# Graphical Models in Tikz

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TikZ examples for graphical models (Bayesian networks) and directed factor graphs [**?**].

Table 1: Node types

| Type | Syntax | Output |
|---|---|---|
| Latent variable | `\node[latent]` |   |
| Observed variable | `\node[obs]` |   |
| Deterministic | `\node[det]` |   |
| Constant | `\node[const]` | $a$ |
| Factor | `\node[factor]` |   |

Table 2: Edge types

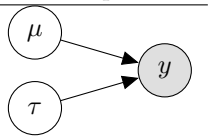
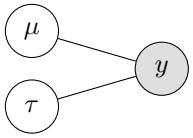
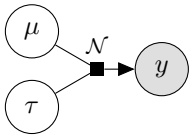
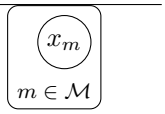
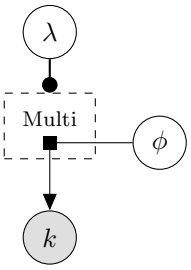
| Type | Syntax | Output |
|---|---|---|
| Directed edges | `\edge[opts]{inputs}{outputs}` |   |
| Undirected edges | `\edge[-,opts]{inputs}{outputs}` |   |
| Factor graph edges | `\factoredge[opts]{inputs}{via}{outputs}` |   |

Table 3: Utilities

| Type | Syntax | Output |
|---|---|---|
| Plate | `\plate` |  |
| Gate | |  |

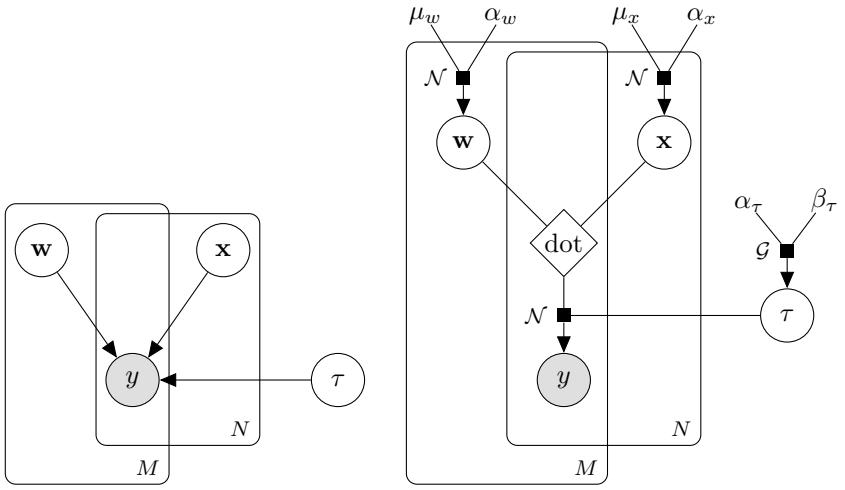



Figure 1: PCA model as a Bayesian network and a directed factor graph.

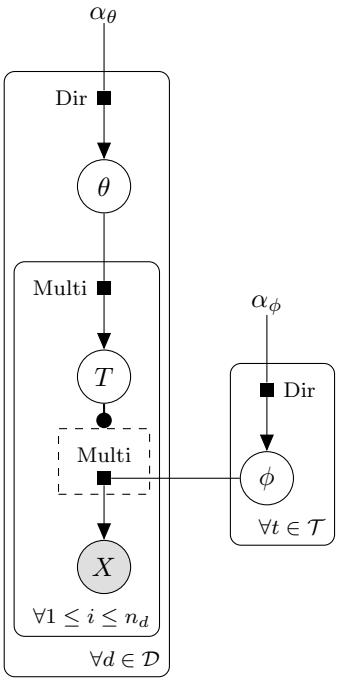



Figure 2: Latent Dirichlet allocation as directed factor graph.

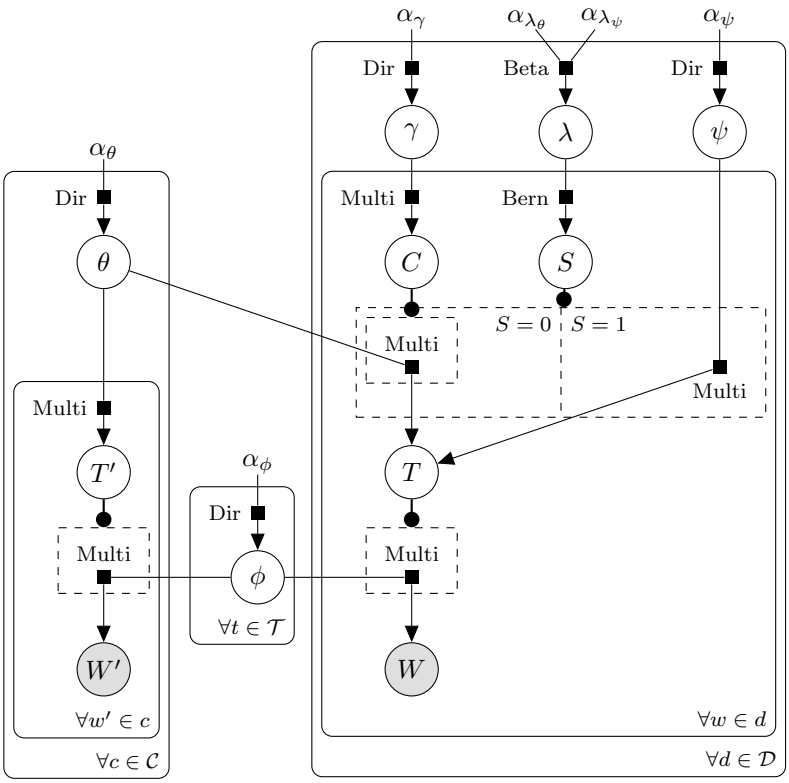



Figure 3: Citation influence model with own topics [**?**] as directed factor graph.

# References

[1] Laura Dietz, *Directed Factor Graph Notation for Generative Models*. Technical Report. 2010

[2] Laura Dietz, Steffen Bickel, Tobias Scheffer, *Unsupervised Prediction of Citation Influences*. In: Proceedings of International Conference on Machine Learning. 2007