**Hierarchical Dirichlet Processes**

**Definition of Hierarchical Dirichlet Process (HDP)**: nonparametric Bayesian method for modeling grouped data where each group is represented by a mixture model, but mixture components can be shared across groups

**Difference to Classical Dirichlet Processes (DP)?** Sharing of topics.

**Hierarchical structure**:

* Global DP generates a set of shared mixture components
* Each group-specific DP draws from the global DP, ensuring that groups can use the same components but with different proportions

This structure naturally induces shared clustering across groups without fixing the number of clusters in advance.

**Chinese Restaurant Franchise (CRF):** A metaphor extending the Chinese Restaurant Process to multiple restaurants (groups) that share a common menu (global clusters).

**Markov Chain Monte Carlo (MCMC)** algorithms (including Gibbs sampling and direct assignment methods) for posterior inference.