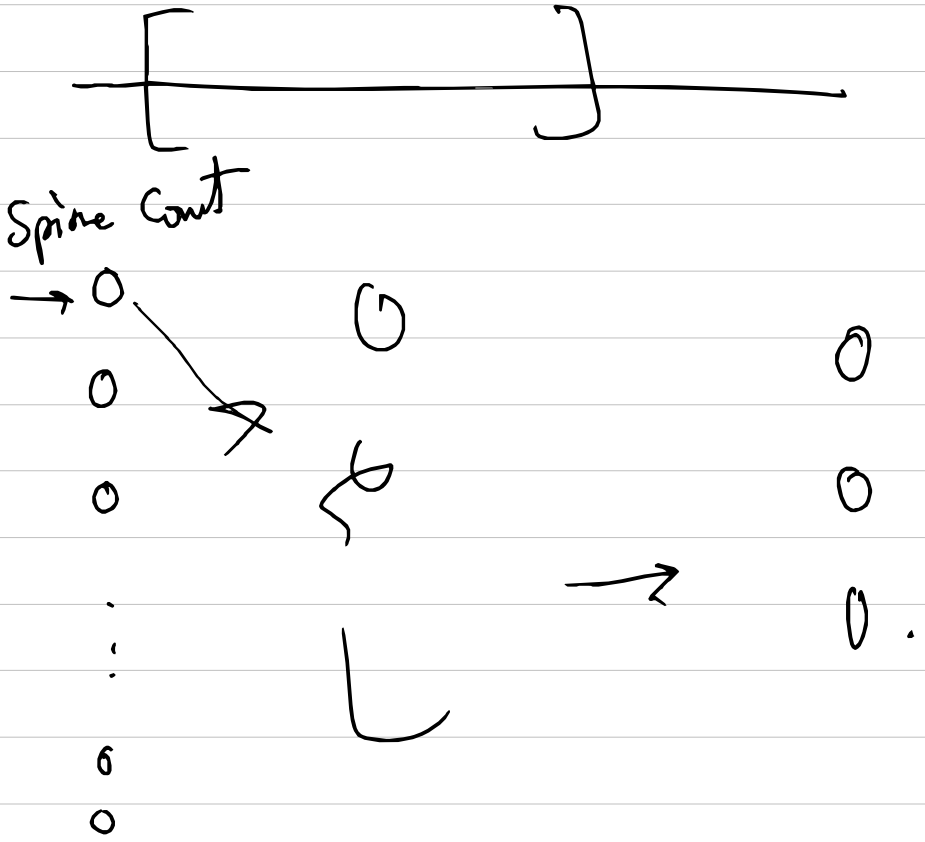
batch ⟶ events.

2. generate - grand_truth - spks.

↳ Based on time horizon.
take the appropriate batches.

45 batches. → Time horizons: 1. Next second.
2. From 1s to 4s.




Spine Count
16 x 200