# Notations (common)

Each row is the recording for neuron , , Denote the cluster index for neuron as . The number of neurons in cluster is , and . The proportion/ probability in cluster is .

# Mixture Model (MM)

The number of cluster is for MM. The full likelihood for these neurons is

Where is all parameters in cluster defined by the model. The model details & likelihood can be found in “models” folder, and model XXX is named as “MCMC\_XXX”.

The parameters need to update:

1. Cluster indicator:
2. Cluster proportion:
3. Model parameters:

The (conditional) priors:

1. Cluster indicator :
2. Cluster proportion :

Where

MCMC iteration:

1. Update :
2. Update
3. Update :

See details of the chosen model in “~/documents/models/MCMC\_XXX.docx”. when there’s no , just sample from prior.

# Dirichlet Process (DP)

Use slice sampler (Walker 2007, <https://www.tandfonline.com/doi/full/10.1080/03610910601096262>).

Represent cluster proportion by “stick-breaking”, i.e.

The parameters need to update:

1. “stick-breaking” elements:
2. Augment latent variable:
3. Model parameters:
4. Cluster indicator:

MCMC iteration:

1. update , for as
2. update
3. update , for . is the smallest value, s.t.
4. update state vectors

See details of the chosen model in “~/documents/models/MCMC\_XXX.docx”. when there’s no , just sample from prior.

1. Update