Artificial Intelligence in Target Identification Training Course

Professional Development Training Course Outline

Category	Biotechnology and Pharmaceutical Development	**Duration**	10 Days
Base Fee	$4,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The advent of Artificial Intelligence has fundamentally transformed the process of target identification, moving beyond laborious, traditional methods. In data-intensive industries from Genomics and Multi-omics in life sciences to Threat Intelligence in defense and Customer Segmentation in marketing the sheer volume and complexity of information demand a computational paradigm shift. Artificial Intelligence in Target Identification Training Course focuses on the application of Deep Learning, Predictive Analytics, and advanced Machine Learning models to swiftly and accurately sift through massive, heterogeneous datasets. Graduates will master the art of feature engineering and model optimization, accelerating the target pipeline and achieving a significant competitive advantage by focusing resources on the highest-probability targets.

This program is essential for professionals seeking to lead data-driven decision-making in their organizations. We bridge the gap between theoretical AI concepts and real-world problem-solving, utilizing a hands-on methodology centered on Python and leading AI frameworks. Participants will gain proficiency in building robust models for tasks such as identifying novel therapeutic targets, pinpointing financial fraud anomalies, or segmenting high-value market prospects. The curriculum emphasizes not just the technical skills but also the crucial aspects of Model Interpretability (XAI), Bias Mitigation, and adherence to Ethical AI standards, ensuring all target identification efforts are both powerful and responsible.

Programme Curriculum

Artificial Intelligence in Target Identification Training Course

Introduction

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Course Duration

10 days

Course Objectives

Upon completion, participants will be able to:

1. Master the application of Deep Learning Architectures for analyzing complex Multi-omics data.
2. Design and implement Machine Learning pipelines to accelerate the Target Validation process.
3. Utilize Natural Language Processing (NLP) and Large Language Models (LLMs) for Scientific Literature Mining and knowledge graph construction.
4. Apply Predictive Modeling techniques to forecast target Viability and Efficacy in pharmaceutical and defense contexts.
5. Perform advanced Feature Engineering on high-dimensional data for optimal model performance.
6. Develop and deploy AI models that ensure high Precision Targeting while minimizing False Positives.
7. Integrate and harmonize Heterogeneous Datasets using data fusion techniques.
8. Implement strategies for Explainable AI (XAI) to interpret model predictions and foster Stakeholder Trust.
9. Identify and mitigate Algorithmic Bias in training data to ensure Fairness and Transparency in target selection.
10. Apply AI for Anomaly Detection and Threat Prioritization in a Cybersecurity or Financial Risk Management context.
11. Build Customer Segmentation models using unsupervised learning to identify High-Value Prospects (HVP) and Micro-targeting opportunities.
12. Leverage cloud-based MLOps principles for the robust deployment and continuous monitoring of target identification models.
13. Formulate a comprehensive AI Strategy for target identification that maximizes Return on Investment (ROI) and R&D efficiency.

Target Audience

1. Pharmaceutical & Biotech Researchers.
2. Data Scientists & ML Engineers.
3. Cybersecurity & Threat Intelligence Analysts.

4. Financial Risk & Fraud Analysts.
5. Marketing & Sales Strategists.
6. Bioinformatics & Computational Biologists
7. Product/Project Managers.
8. Defense & Intelligence Community Analysts.

Course Modules

Module 1: Foundations of AI for Target Identification

- Defining the Target Identification problem across different sectors
- Overview of traditional and AI-driven approaches.
- Machine Learning, Deep Learning, and Reinforcement Learning
- Structured, Unstructured, and Heterogeneous data sources.
- Case Study: Comparing the timelines of traditional vs. AI-accelerated drug target screening.

Module 2: Data Preprocessing and Feature Engineering

- Techniques for Data Cleaning, Normalization, and Missing Value Imputation for complex data.
- Feature Engineering
- Dimensionality Reduction for high-dimensional datasets.
- Handling imbalanced data.
- Case Study: Feature creation from raw genomic data to represent protein-protein interaction networks.

Module 3: Supervised Learning for Classification & Prediction

- Implementing Classification Algorithms
- Model evaluation metrics specific to target ID
- Hyperparameter tuning and cross-validation techniques.
- Introduction to advanced Ensemble Methods
- Case Study: Using Random Forest to classify high- vs. low-efficacy drug targets from initial screening data.

Module 4: Deep Learning Architectures (DL-I)

- Fundamentals of Artificial Neural Networks and backpropagation.
- Designing and training Convolutional Neural Networks
- Applications of CNNs in image analysis for histology, radiology, and satellite imagery.
- Understanding loss functions and optimizers for deep models.
- Case Study: Deploying a CNN for rapid identification of cancerous cell morphology in high-throughput microscopy.

Module 5: Deep Learning Architectures

- Recurrent Neural Networks and Long Short-Term Memory for sequential data.
- Graph Neural Networks.
- Introduction to Transformer models and their role in advanced NLP.
- Utilizing pre-trained models for new target ID tasks.
- Case Study: Using GNNs to model a disease-gene-drug knowledge graph to predict novel drug targets.

Module 6: Multi-omics Data Analysis

- Working with Genomics, Transcriptomics, and Proteomics datasets.
- AI-driven methods for integrating diverse -omics data
- Gene expression analysis and pathway enrichment using ML.
- Identifying novel biomarkers and drug resistance mechanisms.
- Case Study: Integrating transcriptomic and clinical data via ML to stratify patient subpopulations for clinical trials.

Module 7: NLP for Scientific & Threat Intelligence Mining

- Text Preprocessing
- Named Entity Recognition (NER) for extracting key entities from unstructured text.
- Sentiment Analysis and relationship extraction from reports and scientific abstracts.
- Using LLMs for summarization and creating structured databases from literature.
- Case Study: Applying BERT to analyze open-source threat intelligence reports for adversary infrastructure identification.

Module 8: Predictive Analytics for Target Viability

- Time-series forecasting models for market or threat evolution.
- Survival Analysis.
- Developing Risk Scoring Models for financial and security targets.
- Quantifying uncertainty and providing probability estimates with predictions.
- Case Study: Building a predictive model to estimate the Phase III clinical trial success probability for a newly identified drug target.

Module 9: AI in Cybersecurity Target Identification

- Anomaly Detection algorithms for detecting zero-day attacks and insider threats.
- Network Traffic Analysis using ML for identifying malicious communication patterns.
- Targeting high-value attack vectors and vulnerabilities for patch prioritization.
- Building models to predict adversary movements and resource targeting
- Case Study: Implementing an Autoencoder to detect fraudulent credit card transactions based on behavioral anomalies.

Module 10: AI in Customer Segmentation & Micro-targeting

- Unsupervised Learning.
- Recency, Frequency, Monetary analysis enhanced by ML for high-value prospect identification.
- Micro-targeting strategies using granular behavioral and demographic data.
- Developing propensity models to predict churn or high conversion likelihood.
- Case Study: Using K-Means clustering on e-commerce data to identify distinct high-value shopper segments for personalized campaigns.

Module 11: Explainable AI (XAI) for Target Identification

- The necessity of Model Interpretability in high-stakes targeting decisions.
- Local Interpretability methods for explaining individual target predictions.
- Global Interpretability
- Communicating model rationale to non-technical stakeholders
- Case Study: Interpreting a deep learning model's decision to classify a molecule as a viable target using SHAP values.

Module 12: Ethical AI and Bias Mitigation

- Identifying sources of Algorithmic Bias in target ID datasets
- Metrics for measuring fairness
- Techniques for bias mitigation at pre-processing, in-processing, and post-processing stages.
- Regulatory and Compliance considerations for AI in sensitive fields
- Case Study: Analyzing and mitigating racial bias in a healthcare model used for identifying patients most likely to benefit from a new treatment.

Module 13: Introduction to MLOps for Target Models

- Principles of MLOps
- Containerization and Orchestration for scalable deployment.
- Detecting Data Drift and Model Decay in production.
- Versioning and Reproducibility for data, code, and trained models.
- Case Study: Setting up an automated MLOps pipeline to continuously retrain a financial fraud detection model as new data streams in.

Module 14: Target Identification in Financial Risk Management

- AI for Anti-Money Laundering and suspicious activity detection.
- Graph-based models to trace financial networks and identify hidden relationships.
- Predicting loan defaults and identifying high-risk clients/organizations.
- Real-time processing challenges for high-frequency transaction data.
- Case Study: Utilizing social network analysis and GNNs to identify central figures in a complex organized financial crime ring.

Module 15: Future Trends and Capstone Project

- Generative AI for de novo design
- Federated Learning for cross-organizational target ID
- Quantum Computing's potential impact on large-scale simulation and modeling.
- Review of open-source AI tools and platforms relevant to target identification.
- Capstone Project: Presenting the design, implementation, and evaluation of the final AI target identification solution.

Training Methodology

The course employs an intensive, Blended Learning approach combining theory and practice:

- Instructor-Led Lectures.
- Hands-on Labs & Coding Sessions
- Real-World Case Studies & Simulations.
- Final Project.
- Peer Collaboration & Code Review.

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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

Register Online Now