

Issues with modelling decisions in Bayesian networks

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Overview

- Crowley's Example
- Constraint Node
- Shielding
- Alternative Bayesian Network
- Other Dependencies
- Decision Network
- Recommendations

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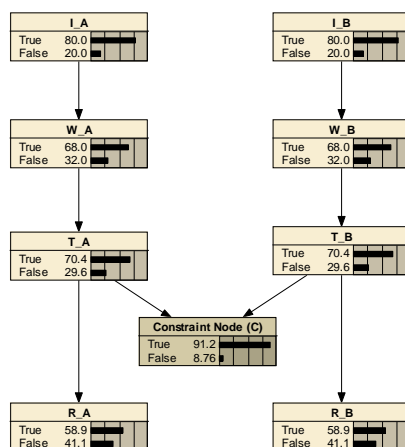
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Crowley's Example

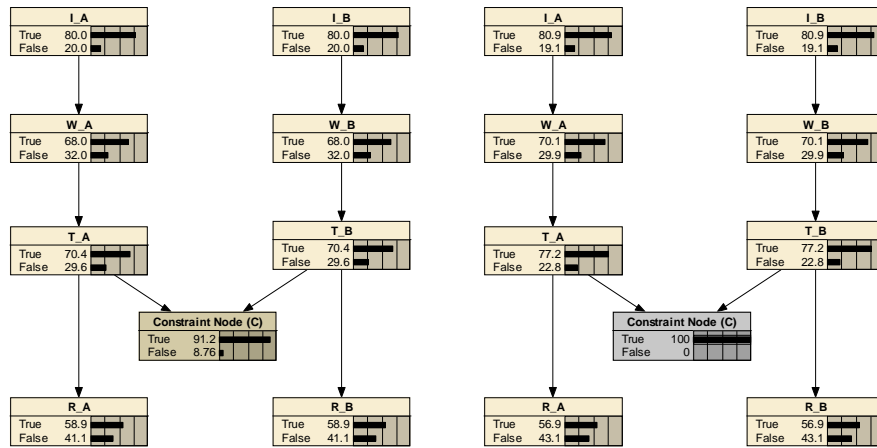
- Two lecturers are independently interested in teaching a subject.
- Whether they want to teach depends only on their interest.
- Whether they teach depends only on their interest.
- Whether they meet their research goals depend only on the whether they teach.
- At least one of them teaches the subject.

Constraint Node

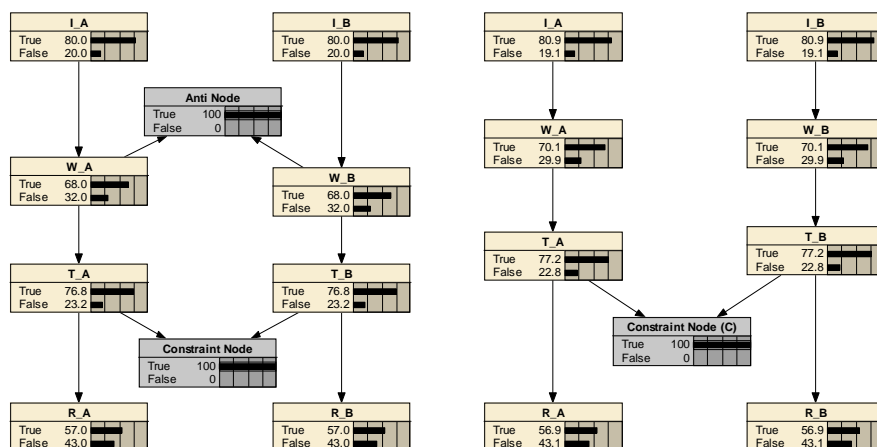


T_A	T_B	C
True	True	True
True	False	True
False	True	True
False	False	True

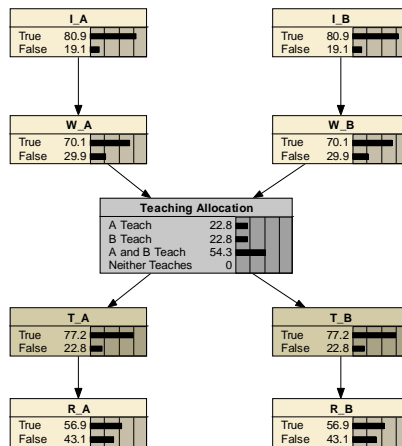
Constraint Node



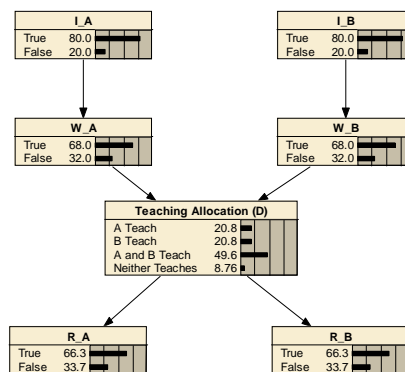
Anti-Node



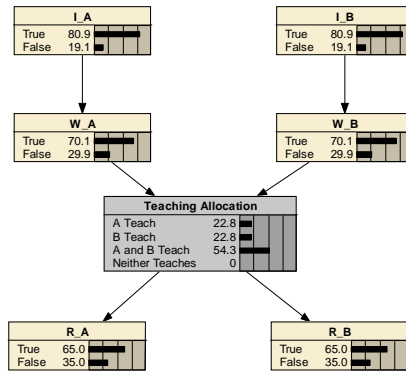
Alternative Bayesian Network



Modelling Other Dependencies

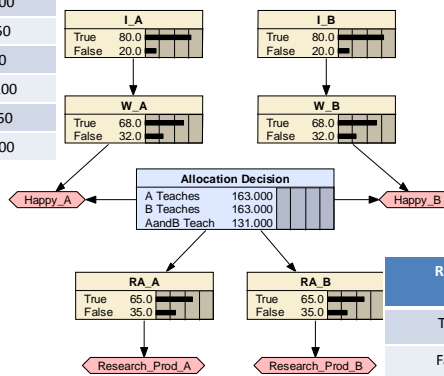


Negative Evidence

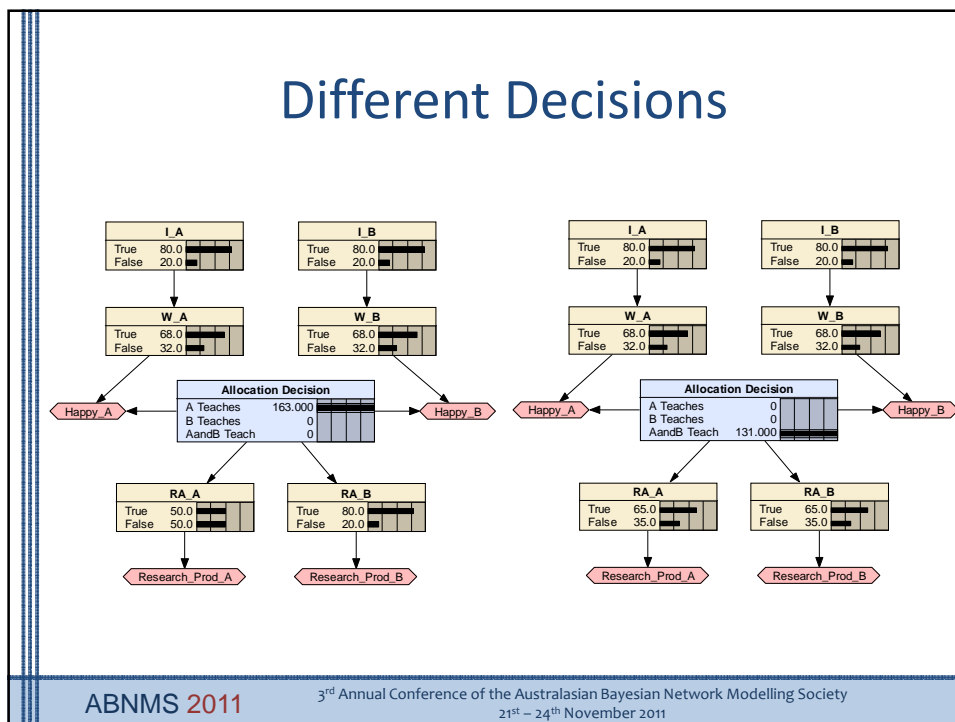
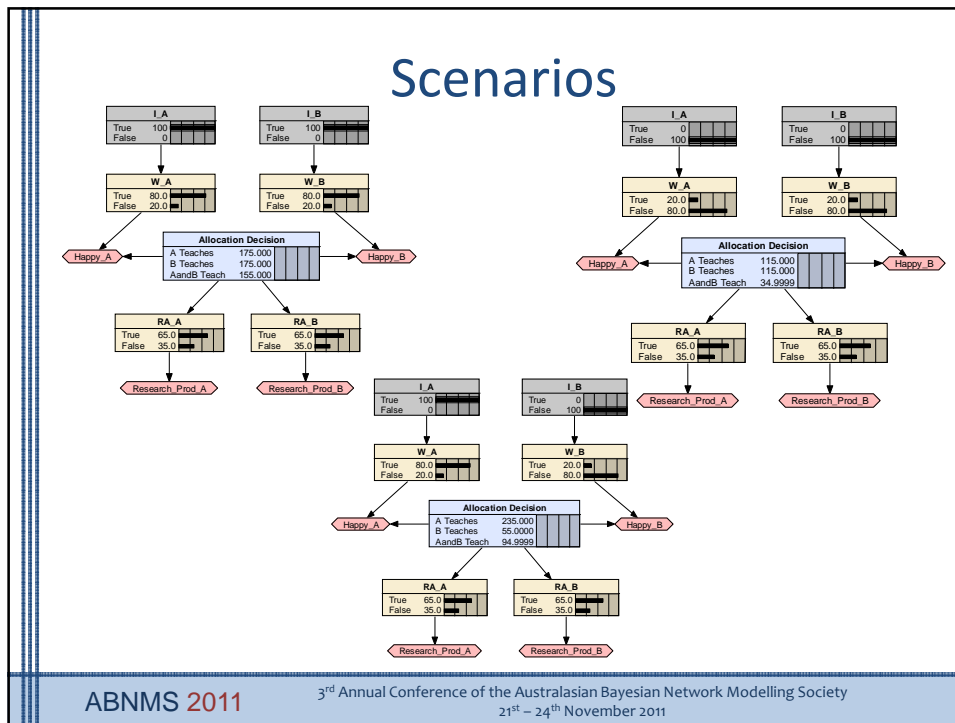


A Decision Network for Teaching Allocation

W_A	Allocate	Happy_A
True	A Teaches	100
True	A&B Teaches	50
True	B Teaches	0
False	A Teaches	-100
False	A&B Teaches	-50
False	B Teaches	100



RA_B	Research_Prod_B
True	100
False	-50



Recommendations

- Don't just add nodes and arcs to “fix” apparent problems.
- Check the modelling choices embedded in the model?
- If you are modelling a decision making process, then use a Bayesian network.
- If you want a network to support decision making, then use a Decision network.