

Roger Woodard, Program Director

BIG DATA BIGGER OPPORTUNITIES



Webcast Series



DATA SCIENCE



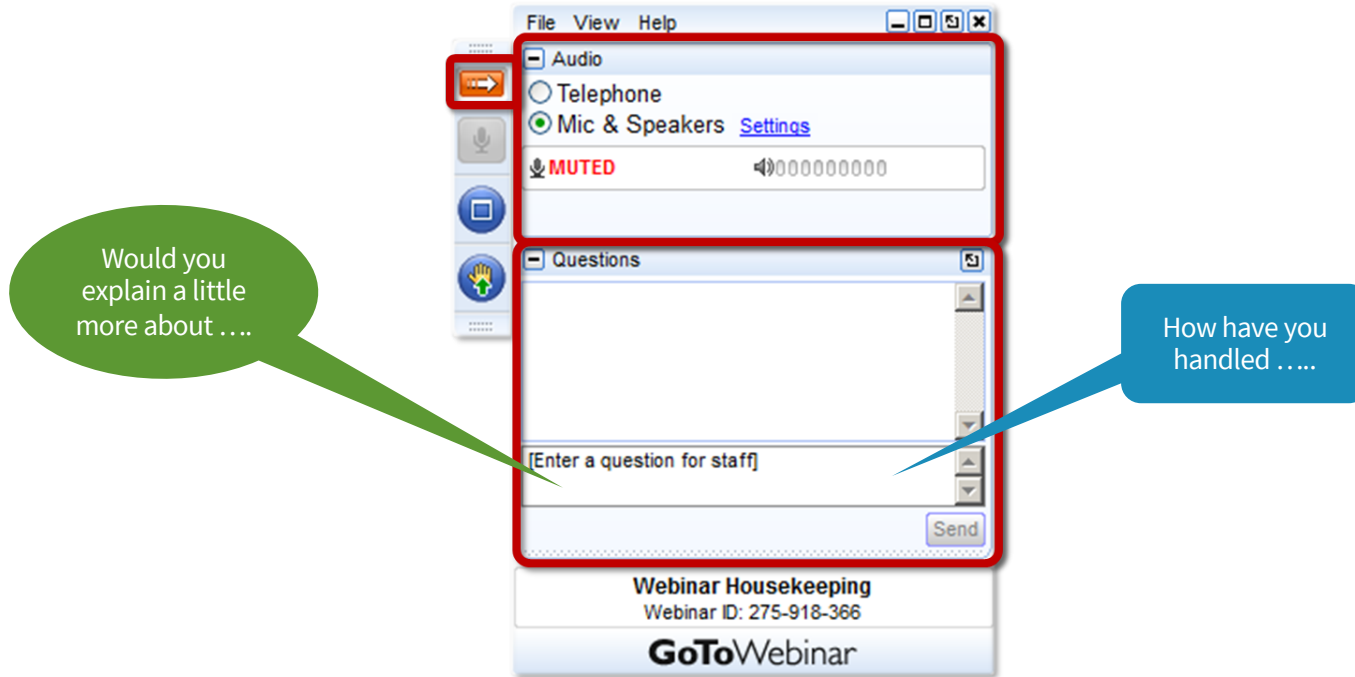
About MoreSteam

Enterprise continuous improvement from training to project completion

588,000+



GoToWebinar Attendee Panel



Roger Woodard

- University of Notre Dame
 - Applied and Computational Mathematics and Statistics (ACMS)
- NC State
 - Department of Statistics
- ...
- Quality process auditor



Today

- A little about
 - AI
 - Machine Learning
 - Deep Learning
- A challenge

Answer a question

- Please enter your answer in the question window.

Question for you

- What is Data Science?



What is Data Science?

- Relatively new term
- Answer questions from data
 - “deal with the deluge of data”
- Combination of
 - Computer science
 - Statistics/modeling
 - Subject knowledge

Some Key Skills

- Data manipulation
 - Bring together data sources
 - Clean and refine data
 - Basic programming/wrangling
 - Handling large data

Some Key Skills

- Modern modeling methods
 - Traditional statistics and regression, Lasso etc.
 - Artificial Intelligence, machine learning, natural language processing

What is AI?

- Replicate things that would need a human
 - Image recognition
 - Choosing a route
 - Having a conversation
 - Driving a car

What is AI?

- Thinking machines
 - Mimic cognitive function
 - Make decision, react to stimuli

Machine Learning

- A subset of AI
 - Algorithms that learn from data
 - Based on examples => Training data
 - Don't need specific instructions

Machine Learning Algorithms

- Decision trees
- Random Forests
- K nearest neighbors
- Naïve Bayes
- Neural Networks

Neural Networks

- Intended to mimic the function of the brain
 - Weight a set of inputs
 - Produce an output

A Question for you

Question for you

Imagine you are a stone age person.

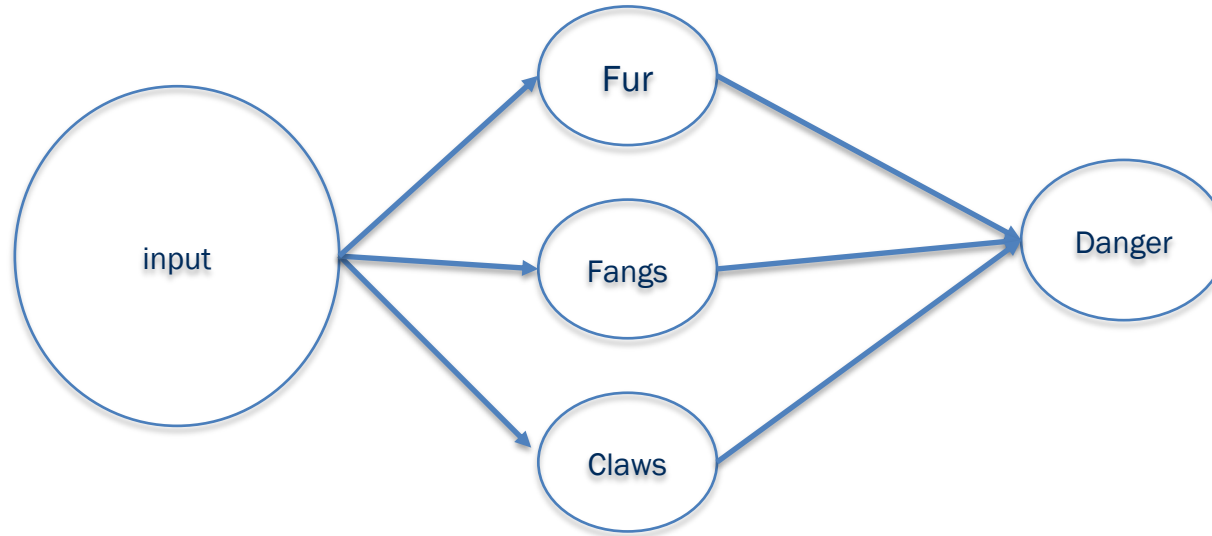
What characteristics of animals around you would indicate they are dangerous?

Neural Networks

- Danger?
 - Fangs
 - Fur
 - Claws



Neural Networks

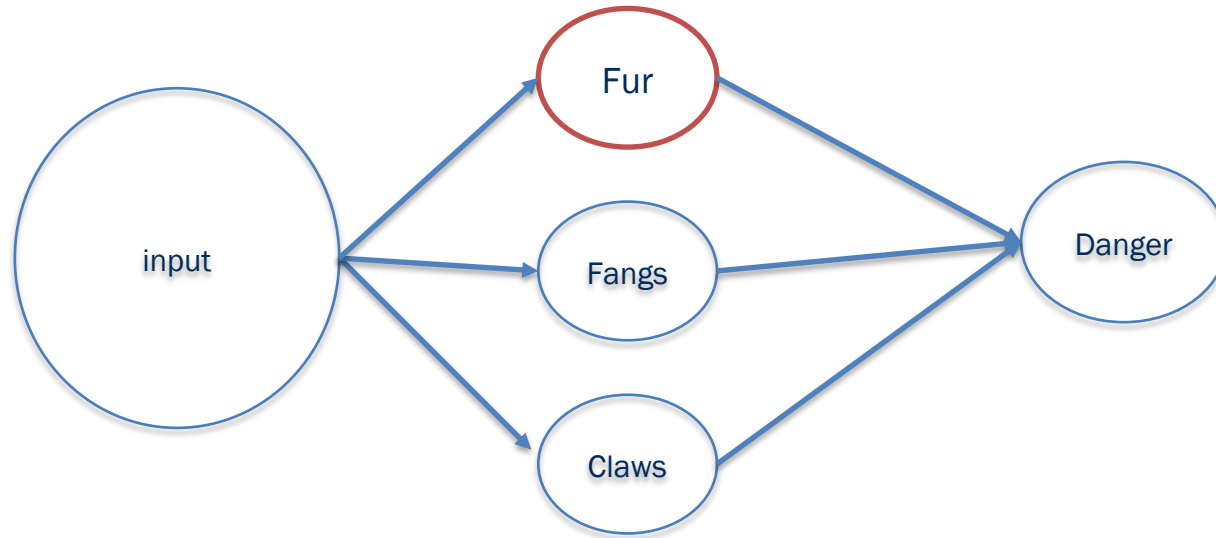


Enough of the danger stimuli and we run





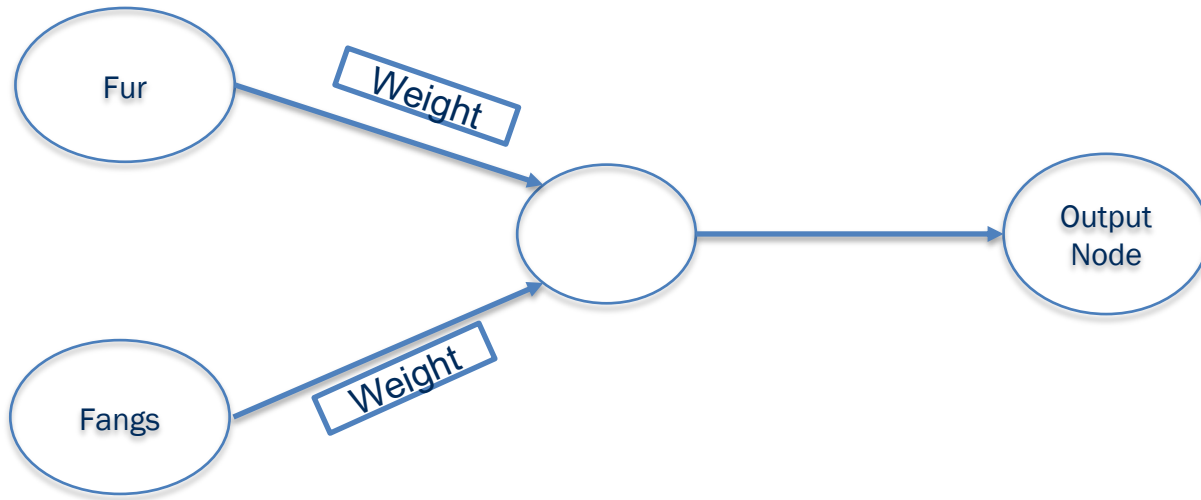
Neural Networks



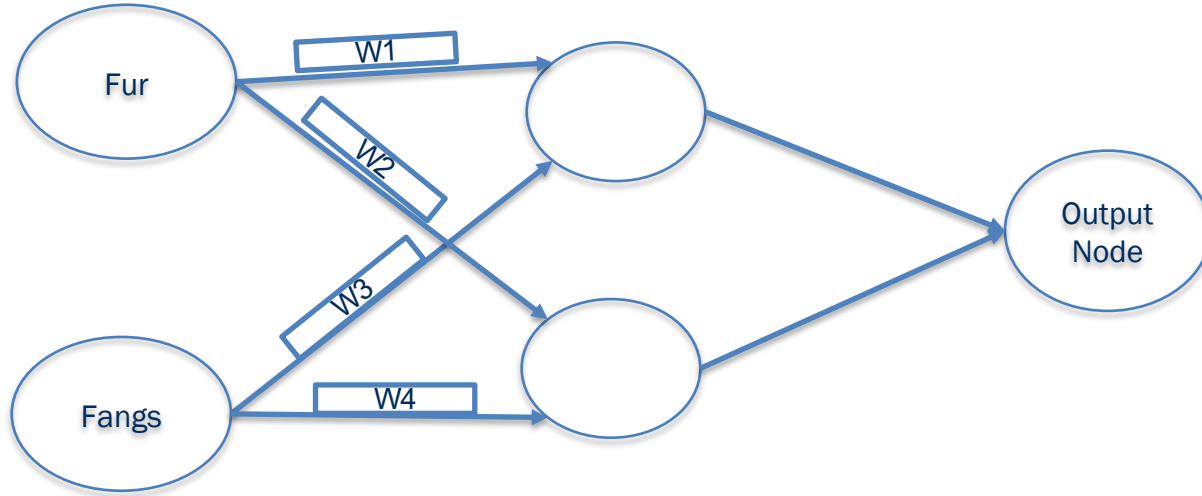
Artificial Neural Networks

- A series of “nodes”
 - Weights
- Output of the nodes pass on to next node

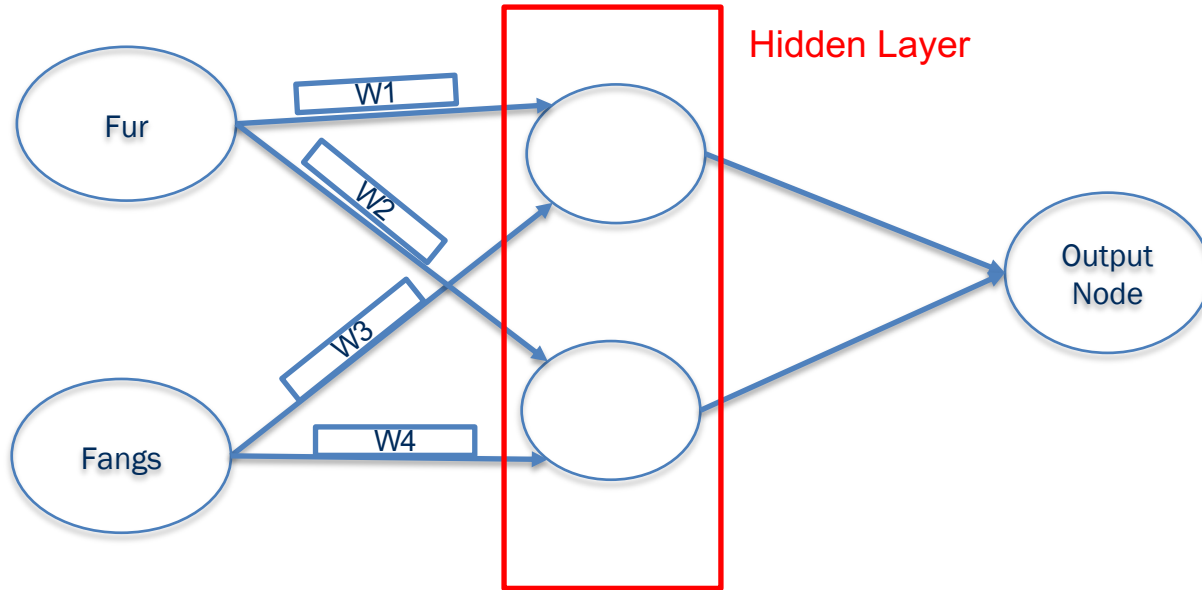
Neural Networks



Neural Networks



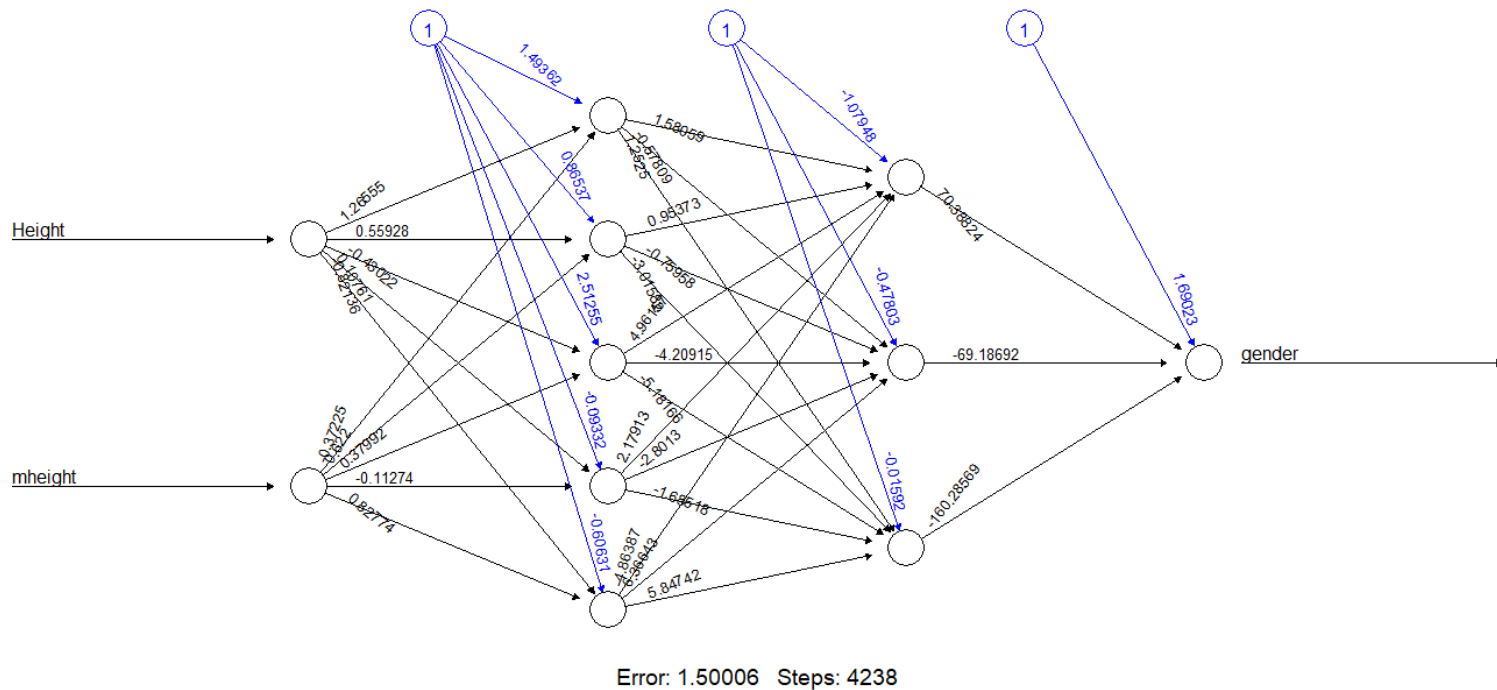
Neural Networks



Deep Learning

- Artificial neural networks
 - Multiple hidden layers
 - Many hidden nodes
 - Many weights

Neural Networks



“black box”

- It is difficult to say what type of impact a particular value of a variable has on the prediction

Where are they used?

- AI, NN, ML
 - Finance, marketing, supply chain, criminal justice, management, ... everywhere...

Challenge

- Ethics of Data Science
- Black box algorithms
 - What if they are biased?
 - Potential to impact people

Ethical Challenges

- If the training data is biased
 - The predictions will be biased
 - Which transactions will be flagged?
 - Who will be referred for secondary screening?

Ethical Challenges

- How we use results?
 - Combine data from multiple sources
 - Right of privacy?
 - Right of transparency?

How do I learn more?

- More about Data Science, Machine Learning, AI etc.
 - Executive Certificate
 - Master's degree

Executive Certificate

- Introduction to Data Science
 - What is in the tool box
- 3.5 days in person
 - Introduce the basic structures
- 5 weeks of evening online sessions
 - Work with the content over time

Executive Certificate

- Designed for process professionals
 - Apply data science in process improvement
- Prerequisites
 - Probability and statistics
 - Linear regression

Executive Certificate

- Major topics in Data Science
 - Data wrangling
 - Visualization
 - Machine Learning
- Some basic programming
 - Tool for learning about topics

Master's Degree

- Designed for working professionals
 - Asynchronous content
 - Live evening sessions
- 21 months
- Small cohort sizes
- Personalize experience

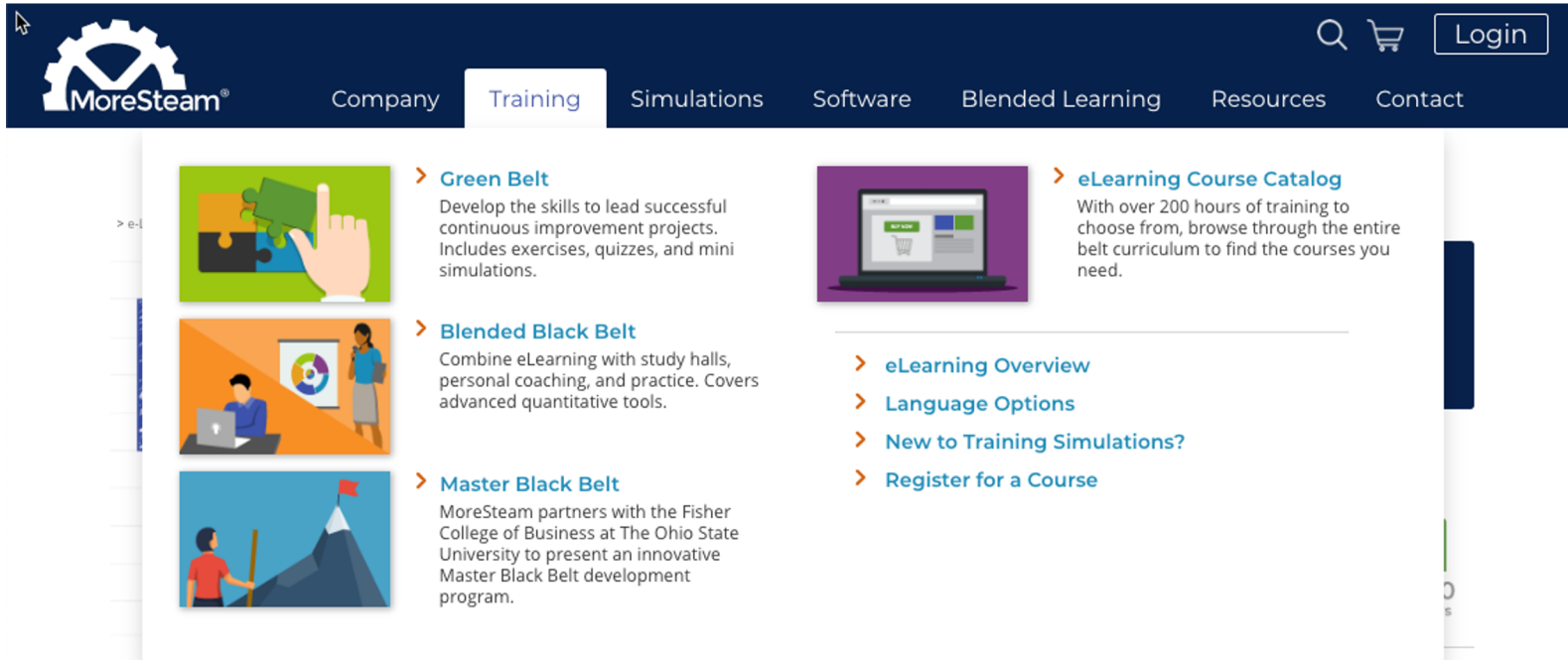


BIG DATA BIGGER OPPORTUNITIES



DATA SCIENCE

Additional Training at MoreSteam.com



The screenshot displays the MoreSteam.com website interface. At the top, a dark blue navigation bar contains the MoreSteam logo (a gear with a stylized 'M') on the left, and search, shopping cart, and login icons on the right. Below the logo, a horizontal menu lists: Company, Training (highlighted with a white background), Simulations, Software, Blended Learning, Resources, and Contact. The main content area features three training programs on the left, each with an icon and a description, and an eLearning Course Catalog on the right with a list of links.

MoreSteam® Company **Training** Simulations Software Blended Learning Resources Contact

Green Belt
Develop the skills to lead successful continuous improvement projects. Includes exercises, quizzes, and mini simulations.

Blended Black Belt
Combine eLearning with study halls, personal coaching, and practice. Covers advanced quantitative tools.

Master Black Belt
MoreSteam partners with the Fisher College of Business at The Ohio State University to present an innovative Master Black Belt development program.

eLearning Course Catalog
With over 200 hours of training to choose from, browse through the entire belt curriculum to find the courses you need.

- > eLearning Overview
- > Language Options
- > New to Training Simulations?
- > Register for a Course

Free Resources at MoreSteam.com

The screenshot displays the MoreSteam.com website interface. The top navigation bar is dark blue with the MoreSteam logo on the left and links for Company, Training, Simulations, Software, Blended Learning, Resources, and Contact on the right. The Resources section is highlighted. Below the navigation bar, the page is divided into two columns. The left column features three resource categories, each with an icon and a description: Knowledge Center (orange background, book and gear icon), Toolbox (blue background, toolbox icon), and Webcasts (purple background, person at computer icon). The right column features the MoreSteam Blog (green background, laptop icon) and a list of additional resources: Newsletter, Papers & Articles, EngineRoom Tutorials, and TRAcTion Tutorials. The titles of the Knowledge Center, MoreSteam Blog, and Toolbox sections are circled in yellow.

MoreSteam® Company Training Simulations Software Blended Learning **Resources** Contact

Knowledge Center
Browse the full collection of free resources on Lean Six Sigma and process improvement, including tutorials, webcasts, and white papers.

Toolbox
Learn about commonly used tools for measuring process performance, root cause analysis, process control, and more.

Webcasts
Watch recorded presentations hosted by industry-experts and quality practitioners.

MoreSteam Blog
Read the MoreSteam blog for articles on a wide-range of interesting topics and tools.

- > Newsletter
- > Papers & Articles
- > EngineRoom Tutorials
- > TRAcTion Tutorials

Question? Feedback? Idea?



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NEXT PROGRAM: April 30th with Rob Woods, Deputy Director of the State of Arizona Department of Revenue.

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