We are building a model of visual working memory (VWM).

The Binding Pool model is a mechanistic model that accounts for both the quality and quantity of representations in VWM.

Model components:
- Tokens index stored representations as object-files
- Types represent a stimulus’ features
- The Binding Pool is a shared resource pool of distributed representations in which multiple stimuli are stored

Encoding:
- One token is activated per item
- Encoding is serial
- Types and tokens both project to the binding pool
- Binding pool nodes receiving convergent input are activated
  The activated nodes store the connection between active Type and Token nodes

Types
- Neural Unit
- Bidirectional connection
- Randomized weights
- No synaptic modification
- Storage of information occurs through sustained activity in the binding pool

Types
- Stimulus

Binding pool
- Tokens

Stimulus

Continuous report task
- As set size increases, the model’s retrieval variability and the chance of swap and guessing errors increase

Change detection task
- Each item in the probe display is compared to the retrieved item at that location
- The probability of the model reporting a ‘change’ is dependent upon the magnitude of change
- As set size increases, the model’s performance degrades

There are two forms of capacity in the Binding Pool model:
- **Fixed capacity of information storage:** the quality of all memories is dependent upon the size of the binding pool.
- **Variable number of items:** The quantity of items stored per trial is variable: reflecting attentional fluctuations and encoding duration.

The precision of each memory trace results from the combination of these two limits on each trial. These limits enable the model to simulate existing data and generate predictions.