

Effect of Noise on the Connectivity and Dynamics of Large-Scale Spiking Neuron Networks (SNN)

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work performed during the

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under the tutorship of

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BUZZWORDS

- spiking neuron network (SNN)
- spike timing dependent plasticity (STDP)
- development plasticity
- precise firing sequences (PFS)
- synfire chains

- build a large network with a lot of connections

THE IDEA

2

- build a large network with a lot of connections
- base pruning of connections on an STDP rule

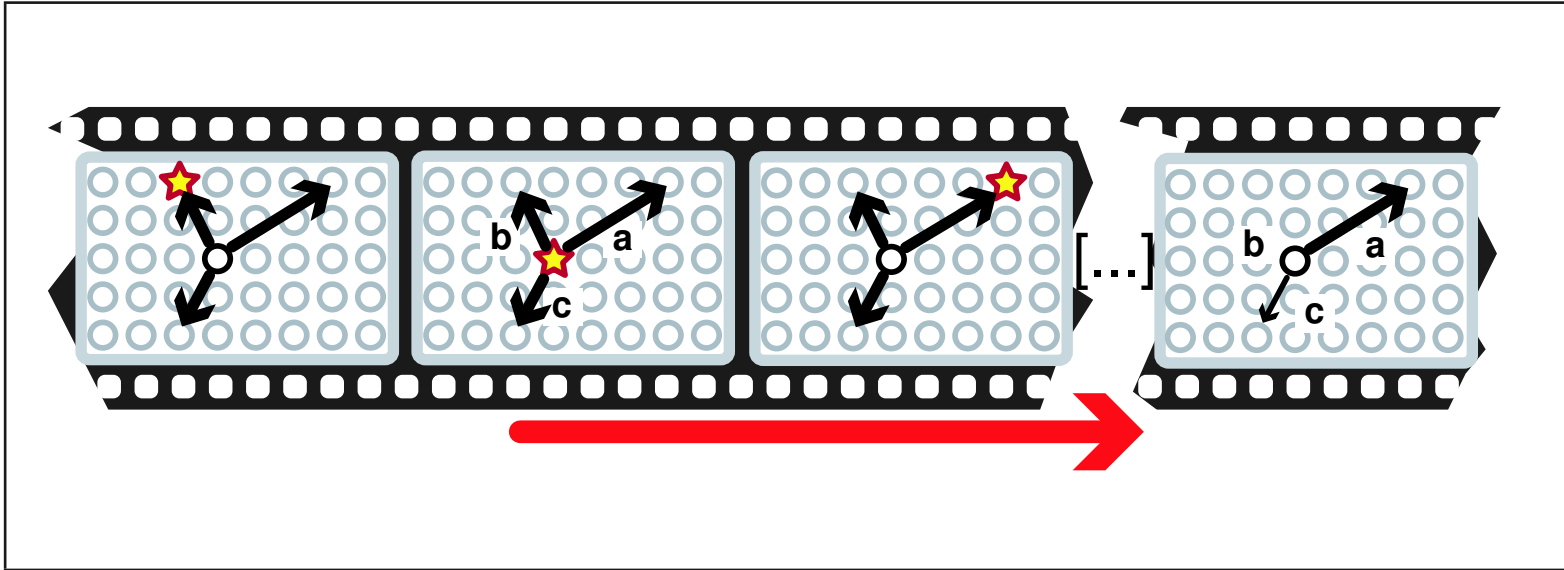
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- bootstrap the search for emerged synfire chains

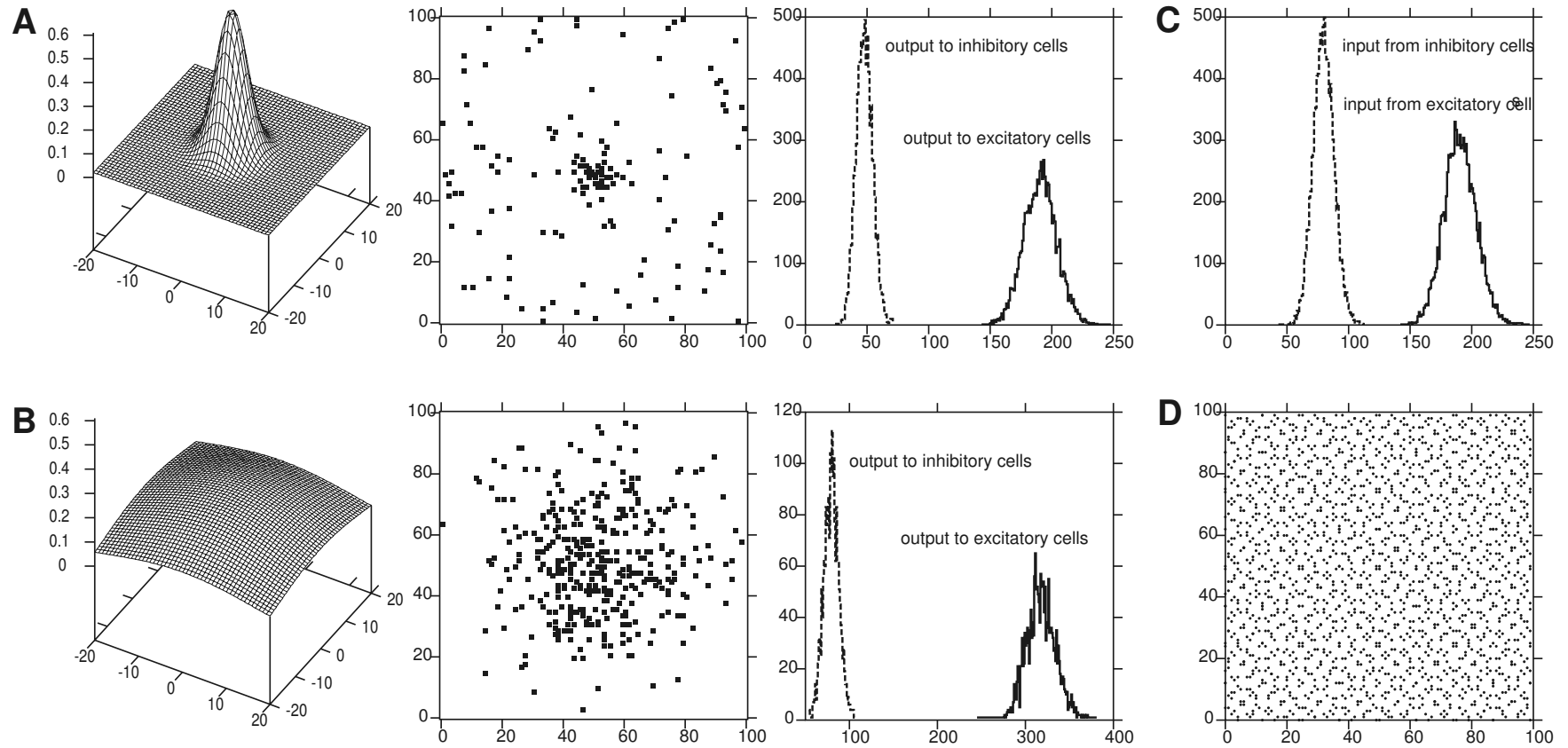
THE IDEA



INFRASTRUCTURE: the *Squid Ghost*



CONNECTIONS



- subthreshold membrane ($V_i(t) < \theta$) :

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$$YD_i(t + \Delta t) = k_{learn} \cdot YD_i(t)$$

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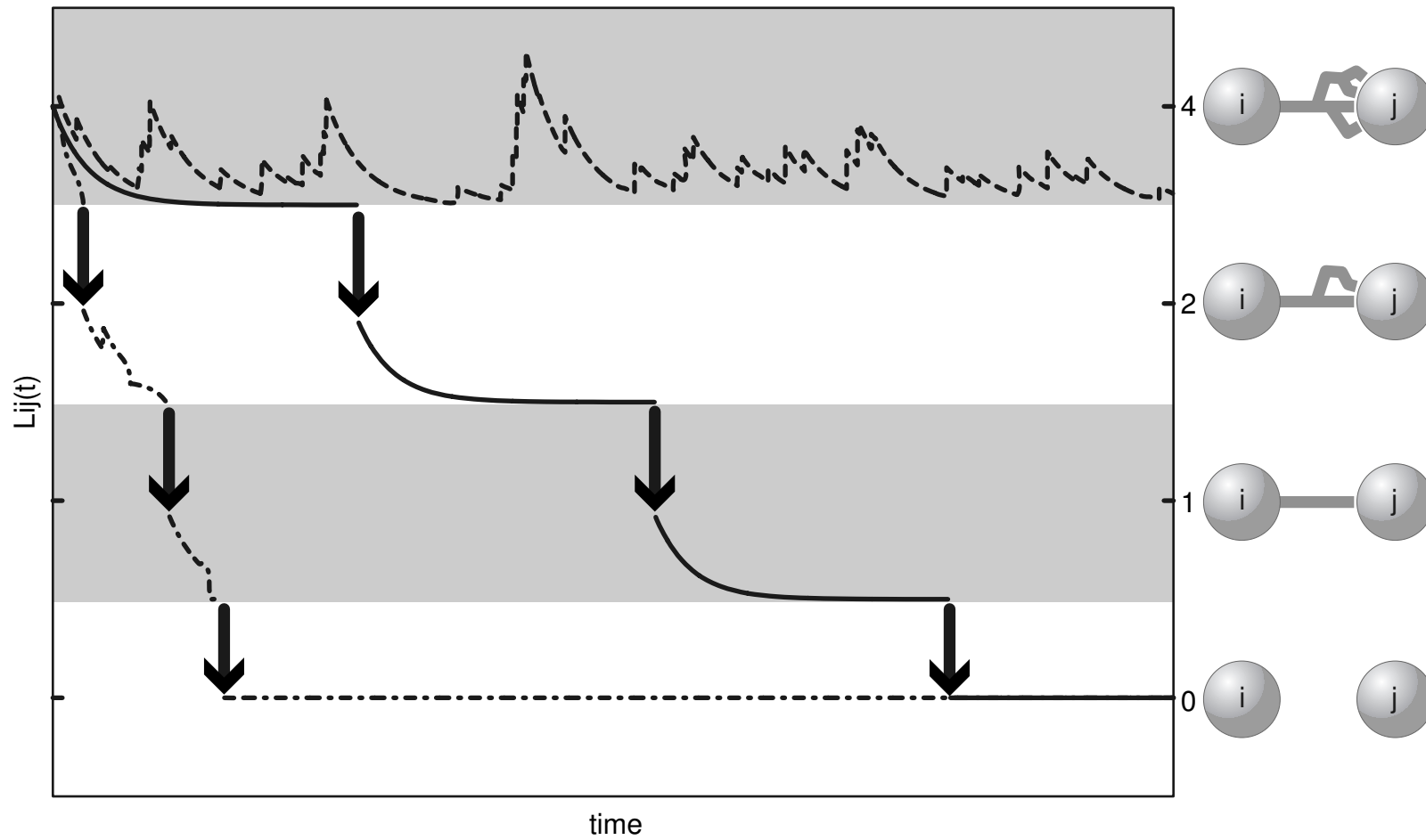
$$V_i(t + \Delta t) = V_{rest}$$

$$S_i(t) = 1$$

$$YD_i(t + \Delta t) = YD_{MAX}$$

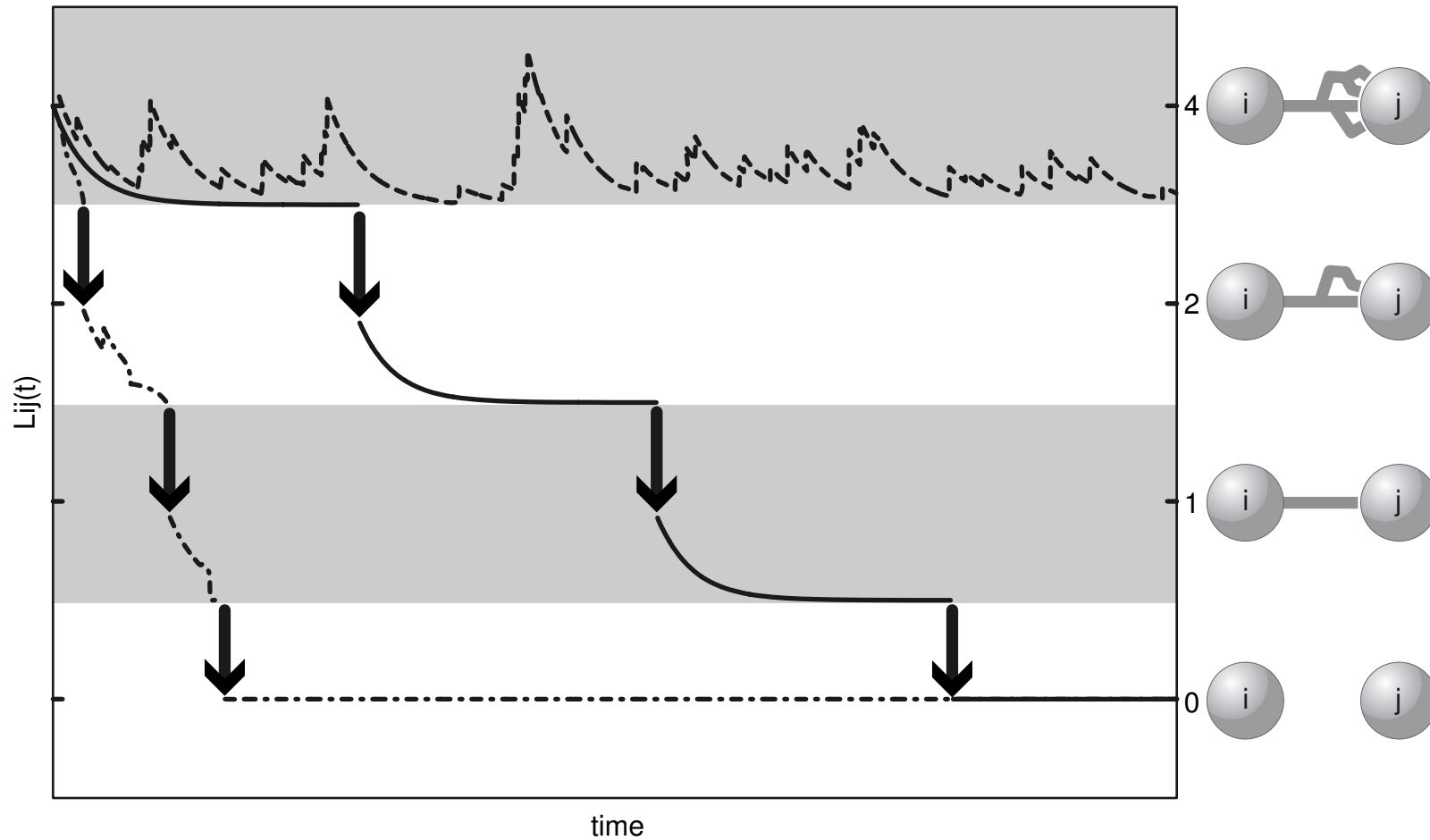
LEARNING

$$L_{ij}(t + \Delta t) = k_{act} \cdot L_i(t)$$

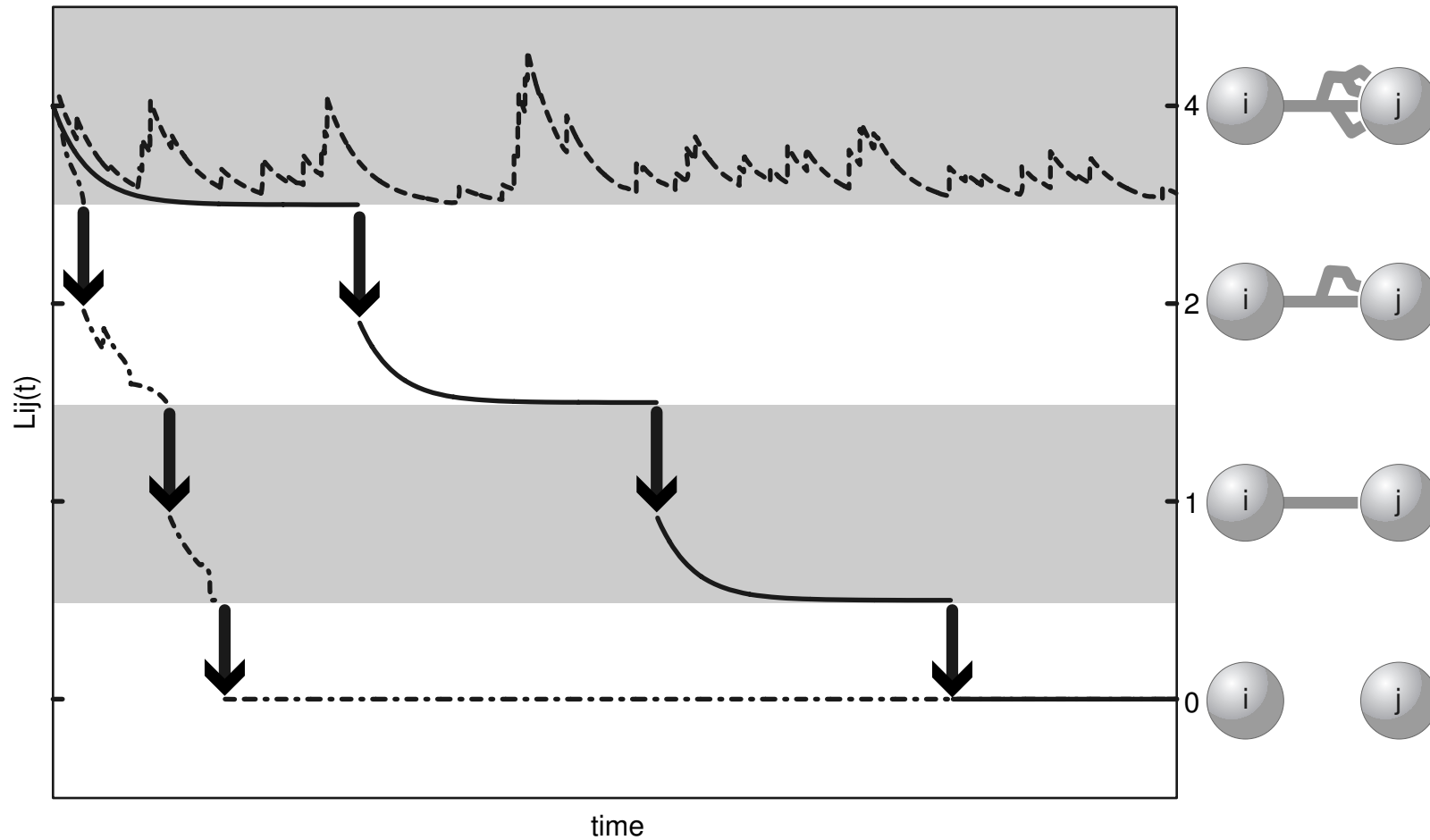


LEARNING

$$L_{ij}(t + \Delta t) = k_{act} \cdot L_i(t) + (Y D_i(t) \cdot S_j(t))$$



$$L_{ij}(t + \Delta t) = k_{act} \cdot L_i(t) + (YD_i(t) \cdot S_j(t)) - (YD_j(t) \cdot S_i(t))$$



$$\mathcal{R} \rightarrow \mathcal{M}$$

$$\text{Obidos}(\textit{student}) \rightarrow \text{results}$$

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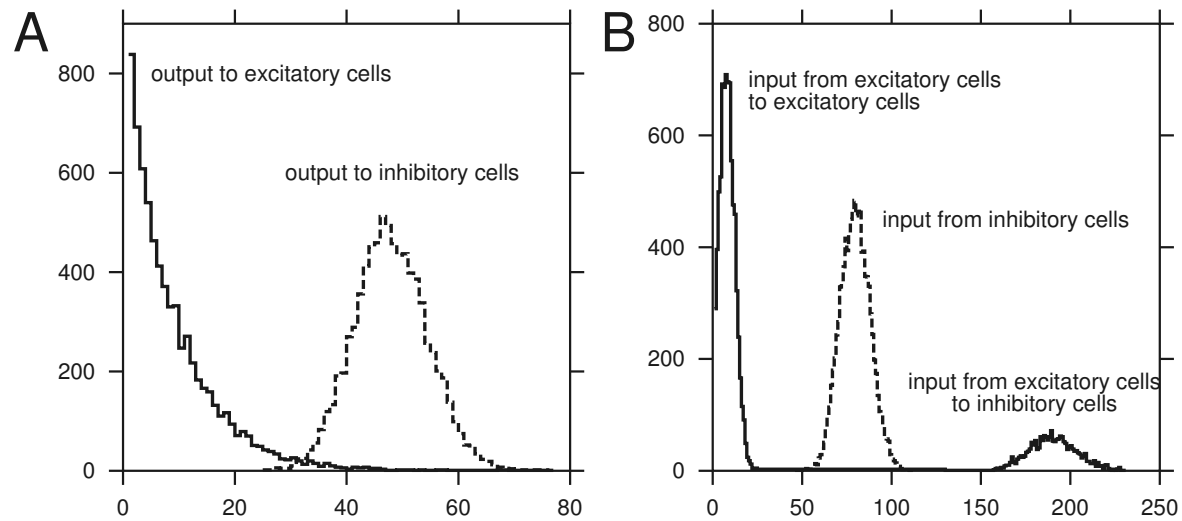
Obidos(*iglesias*) \rightarrow \sim nothing

IT COULD BE WORST

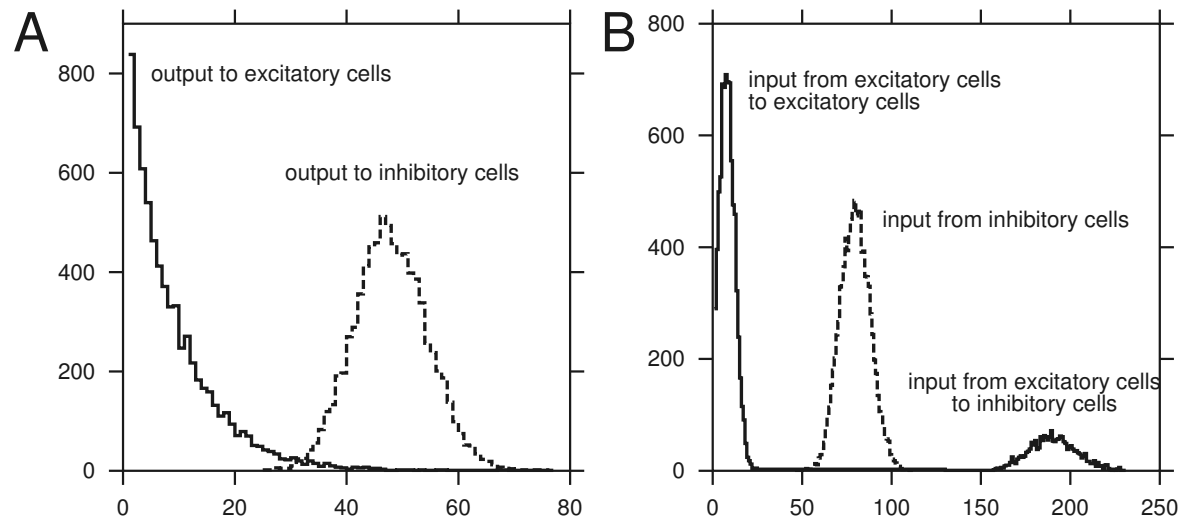


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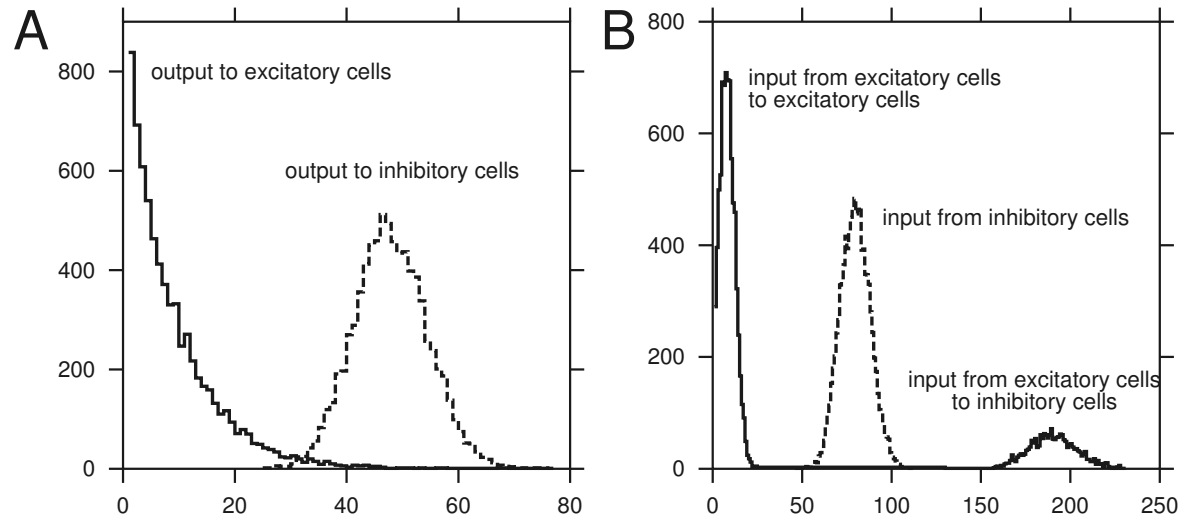


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- investigate the possibility to prime synfire chains

- September 6th :

WHAT'S NEXT

11

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find an italian restaurant and have pasta

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- end of 2004 :
PhD ?