

INTRODUCTION TO BAYESIAN NETWORKS

A professional short course by Innovative Decisions, Inc. | **November 13-15, 2018**

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

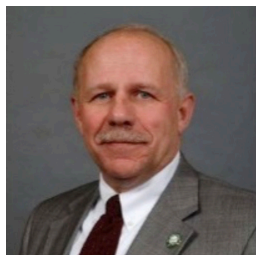
- Learn to elicit Bayesian network structures and probabilities from experts
- Build Bayesian networks from simple to real-world applications
- Dennis, Dave, Joe, and Bob teach from decades of experience applying Bayesian networks in national security, government and industry
- Learn about building geospatial 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

LOCATION IDI Offices 8230 Old Courthouse Road Suite 460, Vienna, VA 22182

For more information contact: dmbuede@innovativedecisions.com



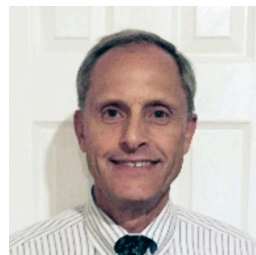
Dennis Beude



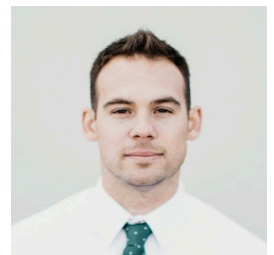
Dave Brown



Bob Powers



Joe Tatman



Jared Beekman

- 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
 - Causal Models

- Day 2**
- Troubleshooting systems - Netica car diagnosis example
 - Troubleshooting systems - Industrial system example
 - Learning probabilities for a BN from data
 - Student Workshop (opportunity to work on your own BN problem)
 - D-Separation and sensitivity to findings
 - Combining expert knowledge and data
 - BN Building Practicum
 - Learning structure for a BN from data

- Day 3**
- Netica API
 - Student Workshop
 - Learning a BN with continuous variables
 - Introduction to GeoNetica™
 - Student Workshop
 - Dynamic Bayesian networks / Incorporation of evidence over time

Advanced topics available on a case-by-case basis

- Continuous variables - Model aggregation example & discretization
- Named probability distributions in Netica
- Inference and basics of the propagation algorithm behind BNs
- Bayesian network formulation practicum – build lots of BNs
- Decision making in Netica using influence diagrams
- Using the Netica library in the ExtendSim discrete event simulation

Class runs 8:00 to 4:00 each day. Topics subject to change.

Please visit for www.innovatedecisions.com/bn-course for latest info & list of nearby lodging options.

COST \$1,950 includes all handouts and drinks and light snacks throughout the day.

A discount of \$200 for early registration is available (if registered by July 10). We also offer a discount for multiple persons from the same organization.

The course is very hands-on. **Please bring a laptop.** Also, please think about a problem you can work on during Student Workshop time.



Innovative Decisions, Inc.

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or contact dmbuede@innovatedecisions.com