

Learning Bayesian networks

	Complete data	Missing data	Hidden variables
Known structure	Closed form solution	<ul style="list-style-type: none"> Iterated optimization to local maximum Inference on network multiple times 	<ul style="list-style-type: none"> Symmetrical solutions Infinite number of solutions
Unknown structure, known variables	<ul style="list-style-type: none"> Combinatorial optimization over structures Score has closed form 	<ul style="list-style-type: none"> Inference over multiple different network structures No closed form for score 	
Unknown variables	N/A	N/A	<ul style="list-style-type: none"> Infinite number of possible solutions

Learning Markov networks

	Complete data	Missing data	Hidden variables
Known structure	<ul style="list-style-type: none"> Convex optimization problem solved optimally via numerical optimization Inference on network multiple times 	<ul style="list-style-type: none"> Non-convex problem Iterated optimization to local maximum Inference on network multiple times 	<ul style="list-style-type: none"> Symmetrical solutions Infinite number of solutions
Unknown structure, known variables	<ul style="list-style-type: none"> Combinatorial and numerical formulations Can be solved via convex optimization Inference over multiple different network structures 		
Unknown variables	N/A	N/A	<ul style="list-style-type: none"> Infinite number of possible solutions