

Graphical Models for Decision Making

Lesson 5, week 14, class 27

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Contens

① Models, Examples

② Models, Exercises

Outline of Contents

① Models, Examples

② Models, Exercises

Graphical Models for Decision Making

Tiny models

Overview about decision model examples

- Model script: `helicopter.r`
- Model script: `underground.r`
- Model script: `server.r`
- Model script: `feb09/10.r`

Graphical Models for Decision Making

IctNeo

Gómez, M., C. Bielza, J. A. Fernandez del Pozo, and S. Ríos-Insua, "A Graphical Decision-Theoretic Model for Neonatal Jaundice", Medical Decision Making, vol. 27, no. 3, pp. 250-265, 2007

Talk IctNeo

- dss-seminar-2014.pdf
- Model script: ictneo2HGM.r
- Set the model on GeNie:
 - `source("ictneo2HGM.r");`
 - `dump.netG(ictneo2HGM,"ictneo2HGM") → network-ictneo2HGM.xdls` (GeNie)

Graphical Models for Decision Making

NHL

Bielza, C., J. A. Fernandez del Pozo, and P. Lucas, "Explaining Clinical Decisions by Extracting Regularity Patterns", Decision Support Systems, vol. 44, pp. 397-408

Talk NHL

- clusterkbm2lcpts.pdf
- talk-kbm2l-cpt.pdf
- Model script: nhlv1.r
- Set the model on GeNie:
 - `source("nhlv1.r");`
 - `dump.netG(nhlv1,"nhlv1") → network-nhlv1.xdls (GeNie)`

Outline of Contents

1 Models, Examples

2 Models, Exercises

Graphical Models for Decision Making

Practice on Bayesian Networks

Learnig and simulation Bayesian Networks

Use some of the following datasets, do the analysis and write a report in pdf format to upload in moodle

- Data: dataset-Z6a.csv, dataset-Z6b.csv; for each dataset:
- Define 6 variables $Z_i, i = 1 \dots 6$, estimate the probability distribution
- Write using IdR format a BN with marginal nodes and evaluate it.
- Learn a BN using IdR lbn() function, try it with diferent parameters
- Learn a BN using GeNie, try it with diferent parameters and algorithms
- Evaluate a BN using the exact algorithm and the snb() function
- Export each model to GeNie
- Analize and evaluate each model using GeNie and show instances of evidence

Check relevance of probabilistic influence

Graphical Models for Decision Making

Practice on Bayesian Networks

Learnig and simulation Bayesian Networks

Use some of the following datasets, do the analysis and write a report in pdf format to upload in moodle

- Data: dataset-P20a.csv, dataset-P24b.csv, dataset-P14a.csv, dataset-P14a.csv; for each dataset:
- Define 20/24 variables $P_i, i = 1 \dots 20 / P_i, i = 1 \dots 24$,
- Learn a BN for each dataset using IdR format
- Evaluate each BN using the exact algorithm and the `snb()` function
- Export each model to GeNie
- Learn a BN using GeNie, try it with diferent parameters and algorithms
- Analize and evaluate each model using GeNie and show instances of evidence

Check relevance of probabilistic influence

Graphical Models for Decision Making

Practice on Influence Diagrams

Use some of the following models, do the analysis and write a report in pdf format to upload in moodle

Decision Models Definition and Evaluation

- Models: feb2009.r, feb2010.r, itneo2HGM.r, nhl1.r, underground.r, server.h, helicopter.r
- Evaluate and show the optimal decision alternative tables
- Export to GeNie and evaluate the models
- Show some instances of evidence