Training Course on Artificial Intelligence Model Evaluation and Selection

Professional Development Training Course Outline

Category	Artificial Intelligence And Block Chain	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today's rapidly evolving landscape of **Artificial Intelligence (AI)** and **Machine Learning (ML)**, the ability to rigorously **evaluate AI models** and strategically perform **model selection** is paramount for achieving impactful and reliable outcomes. This intensive training course addresses the critical need for professionals to master the techniques and best practices in this vital area. Participants will gain in-depth knowledge of diverse **evaluation metrics**, understand the nuances of different **evaluation methodologies**, and develop the skills to confidently choose the most appropriate **AI model** for specific business problems. Through a blend of theoretical foundations and practical exercises, this course empowers individuals and organizations to optimize their **AI initiatives**, ensuring accuracy, efficiency, and ethical considerations are at the forefront of their **AI development lifecycle**.

This program provides a thorough exploration of the entire **AI model evaluation and selection process**. From understanding the importance of **data quality** and **bias detection** to implementing advanced **statistical analysis** and **performance benchmarking**, learners will acquire a holistic understanding. We delve into the practical application of various **model comparison techniques**, including cross-validation and A/B testing, enabling data scientists, machine learning engineers, and AI practitioners to make informed decisions. By focusing on real-world case studies and hands-on labs, this course ensures that participants can immediately apply their newly acquired skills to their own projects, driving innovation and maximizing the return on investment in **AI technologies**.

Programme Curriculum

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Course Duration

5 days

Course Objectives

Upon completion of this training course, participants will be able to:

1. **Define key evaluation metrics** relevant to different types of **machine learning models**.
2. Apply various **evaluation techniques** such as cross-validation and hold-out validation.
3. Understand the impact of **data preprocessing** on model performance.
4. Identify and mitigate **bias in AI models** using appropriate evaluation strategies.
5. Perform **error analysis** to understand model strengths and weaknesses.
6. Compare the performance of different **AI algorithms** using statistical methods.
7. Select the most appropriate **AI model** based on specific business requirements and constraints.
8. Communicate **model evaluation results** effectively to both technical and non-technical audiences.
9. Implement **performance monitoring** strategies for deployed AI models.
10. Understand the ethical considerations in **AI model evaluation and selection**.
11. Utilize **model interpretation techniques** to gain insights into model behavior.
12. Apply **ensemble methods** and understand their evaluation.
13. Stay updated with the latest **trending AI evaluation practices** and research.

Organizational Benefits

Organizations that invest in this training course will experience several key benefits:

- Equipping teams with robust evaluation and selection skills leads to the deployment of more effective and reliable AI models, increasing the likelihood of project success.
- Selecting the right model early in the development cycle minimizes wasted resources on poorly performing or unsuitable models.

- Data-driven model evaluation provides a solid foundation for making informed business decisions based on accurate AI predictions.
- Rigorous evaluation builds confidence in the performance and fairness of deployed AI applications.
- Understanding and addressing potential biases and limitations in AI models helps to avoid negative consequences and reputational damage.
- Efficient model evaluation and selection accelerate the process of developing and deploying new AI-powered solutions.
- Investing in cutting-edge AI training demonstrates a commitment to employee development and attracts skilled professionals.
- Organizations with strong AI evaluation capabilities can leverage AI more effectively to gain a strategic edge in the market.

Target Audience

This training course is designed for professionals including:

1. Data Scientists
2. Machine Learning Engineers
3. AI Researchers
4. Software Developers working with AI
5. Business Analysts involved in AI projects
6. Project Managers overseeing AI initiatives
7. Technical Leads and Architects
8. Anyone interested in gaining a deep understanding of AI model evaluation and selection.

Course Outline

Module 1: Foundations of AI Model Evaluation

- Understanding the importance of rigorous model evaluation.
- Defining key terminology: accuracy, precision, recall, F1-score.
- Exploring different types of machine learning tasks and their evaluation needs.
- The role of data quality and preprocessing in evaluation.
- Introduction to bias and fairness in AI.

Module 2: Core Evaluation Metrics for Classification

- Detailed analysis of accuracy, precision, recall, and F1-score.
- Understanding the confusion matrix and its applications.
- Receiver Operating Characteristic (ROC) curves and AUC.
- Precision-Recall curves and their interpretation.
- Handling imbalanced datasets in classification evaluation.

Module 3: Evaluation Metrics for Regression and Beyond

- Mean Squared Error (MSE) and Root Mean Squared Error (RMSE).
- Mean Absolute Error (MAE) and R-squared.
- Evaluation metrics for clustering algorithms (e.g., Silhouette score).
- Metrics for natural language processing (NLP) tasks (e.g., BLEU, ROUGE).
- Evaluation in time series forecasting.

Module 4: Model Validation Techniques

- Hold-out validation and its limitations.
- K-fold cross-validation: theory and implementation.
- Stratified cross-validation for imbalanced data.
- Leave-one-out cross-validation (LOOCV).
- Time-based cross-validation for sequential data.

Module 5: Bias Detection and Mitigation in AI Models

- Identifying different types of bias in data and models.
- Quantitative metrics for measuring bias (e.g., disparate impact).
- Techniques for mitigating bias during data preprocessing.
- Bias detection and mitigation strategies during model training.
- Evaluating the effectiveness of bias mitigation efforts.

Module 6: Model Comparison and Selection Strategies

- Statistical tests for comparing model performance.
- Understanding the trade-offs between different models.
- Using visualization techniques for model comparison.
- Ensemble methods and their evaluation (e.g., bagging, boosting).
- Practical considerations for model deployment.

Module 7: Advanced Evaluation and Interpretation Techniques

- Error analysis and identifying common failure modes.
- Techniques for interpreting black-box models (e.g., LIME, SHAP).
- Understanding feature importance and its role in evaluation.
- Performance monitoring of deployed AI models.
- A/B testing for model comparison in production.

Module 8: Ethical Considerations and Future Trends in AI Evaluation

- The ethical implications of biased or poorly evaluated AI models.
- Fairness, accountability, and transparency in AI.
- Regulatory landscape and guidelines for AI evaluation.
- Emerging trends in AI evaluation research.
- Best practices for responsible AI development and deployment.

Training Methodology

This course employs a blended learning approach that combines:

- **Interactive lectures** providing theoretical foundations and real-world examples.
- **Hands-on lab sessions** where participants apply learned concepts using industry-standard tools and datasets.
- **Case studies** analyzing successful and challenging AI evaluation scenarios.
- **Group discussions** fostering collaboration and knowledge sharing.
- **Individual assignments** to reinforce learning and assess understanding.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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