

Supplementary File 2

A: Populations		
Name	Value	Description
N^E	8000	Excitatory population size in each module
N^I	2000	Inhibitory population size in each module
B: Connectivity		
Name	Value	Description
ϵ	0.1	Baseline connection probability
α	0.25	Connection scaling factor for $SSN_{i>0}$
p_x	ϵ	Connection probability for background noise input in SSN_0
	$\alpha\epsilon$	Scaled connection probability for background input in $SSN_i, i > 0$
σ_i	$(1 - \alpha) * \epsilon$	Fixed density of feed-forward projection matrices
p_c	$(1 - m) * p_0$	Feed-forward connection probability within topographic maps
p_0	$(1 - m) * p_c$	Feed-forward connection probability between SPs on different topographic maps
B: Neuron Model		
Name	Value	Description
C_m	250 pF	Membrane capacitance
E_L	-70 mV	Resting membrane potential
τ_m	20 ms	Membrane time constant
V_{th}	-55 mV	Membrane potential threshold for action-potential firing
V_{reset}	-60 mV	Reset potential
τ_{ref}	2 ms	Absolute refractory period
C: Synapse Model		
τ_E	2 ms	Synaptic decay time constant for excitatory synapses
τ_I	2 ms	Synaptic decay time constant for inhibitory synapses
d	1.5 ms	Synaptic transmission delay
\hat{I}_E	32.78 pA	Peak excitatory current
\hat{I}_I	$g32.78$ pA	Peak inhibitory current
J_E	0.2 mV	EPSP amplitude
J_I	$g0.2$ mV	IPSP amplitude
g	-12	Scaling factor for the inhibitory synapses

Table 2: Summary of all the model parameters for the current-based network. For more details, see [\[15\]](#).