

Probabilistic
Graphical
Models

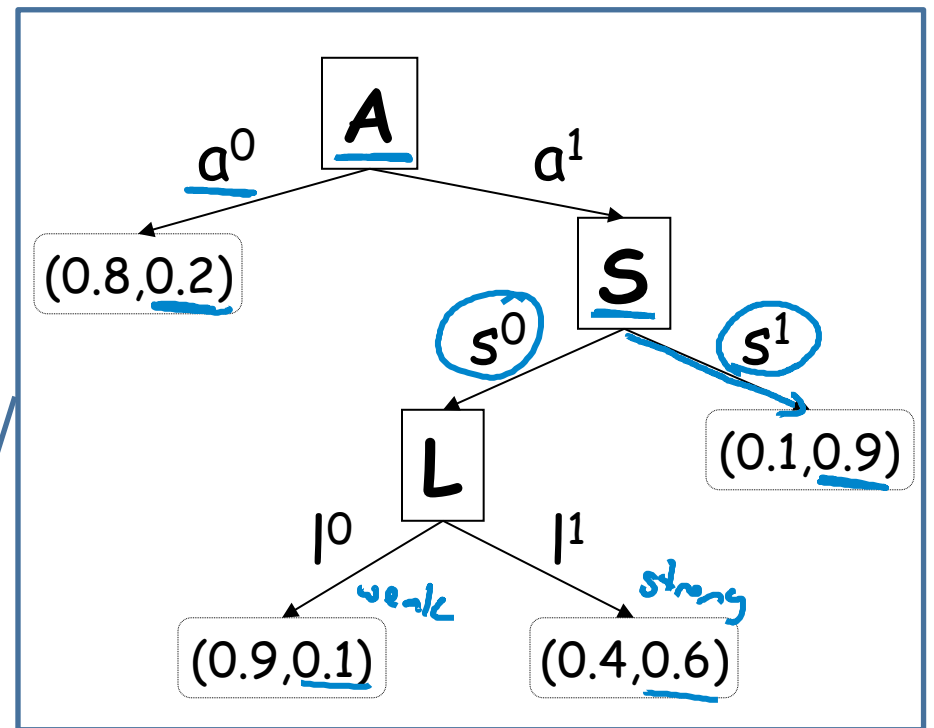
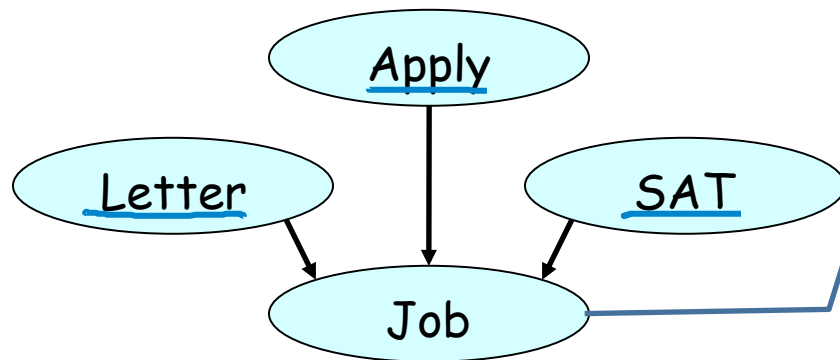


Representation

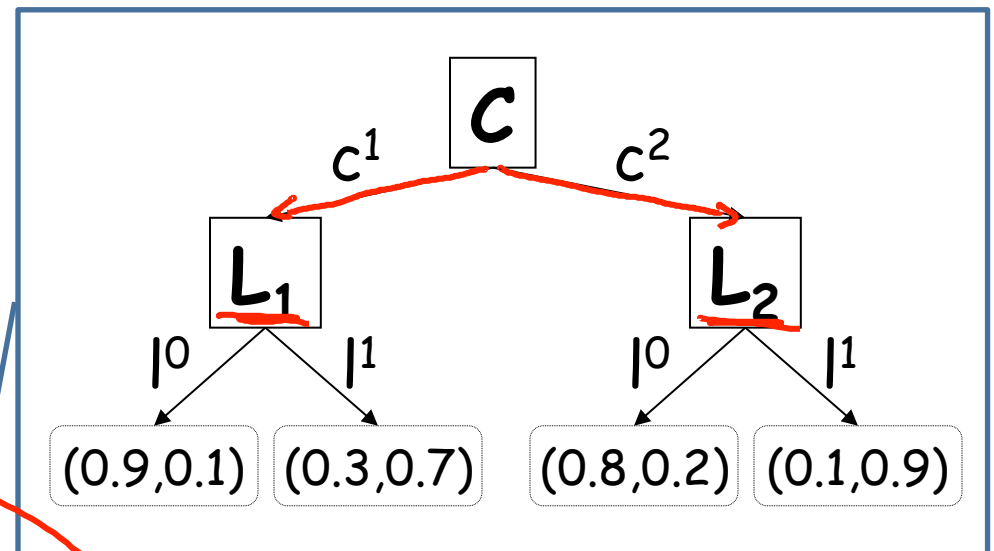
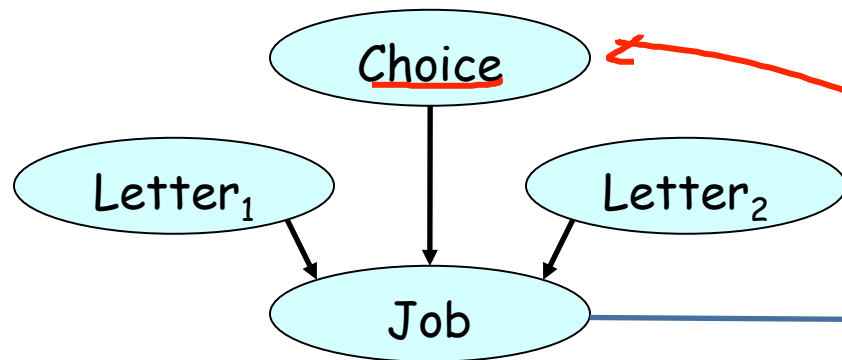
Local Structure

Tree
Structured
CPDs

Tree CPD



Tree CPD

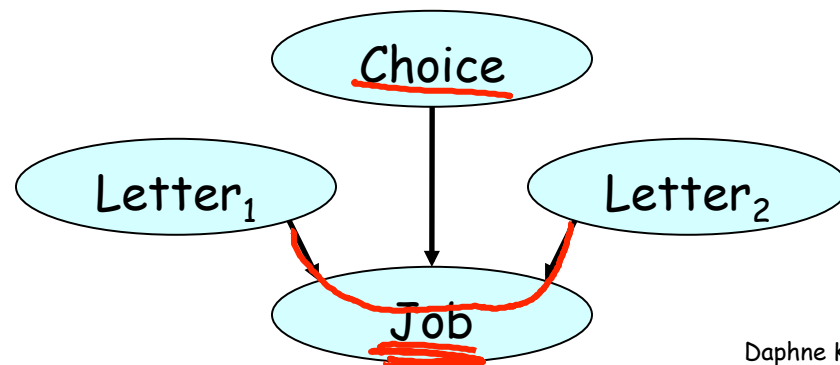
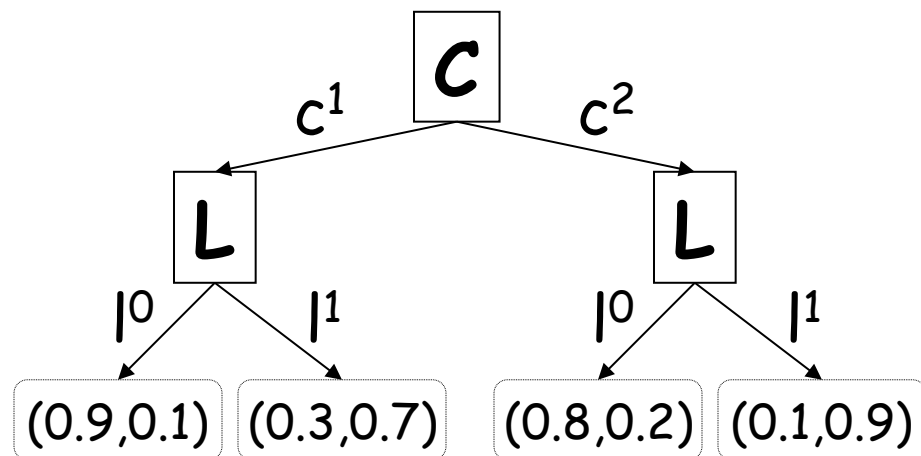


multiple levels

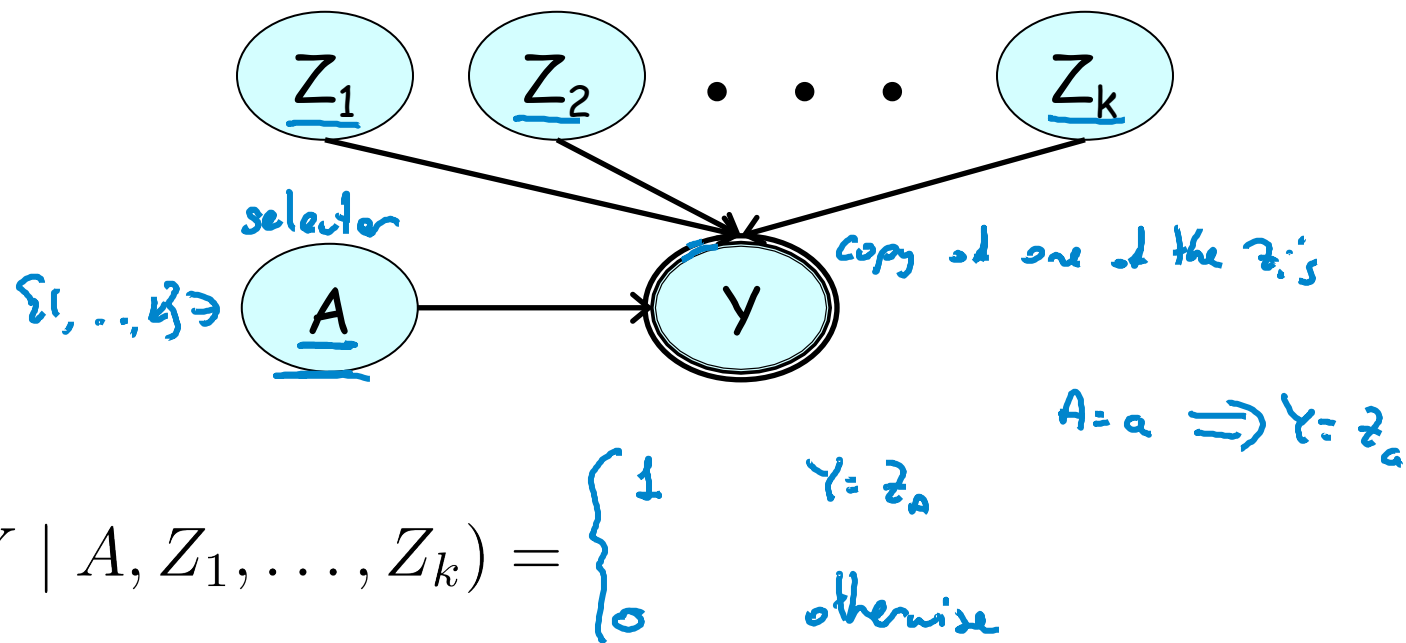
$$(L_1 \perp L_2 \mid J, C)$$

$$(L_1 \perp_c L_2 \mid J, c_1)$$

$$(L_1 \perp_c L_2 \mid J, c_2)$$

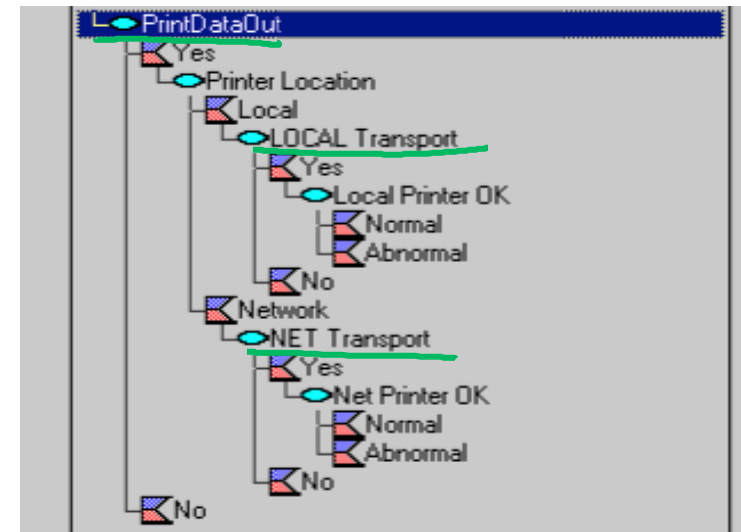
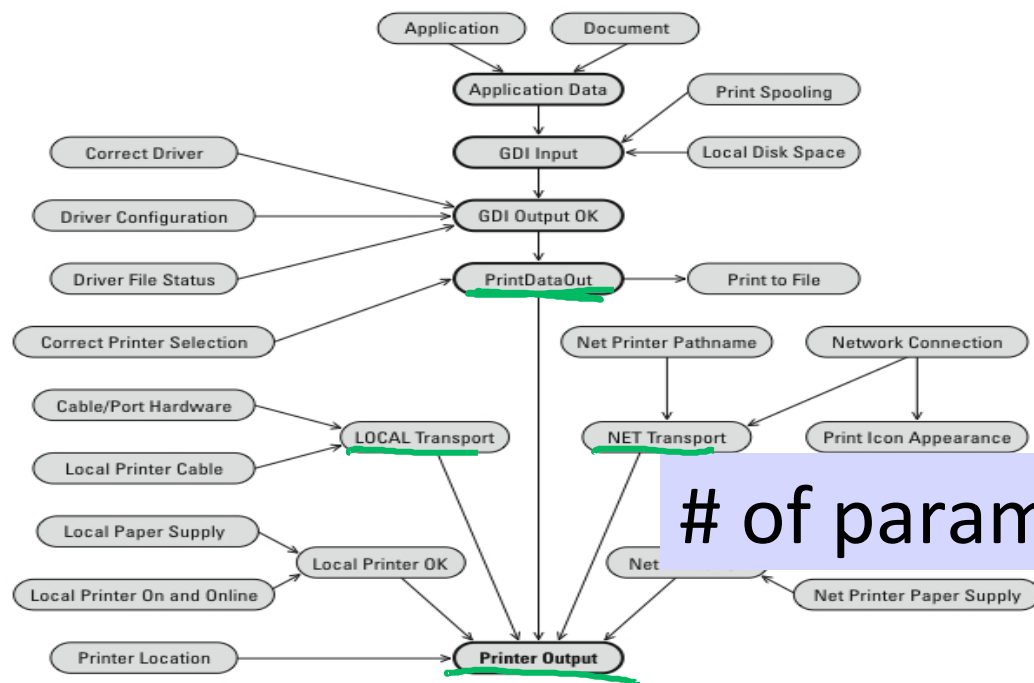


Multiplexer CPD



Thanks to: Eric Horvitz, Microsoft Research

Microsoft Troubleshooters



of parameters: 145 to 55

Summary

- Compact CPD representation that captures context-specific dependencies
- Relevant in multiple applications:
 - Hardware configuration variables
 - Medical settings
 - Dependence on agent's action
 - Perceptual ambiguity