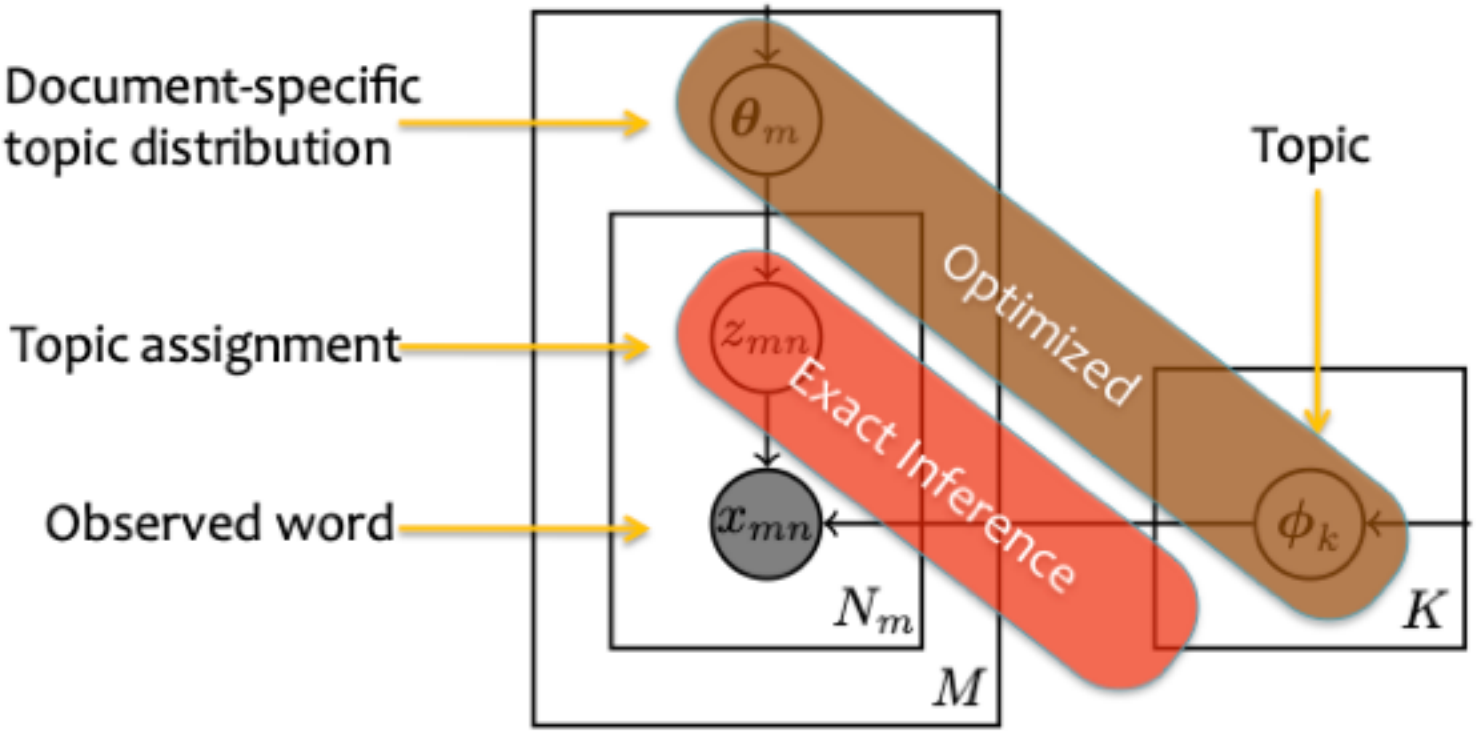
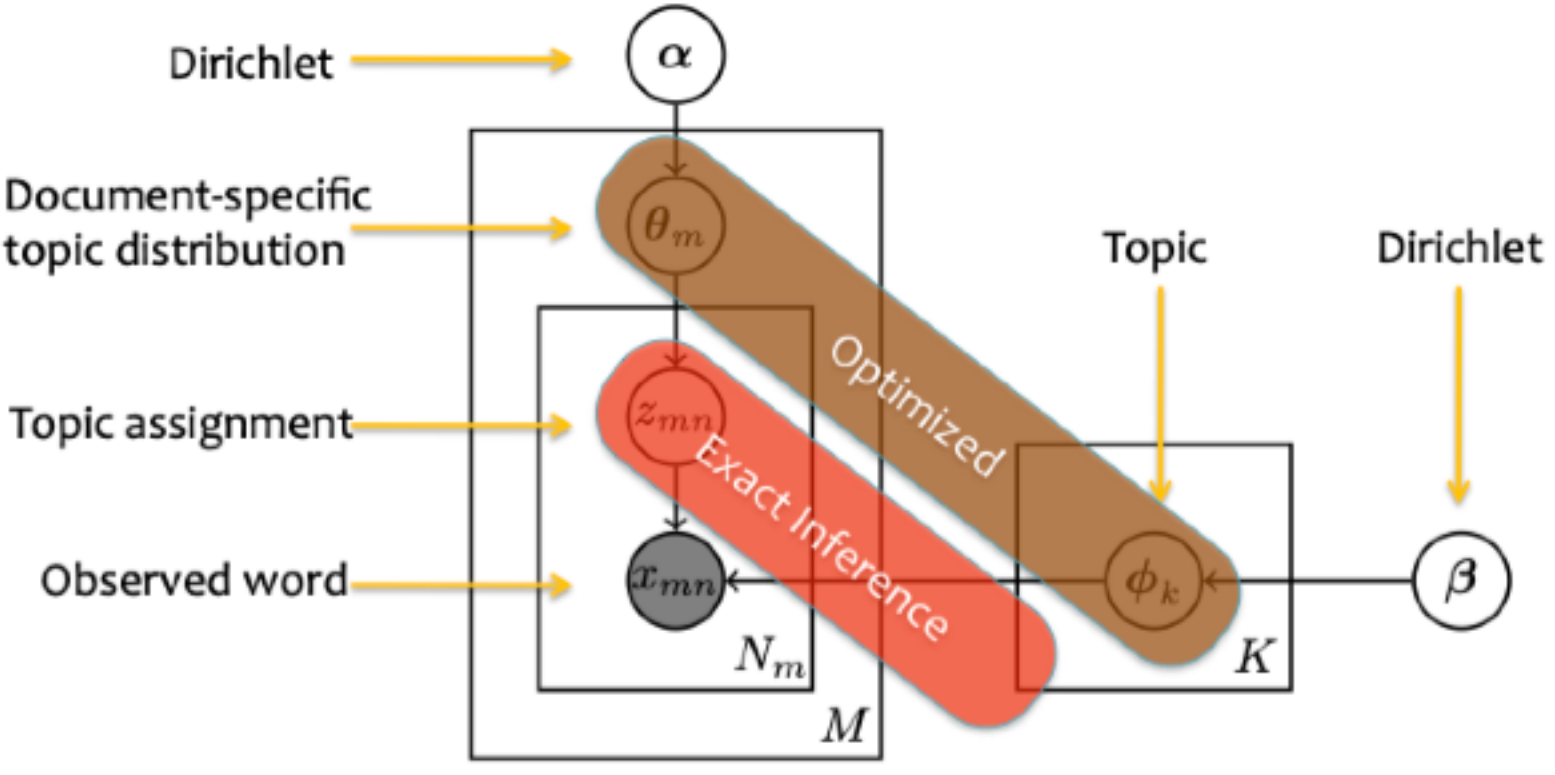
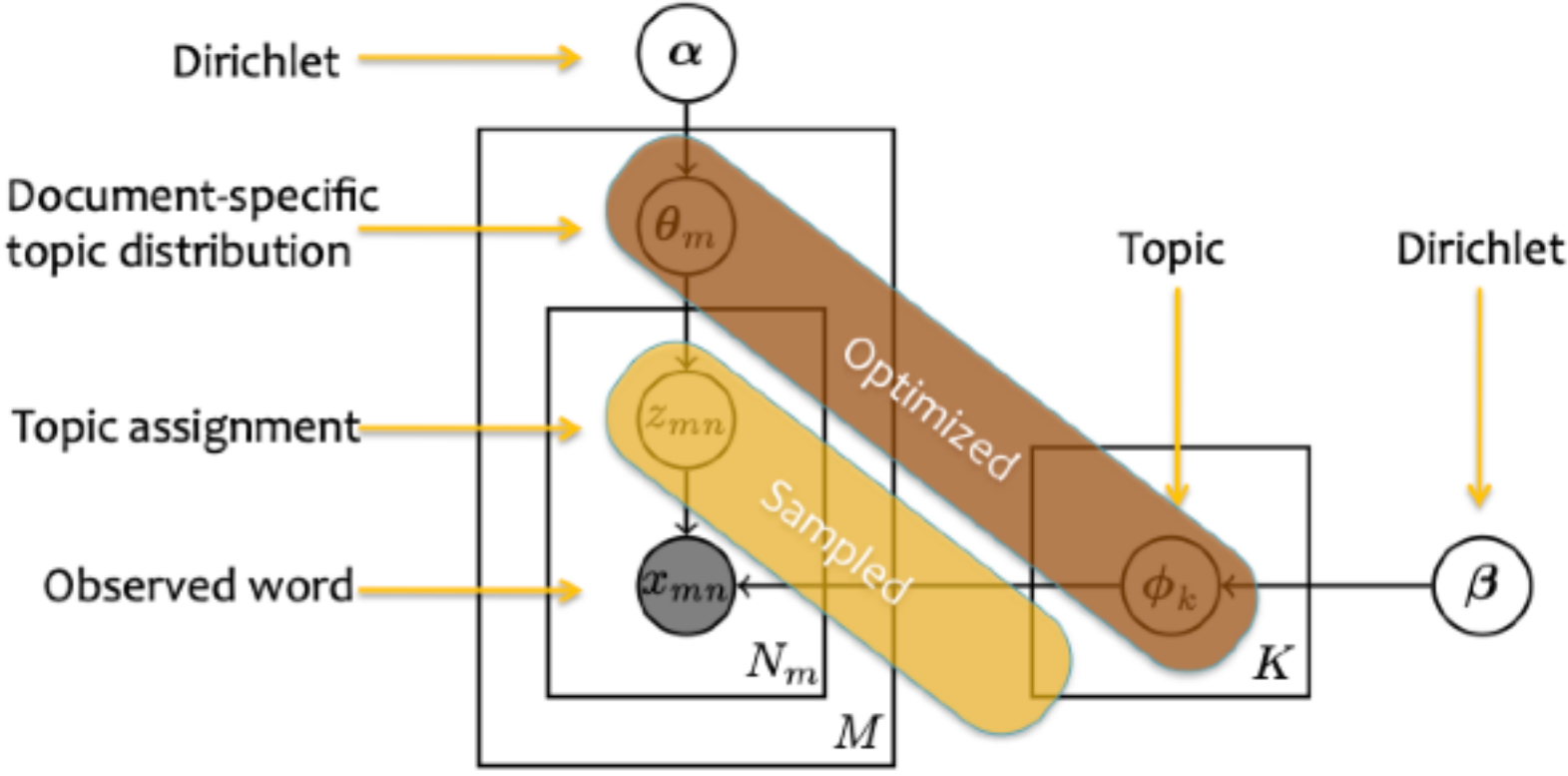
# LDA parameter estimation

19


Document-specific topic distribution
Topic assignment
Observed word
Topic
$\theta_m$
$z_{mn}$
$x_{mn}$
$\phi_k$
Optimized
Exact Inference
$N_m$
$M$
$K$


Dirichlet
$\alpha$
Document-specific topic distribution
$\theta_m$
Topic assignment
$z_{mn}$
Observed word
$x_{mn}$
$N_m$
$M$
Optimized
Exact Inference
Topic
$\phi_k$
$K$
Dirichlet
$\beta$


Dirichlet
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Document-specific
topic distribution
$\theta_m$
Topic assignment
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Observed word
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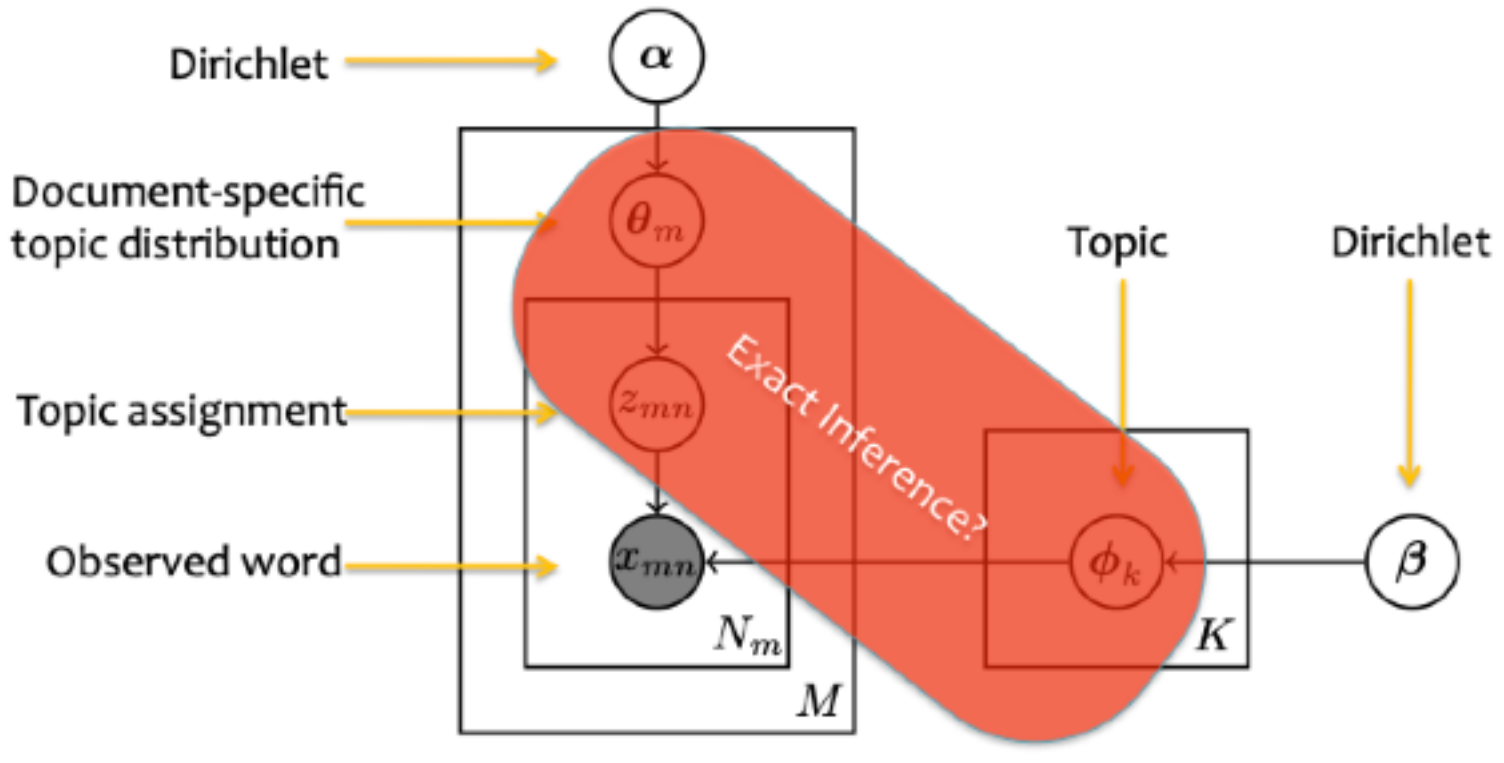
$M$
Optimized
Sampled
Topic
$\phi_k$
$K$
Dirichlet
$\beta$


Dirichlet
$\alpha$
Document-specific topic distribution
$\theta_m$
Topic assignment
$z_{mn}$
Observed word
$x_{mn}$
$N_m$
$M$
Exact Inference?
Topic
$\phi_k$
$K$
Dirichlet
$\beta$

MLE

# MAP

# Bayesian

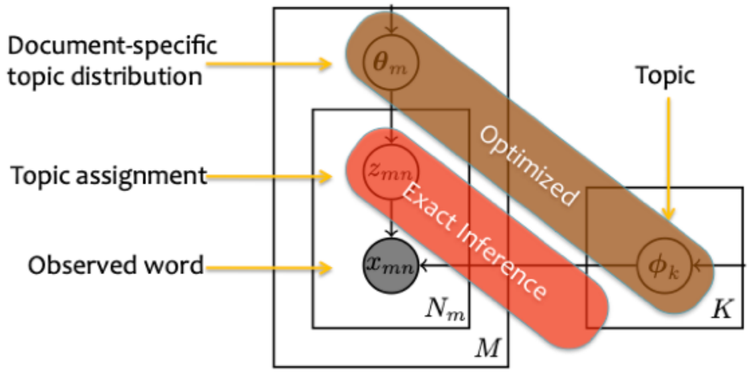
# Monte Carlo sampling

# Taken from Gormley, 2016

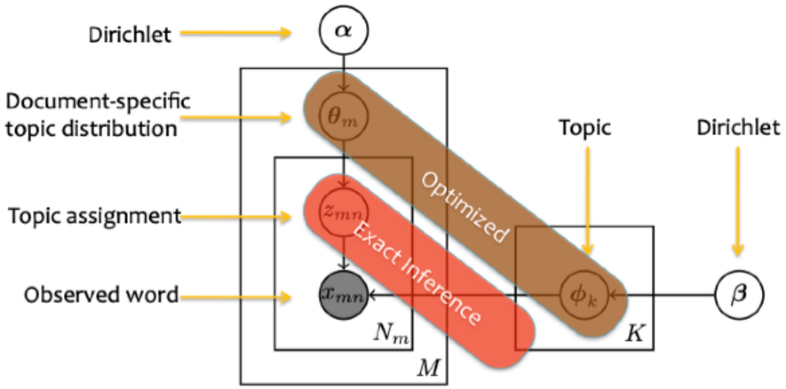
Intractable

# LDA parameter estimation

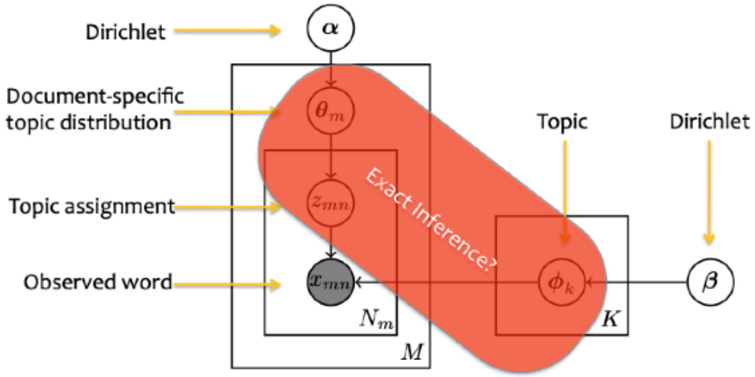
**MLE**




**MAP**

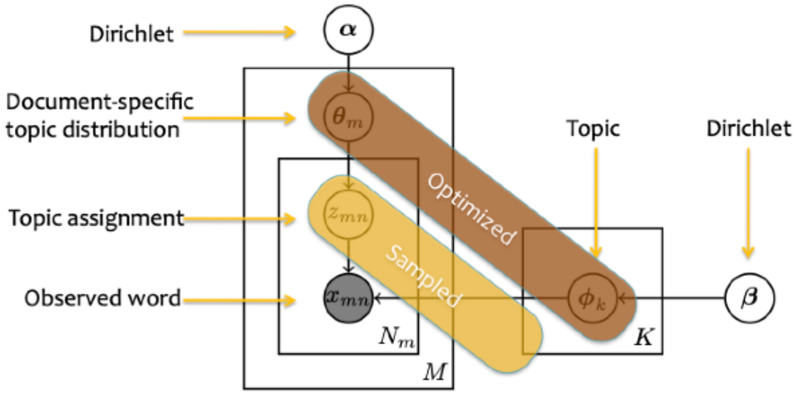



**Bayesian**




**Intractable**

**Monte Carlo sampling**




Taken from Gormley, 2016

Georgetown University

# Lab 04: Extracting topics from research articles