



INTRODUCTION TO BAYESIAN NETWORKS

A professional short course by Innovative Decisions International, LLC. (an ITA company)

Three offerings in 2021: 23-25 Feb, 25-27 May, 19-21 Oct

Bayesian networks are probabilistic models that enable a user to understand an uncertain situation, explore what-ifs, and consider collection of new data. They synthesize knowledge from experts and case data.

- ❖ Learn to elicit Bayesian network structures and probabilities from experts
- ❖ Build Bayesian networks from simple to real-world applications
- ❖ Dennis, Dave, and Joe teach from decades of experience applying Bayesian networks in national security, government, and industry
- ❖ Learn about building geospatial models in GeoNetica and combining Netica with discrete event simulation
- ❖ Learn about advances in Bayesian network tools and applications
- ❖ Practice learning Bayesian network structures and probabilities from data
- ❖ Rapid fire model building exercises to develop formulation expertise

Course emphasizes learning by doing. **Students need their laptops!** Also, please think about a problem you can work on during student workshop time. We will supply a free student version of the Netica software. This course contains several model-building exercises to allow students to develop formulation ability.

Instructors:



Dennis Buede



Dave Brown



Joe Tatman



Michael Resig



Jared Beekman

Courses in 2021 will be virtual, some participants can come to our office, pandemic conditions permitting.

For more information contact: dmbuede@InnovativeDecisions.com

Day 1 –

- ❖ Introduction
- ❖ Building a simple Bayesian network (BN) – drug testing
- ❖ Just enough probability
- ❖ A complete diagnostic BN – Liver diagnosis case study
- ❖ Elicitation of BN structure and probabilities
- ❖ Student Project Definition
- ❖ BN Process Models

Day 2 –

- ❖ Troubleshooting systems – Industrial system example
- ❖ D-Separation and sensitivity to findings
- ❖ Student Workshop (opportunity to work on your own BN problem)
- ❖ Learning probabilities for a BN from data
- ❖ Combining expert knowledge and data
- ❖ Learning structure for a BN from data
- ❖ Learning a BN with continuous variables

Day 3 –

- ❖ Netica API and programming
- ❖ Student Workshop
- ❖ Introduction to GeoNetica™
- ❖ Student Workshop

Advanced topics available on a case-by-case basis

- ❖ Decision making in Netica using influence diagrams
- ❖ Using the Netica library in the ExtendSim discrete event simulation
- ❖ Explore BN structure building using R

Class runs 8:30 to 4:30 each day. Topics subject to change.

Please visit <https://www.innovatedecisions.com/idi-bayesian-network-course-in-netica/> for latest info & list of nearby lodging options.

Cost \$1900 includes all handouts, drinks, and light snacks throughout the day.

A discount of \$200 for early registration is available (if registered three weeks prior to the start of the course). We also offer a discount for multiple persons from the same organization.

Register Now, Pay Later! Due to current COVID19 social distancing guidelines, we will not be processing any course payments at this time, but we encourage you to register today to reserve your seat! We will contact you for payment the week prior to training!



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