Applied AI & Machine Learning– Comprehensive Experience

Course Summary

Description

This comprehensive active course provides leaders and practitioners with both a strategic and tactical orientation to predictive analytics. Participants will build an analytic operation in stages to experience the natural messiness of predictive analytics. No other training in the market provides such an immersive, skill-reinforcing, and complete view of the practice – particularly with a real-world focus and vendor-neutral perspective.

If you are a business or public sector leader or practitioner looking to propel your organization’s analytic maturity and put predictive analytics to work for measurable gain, then this course is designed for you. You do not need to know how code or have stats experience to participate.

Traditionally, organizations use data retrospectively – to view what has already happened. Leading organizations use data strategically to anticipate behavior to maximize returns and minimize risk. The mining of data for predictive indicators creates invaluable information assets. Predictive analytics differs from traditional analytics because it produces models — models that capture and represent hidden patterns and interactions in the data.

The models that result from such a proactive approach address both why things happened and what is likely to happen next. A user can pose “what-if” questions to an analytic model that cannot be queried directly from a data store. Examples include:

- What is the expected lifetime value of every customer account?
- How can we better target the allocation of organizational resources?
- Which cases should be audited first for the highest propensity of fraud?
- How will production quality be affected if resources and controls change?

The organizations that transform their data into information assets and automate decision-making for measurable gains will realize substantial returns on their data science and big data investments.

This course provides a methodical, holistic, and strategic approach to predictive analytics. Most organizations jump directly into data and tools that tend to produce good models… and their projects fail. They fail because they have not anticipated how to integrate the project in the organization. Those who make the investment to fully assess their environment, situation, resources, and objectives across all team members will produce project results that are measurable, accountable, actionable, and impactful.

Unlike any other course on the market, the Comprehensive Experience course steps through the full build of an analytic operation within the realistic environment of a large organization. Leaders who take this course will interact more effectively with their teams at the tactical level, while analytic practitioners will complement their existing algorithmic background with a more strategic goal-driven focus.

In the end, the organization will be greatly strengthened with team members who operate within a common platform that makes predictive analytics purposeful and impactful. Those who complete this course will be capable of guiding their organization to build a thriving internal analytic practice with measurable and residual gains.

In the end, the organization will be greatly strengthened with team members who run from a common platform that insists on making predictive analytics purposeful and impactful. This course is intended for those willing to invest in developing skills for superior project design and incremental development to overcome chronic analytic failings. Those who complete this course will be capable of guiding their organization to stand up a thriving internal analytic practice with measurable and residual gains.
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Course Summary (cont’d)

Objectives

After taking this course, students will be able to:

- Plan and manage your predictive modeling projects effectively from the start
- Identify, qualify and prioritize viable and actionable analytic opportunities
- Shift from a limited technology mindset to one of organizational transformation
- Avoid approaches that waste time and expense on doomed analytic projects
- Construct a valid data set and transform data for superior model performance
- Select appropriate methods for each of the four core analytic project types
- Assess the degree to which a model meets a predefined performance objective
- Establish stepwise experimental design for superior predictive model development
- Take a low-risk / high-impact approach to model development with vendor-neutral tool exposure
- Apply a formal roadmap for data preparation, model development and validation of results
- Build an analytics sandbox for rapid model development and reduced IT dependency
- Develop the rare analytic leadership skills to assess, design and oversee actionable projects
- Leave with the resources, contacts and plans to reduce preparation time, costs and risks

Topics

- Core Concepts
- Assess Phase
- Plan Phase
- Prepare Phase
- Model Phase
- The Tasks of the Model Phase
- Validate Phase
- Deploy Phase
- Monitor Phase
- Wrap-up and Next Steps

Audience

This course is designed for:

- IT executives and Big Data directors: CIOs, CAOs, CTOs, Stakeholders, Functional Officers, Technical Directors and Project Managers who desire to transform their deluge of inert data to actionable assets
- Data Scientists: Who recognize the importance of complementing their tactical proficiency with a strategic planning and design approach to advanced analytics
- Technology Planners: Who survey emerging technologies in order to prioritize corporate investment
- Consultants: Whose competitive environment is intensifying and whose success requires competency with data mining and related emerging information technologies

Prerequisites

Registrants will be required to view a three-hour online video “Core Concepts” orientation prior to attending this event. Access details to the Core Concepts video modules will be shared with participants prior to the start of the course. Prior education or experience in data analytics or statistics is helpful, but not required. Participants need only supply a laptop computer with Microsoft Excel. Instructions on how to download exercise data and any analytic tools will be provided in the preparatory email. The instructor can assist participants with any preparation during breaks, and before or after class.

Duration

Five days

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Course Outline

I. Core Concepts
   A. Prerequisite Three-Hour Preparatory Orientation
   B. View the full Core Concepts Prerequisite Description

II. Assess Phase
   A. Assemble Team
   B. Leadership, Analysts, Subject Experts, Data Support, Stakeholders, etc
   C. Determine Whether External Talent is Needed
      1. Examine Culture & Mindset
      2. List Candidate Projects
   D. Place Projects on a Benefits / Challenges Quadrant Plot
   E. Guided Discussion Breakout Session
      1. Define Performance Benchmarks
      2. Identify Data Sources
      3. Itemize Existing Analytic Resources
      4. Describe Operational Environments
      5. Initial Report of Overall Practice Readiness
   F. What Should an Assess Phase Report Contain?
   G. Exercise Breakout Session

III. Plan Phase
   A. Pull & Recon Data
   B. Explore Data & Verify Quality
   C. Do We Have Enough Data?
   D. Which Data are Relevant?
   E. Make a First Look at Data Quality
   F. Exercise Breakout Session
      1. Design Analytic Sandbox
      2. Qualify Team
      3. Qualify Tools
      4. Define Operational Environment(s)
      5. Establish Performance Benchmarks & Targets
   G. What are the current metrics (KPIs)?
   H. What is the Role of Technical Metrics vs. KPIs?
   I. Benchmark Demonstration
      1. Consider Deployment Options
      2. Prioritize Viable Projects

IV. Prepare Phase
   A. Initiate Analytic Culture & Mindset Shift
   B. Refine Team Roles & Responsibilities
   C. Build Analytic Sandbox
   D. The Importance of the “Data Recon”
   E. Effective Collaboration Between Analysts and IT
   F. Exercise Breakout Session
      1. Define Performance Benchmarks
      2. Explore Final Data
   G. Comparing Data Requirements to Actual Data
   H. Looking for Potential Problems
   I. Data Exploration Demonstration
      1. Prepare Data
   J. Data Integration
   K. Data Cleaning
   L. Data Construction
   M. Exercise Breakout Session
      1. Select Candidate Modeling Techniques
      2. Develop Roll-out Plan for Go-Live

V. Model Phase
   A. Current Trends in Analytic Modeling, Data Mining and Machine Learning
      2. The Modeling Software Landscape
      4. Do I Need to Know About Statistics to Build Predictive Models?
   B. Strategic and Tactical Considerations in Choosing a Modeling Algorithm
      1. What is an Algorithm?
      2. Is a “Black Box” Algorithm an Option for Me?

VI. The Tasks of the Model Phase
   A. Generate Test Design
      1. Train-Test Validation
      2. Accept or Reject Modeling Parameters
      3. Test / Test / Validate
   B. Optimizing Data for Different Algorithms
   C. Build Models
      1. Classification
         a) Issues Unique to Classification Problems
         b) Why Classification Projects are So Common
         c) An Overview of Classification Algorithms
            (1) Logistic Regression
            (2) Neural Networks
            (3) Naïve Bayes Classification

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Course Outline (cont’d)

VIII. Deploy Phase
A. Change Management for New Decision Process
B. Streamline Data Preparation for Deployment
C. Revisiting Data Prep with an Eye toward Deployment
D. Considering Deployment Options
E. Data Preparation Demonstration
   1. Review All Project Functions
   2. Go Live
   3. Prepare Final Report
   4. Conduct Knowledge Transfer

IX. Monitor Phase
A. Create Maintenance Schedule
B. Assign Monitoring Responsibilities
C. Build Performance Dashboard
D. Who Will be in Charge of Monitoring?
E. How with the Monitoring Information be Updated?
F. Exercise Breakout Session
   1. Define Criteria for Model Refresh or Replace
   2. Develop Monitoring & Maintenance Plan
G. Putting a Proper Plan and Schedule into Place
H. Monitoring Demonstration
   1. Identify New Data Sources
   2. Record Changes to Environment and Organization

X. Wrap-up and Next Steps
A. Supplementary Materials and Resources
B. Conferences and Communities
C. Get Started on a Project!
D. Options for Strategic Oversight and Collaborative Implementation

VII. Validate Phase
A. Select the Most Strategic Model Option(s)
B. Validate Finalist Models
C. Prepare Data for Test Deployment
D. Data Preparation Steps for Production
E. Data Preparation Demonstration
   1. Measure Lift / ROI / Impact
   2. The Potential Challenges of Estimating ROI
   3. Designing an Effective “Dress Rehearsal”
   4. The Basics of A/B testing
F. The Basics of A/B testing
   1. Exercise Breakout Session
   2. Document Validation Process

VI. Exercise Breakout Session and Guided Project Discussion
   a) Evaluate Model Results
   b) Check Plausibility
   c) Check Reliability
   d) Model Accuracy and Stability
   e) Lift and Gains Charts

V. Exercise Breakout Session
   a) Exercise Breakout Session
   1. Create & Document Modeling Plan
   2. Determine Readiness for Deployment
   3. What are Potential Deployment Challenges for Each Candidate Model?
   4. Exercise Breakout Session and Guided Project Discussion

IV. Exercise Breakout Session
   a) Exercise Breakout Session
   1. Times Series
   2. Text Mining
   3. Factor Analysis
   4. Support Vector Machines
   5. Decision Trees
   6. Ensemble Methods
   d) Value Estimation and Regression
   e) Clustering
   f) Association Rules
   g) Other Modeling Techniques

III. Exercise Breakout Session
   a) Exercise Breakout Session
   1. Times Series
   2. Text Mining
   3. Factor Analysis

II. Exercise Breakout Session
   a) Exercise Breakout Session
   1. Times Series
   2. Text Mining

I. Exercise Breakout Session
   a) Exercise Breakout Session
   1. Times Series

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