

# Sequence-JOIN Progress Update

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March 11, 2024

This is to document our current progress in developing Sequence-JOIN (SJOIN). We have created a new process to better account for the cascading effect that firing one  $r$ -sized memory can have on a realistic Neuroidal model.

## Current Algorithmic Formulation

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**Algorithm:** Sequence-JOIN for  $l$ -sized Sequences

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**Input:** The Neuroidal model  $G$ , initial memory  $A$ , and the sequence length  $l$ .

**Output:** An updated  $G$ , along with the vector of total, chained memories  $L$ .

**Algorithm** SequenceJOIN( $G = (V, E), A, l$ ):

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  for all synapses  $\{i, j\}$  in  $E$  do
     $w_{ij} \leftarrow 0$ 
   $L \leftarrow (A)$ 
  for  $m = 1, 2, \dots, l$  do
    for all neurons  $i$  in  $L_m$  do
       $f_i \leftarrow 1$ 
       $B \leftarrow \emptyset$ 
       $k_2 \leftarrow 2 \cdot k_G$ 
      for  $k_{test} = k_2, k_2 - 1, k_2 - 2, \dots, k_G$  do
        for all synapses  $\{i, j\}$  in  $L_m$  do
           $w_{ij} \leftarrow \frac{T_i}{k_{test}}$ 
        UpdateNeuroids( $G$ )
         $B_{test} \leftarrow \emptyset$ 
        for each neuron  $i$  in  $V$  do
          if  $q_i == 2$  then
             $B_{test} \leftarrow B_{test} \cup i$ 
        if  $|B_{test}| \sim r_G$  then
           $B \leftarrow B_{test}$ 
          for all synapses  $\{i, j\}$  in  $A$  do
            if  $j$  is not in  $B$  then
               $w_{ij} \leftarrow 0$ 
          break
        if InterferenceCheck( $L, B$ ) then
          return  $G, L$ 
        else
           $L \leftarrow (L, B)$ 
  return  $G, L$ 
```

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