CASE STUDY

Weather Forecasting Organization Expands Predictive Capabilities with Data Science Training Solutions

CLIENT CHALLENGE

A European weather forecasting organization operates as a research institute as well as an around-the-clock service, producing global numerical weather predictions and other data for its member states and the broader community. Their Scientists, Statisticians, and Programmers manage a high volume of rapidly changing data on a constant 24x7 basis. To achieve this, the organization's data professionals must be at the forefront of programming skills to leverage technology for accurate forecasting.

Leveraging the Learning Tree model of using practicing Consultants to deliver training, Learning Tree was invited as a trusted training partner to support this business need through developing a Data Science Academy addressing the following upskilling topics →

- Jupiter notebooks
- Supervised and unsupervised learning
- Deep learning and interpretability
- Data mining and pattern discovery
- The mathematical basis of machine learning
- Uncertainty quantification
- Gaussian processes

The training was required to be 3-4 days of consistent training for Statisticians and Programmers.

SOLUTION

Through engagement and discussion with our Lead Data Science Consultant, a two-tiered customized solution was firstly developed as a specification and then on approval as a program of courses.

Data Science I

Learning Outcomes

- Focus on Python Programming
- Understand the fundamental ideas behind artificial intelligence and machine learning in particular
- Choose algorithms that would be good candidates to solve a given problem
- Interpret the measurements used to gauge the quality of a model
- Appreciate the workflow needed to produce machine learning solutions

Data Science II

Learning Outcomes

- Understand the fundamental ideas behind deep learning
- Generalize machine learning concepts to Bayesian analysis and Gaussian processes in particular
- Interpret the measurements used to gauge the quality of a model

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This program is unique in its emphasis on a Bayesian approach to modeling rather than the more commonly used "frequentist" approach. The Bayesian approach allows one to combine prior information you have about the phenomenon you are trying to predict with evidence from newer information to make a better prediction. This approach better fits the way a weather prediction organization continuously gets new data. Until the recent past, the Bayesian approach has not been practical because only a few special cases can be solved by hand mathematically. With current computational resources and Monte Carlo methods implemented in Python, it is now a feasible approach to prediction.

RESULTS

To date, **Data Science I** has been delivered three times upskilling 43 Scientists, Statisticians and Programmers. Learner feedback was exceptionally positive with high feedback scores using the Kirkpatrick evaluation model.

What Attendees Are Saying:

"A great effort was made in explaining the theory behind each concept, at the right level of detail."

*"A very good overview of the different data science methods, the **Jupiter notebooks were really helpful.**"*

*"Very good and useful course with **lots of theory and practical examples.**"*

*"Christopher was an excellent lecturer, **very clearly explaining everything.**"*

*"The instructor was very knowledgeable and **provided immediate assistance with any questions.**"*

*"**The trainer made the course very attractive** and he was well organized with the time allocated between teaching and exercises and kept good time schedule. The trainer was helpful when we were in trouble, always available to answer our questions and to explain the outcome of the exercises. **The course was very well organized, everything technically worked properly. Very good experience!**"*

KEY PROGRAM RESULTS

Data Science I ★★★★½

3.63	3.96	91%	99%
out of 4	out of 4		
Average course GPA	Average Instructor GPA	Learner satisfaction in the course	Learner satisfaction in the Instructor

Data Science II ★★★★½

3.77	4.0	94%	100%
out of 4	out of 4		
Average course GPA	Average Instructor GPA	Learner satisfaction in the course	Learner satisfaction in the Instructor

Data Science II has been delivered once upskilling 15 Scientists, Statisticians and Programmers. Again, feedback has been very positive.

Attendees Are Saying:

"Very good course program! We learned so much during these 3 days!
***I really enjoyed the practical exercises, helped me to understand better these concepts.**"*

*"**Very well presented and very clear explanations using practical examples and nice exercises.** You cover so much in only 3 days. I really enjoyed every minute of it! Now I am ready to apply some of those ML concepts, very exciting!"*

*"**Very nice and competent instructor.** Great ability to transmit knowledge. Thank you."*

*"Very professional teacher, overall **he provides a great learning experience.**"*

*"**Thanks to Mr. Mawata for the clarity and expertise for this course.**"*

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Building on the success of the program and 2nd Data Science II course - **Data Science B: Random Forests and Artificial Neural Networks** - has been incorporated into the program for staff who need to:

- Gain the perspective of a Python programmer
- Perform classification and regression using decision trees and ensembles of decision trees
- Understand the fundamental ideas behind deep learning

Data Science B: Random Forests and Artificial Neural Networks

93% Learner satisfaction in the course

100% Learner satisfaction in the Instructor

What Attendees Are Saying:

"Very well presented and very good material, exercises."

"Very good overview of various machine learning algorithms."

"The instructor is very knowledgeable and is very good in explaining complex concepts in simple words."