

Explainable AI (XAI)

COURSE CONTENT

GET IN TOUCH



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About Multisoft

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About Course

Explainable AI (XAI) Training equips professionals with the knowledge required to interpret, validate, and explain the decisions made by machine learning and deep learning models. The course explores explainability techniques, model transparency, feature importance, SHAP, LIME, bias detection, fairness evaluation, counterfactual explanations, and responsible AI principles. Through practical implementation and industry-focused case studies, participants will learn how to develop transparent, trustworthy, and compliant AI solutions for enterprise applications.

Module 1: Introduction to Explainable AI (XAI)

- ✓ Fundamentals of Explainable AI
- ✓ Importance of AI Transparency
- ✓ Interpretable vs. Black-Box Models
- ✓ Explainability Challenges in AI
- ✓ XAI Use Cases Across Industries
- ✓ Regulatory and Business Drivers

Module 2: Machine Learning Interpretability Fundamentals

- ✓ Understanding Model Interpretability
- ✓ Local and Global Interpretability
- ✓ Feature Importance Concepts
- ✓ Model Behavior Analysis
- ✓ Decision Boundary Interpretation
- ✓ Performance vs. Explainability Trade-offs

Module 3: Model-Specific Explainability Techniques

- ✓ Linear Model Interpretation
- ✓ Decision Tree Explainability
- ✓ Rule-Based Model Analysis
- ✓ Random Forest Feature Importance
- ✓ Gradient Boosting Interpretation
- ✓ Model Visualization Techniques

Module 4: Model-Agnostic Explainability Methods

- ✓ Introduction to Model-Agnostic Techniques
- ✓ LIME (Local Interpretable Model-Agnostic Explanations)
- ✓ SHAP (SHapley Additive exPlanations)
- ✓ Partial Dependence Plots (PDP)
- ✓ Individual Conditional Expectation (ICE)
- ✓ Counterfactual Explanations

Module 5: Explainability for Deep Learning Models

- ✓ Explainability Challenges in Neural Networks
- ✓ Gradient-Based Explanation Methods
- ✓ Integrated Gradients
- ✓ Grad-CAM
- ✓ Attention Visualization
- ✓ Explainable Computer Vision and NLP Models

Module 6: Explainability Frameworks and Libraries

- ✓ Introduction to XAI Libraries
- ✓ Implementing SHAP
- ✓ Working with LIME
- ✓ Captum for PyTorch
- ✓ TensorFlow Explainability Tools
- ✓ Visualization and Interpretation Dashboards

Module 7: Fairness, Bias, and Responsible AI

- ✓ Understanding Algorithmic Bias
- ✓ Fairness Metrics
- ✓ Bias Detection Techniques
- ✓ Bias Mitigation Strategies
- ✓ Responsible AI Principles
- ✓ Ethical AI Development Practices

Module 8: Evaluating Explainability

- ✓ Measuring Explanation Quality
- ✓ Fidelity and Consistency
- ✓ Human-Centered Evaluation
- ✓ Trust and Reliability Assessment
- ✓ Comparing Explainability Methods
- ✓ Validation Best Practices

Module 9: Explainable AI in Enterprise Applications

- ✓ Explainability in Financial Services
- ✓ Healthcare AI Transparency
- ✓ Manufacturing and Predictive Analytics
- ✓ Retail and Customer Intelligence
- ✓ Risk Assessment Applications
- ✓ Regulatory Compliance Requirements

Module 10: AI Governance and Production Deployment

- ✓ AI Governance Frameworks
- ✓ Model Monitoring and Drift Detection
- ✓ Explainability in MLOps
- ✓ Compliance and Audit Readiness
- ✓ Model Documentation
- ✓ Enterprise Deployment Best Practices

Module 11: Hands-on Projects and Industry Case Studies

- ✓ Interpreting Classification Models
- ✓ Explaining Regression Models
- ✓ Deep Learning Explainability Project
- ✓ Fairness Assessment Case Study
- ✓ Enterprise XAI Implementation
- ✓ End-to-End Explainable AI Project