Explainable AI (XAI) for Research Transparency Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In an era where artificial intelligence (AI) is transforming research across disciplines, ensuring transparency and accountability in machine learning models has become essential. Explainable AI (XAI) for Research Transparency Training Course equips professionals, academics, and industry leaders with the skills and knowledge to design, evaluate, and implement interpretable AI systems. With growing concerns over algorithmic bias, ethical AI, and compliance with regulatory frameworks such as GDPR, understanding XAI is not just valuable—it's imperative.

This course integrates cutting-edge tools like SHAP, LIME, and counterfactual explanations with real-world research applications, making it ideal for both beginners and seasoned data scientists. Participants will learn to assess model decisions, enhance model auditability, and communicate AI insights to non-technical stakeholders. Through hands-on projects, case studies, and collaborative exercises, learners will build expertise in fostering responsible and transparent AI-driven research.

Programme Curriculum

Explainable AI (XAI) for Research Transparency Training Course

Introduction

In an era where artificial intelligence (AI) is transforming research across disciplines, ensuring transparency and accountability in machine learning models has become essential. Explainable AI (XAI) for Research Transparency Training Course equips professionals, academics, and industry leaders with the skills and knowledge to design, evaluate, and implement interpretable AI systems. With growing concerns over algorithmic bias, ethical AI, and compliance with regulatory frameworks such as GDPR, understanding XAI is not just valuable—it's imperative.

This course integrates cutting-edge tools like SHAP, LIME, and counterfactual explanations with real-world research applications, making it ideal for both beginners and seasoned data scientists. Participants will learn to assess model

decisions, enhance model auditability, and communicate AI insights to non-technical stakeholders. Through hands-on projects, case studies, and collaborative exercises, learners will build expertise in fostering responsible and transparent AI-driven research.

Course Objectives

1. Understand the fundamentals of Explainable AI (XAI) and its importance in modern research.
2. Identify key challenges in AI transparency and ethical decision-making.
3. Utilize model-agnostic explanation techniques like SHAP, LIME, and Grad-CAM.
4. Implement interpretable machine learning models using Python.
5. Evaluate the trade-offs between model accuracy and interpretability.
6. Detect and mitigate algorithmic bias in research datasets.
7. Apply XAI frameworks to healthcare, finance, and social science research.
8. Visualize model decisions for stakeholder communication.
9. Integrate explainability into the AI model lifecycle.
10. Conduct audits for AI-driven research workflows.
11. Leverage XAI in regulatory compliance and responsible AI initiatives.
12. Develop reproducible research pipelines with interpretable outputs.
13. Critically analyze published XAI applications in peer-reviewed journals.

Target Audiences

1. Research Scientists and Academic Scholars
2. Data Scientists and Machine Learning Engineers
3. AI Policy Makers and Government Regulators
4. Healthcare Informatics Professionals
5. Financial Risk Analysts and Auditors
6. Ethics and Compliance Officers
7. PhD and Postgraduate Students in AI Fields
8. Journalists and Communicators in Tech and Science

Course Duration: 5 days

Course Modules

Module 1: Introduction to Explainable AI

- History and evolution of XAI
- Need for transparency in AI research
- Black-box vs. white-box models
- Legal and ethical implications of opaque AI
- Popular open-source XAI libraries
- **Case Study**: Comparing model interpretability in fraud detection

Module 2: Model-Agnostic Explainability Tools

- SHAP (SHapley Additive exPlanations) overview
- LIME (Local Interpretable Model-agnostic Explanations) usage
- Global vs. local explanations
- Visualizations with SHAP and LIME
- Feature importance interpretation
- **Case Study**: SHAP for diagnosing diabetes in medical research

Module 3: Interpretable Machine Learning Models

- Transparent model design (decision trees, rule-based models)

- Comparison with complex models (deep learning, ensembles)
- Fairness vs. performance
- Model training for explainability
- Post-hoc explanation strategies
- **Case Study**: Interpretable model for student performance prediction

Module 4: Bias and Fairness in AI

- Sources of bias in training data
- Bias detection methods (Disparate Impact, FairLearn)
- Fair model evaluation metrics
- Ethical considerations in deployment
- Strategies to minimize bias
- **Case Study**: Identifying gender bias in hiring algorithms

Module 5: XAI for Stakeholder Communication

- Simplifying AI for non-technical users
- Creating intuitive visualizations and dashboards
- Crafting narratives using AI outputs
- Enhancing trust through transparency
- Building interactive explainability tools
- **Case Study**: Explaining loan approval AI to finance clients

Module 6: XAI in Domain-Specific Research

- Healthcare (e.g., clinical decision support)
- Finance (e.g., risk assessment and lending)
- Social Sciences (e.g., public policy models)
- Environmental models and climate forecasting
- Adapting explanations across domains
- **Case Study**: Transparent AI in COVID-19 forecasting models

Module 7: Integrating XAI in the ML Lifecycle

- Incorporating XAI at model design stage
- Validation and continuous improvement
- Tools for reproducibility and tracking
- Interdisciplinary collaboration for XAI
- Documentation for transparency
- **Case Study**: Full XAI pipeline for academic publishing

Module 8: Future Trends and Challenges in XAI

- XAI and generative AI (LLMs, diffusion models)
- Human-AI collaboration and co-exploration
- XAI for regulatory and policy frameworks
- Open challenges in interpretability research
- Building a career in XAI research
- **Case Study**: Evaluating GPT explanations in research synthesis

Training Methodology

- Interactive instructor-led sessions
- Hands-on lab exercises with real datasets
- Group case studies and peer reviews

- Weekly quizzes and concept reinforcement
- Final capstone project on explainability in your research domain
- Access to cloud-based XAI tools and collaborative platforms

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

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com