Automated Machine Learning (AutoML) for Researchers 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

Automated Machine Learning (AutoML) is revolutionizing the way data science and artificial intelligence are applied across industries, empowering researchers to streamline model development, optimize performance, and extract insights from large datasets with minimal coding. Automated Machine Learning (AutoML) for Researchers Training Course is designed to equip researchers with hands-on experience and practical knowledge of leading AutoML platforms such as Google AutoML, H2O.ai, Auto-Sklearn, TPOT, and Amazon SageMaker Autopilot. By mastering these tools, participants can accelerate the research process and produce highly accurate, reproducible models for complex data-driven problems.

With the rise in AI adoption across academic and commercial research, AutoML is a trending solution for handling model selection, hyperparameter tuning, and feature engineering without deep programming expertise. This course covers end-to-end automated machine learning workflows, practical use cases, and integration with data science tools like Jupyter, Python, and R. Participants will learn through real-world case studies, including biomedical research, climate data modeling, financial forecasting, and social science analytics.

Programme Curriculum

Automated Machine Learning (AutoML) for Researchers Training Course

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Course Objectives

1. Understand the core concepts of AutoML and its applications in research.
2. Explore popular AutoML tools and platforms (e.g., Google AutoML, H2O.ai).
3. Automate data preprocessing and feature engineering.
4. Implement model selection and hyperparameter optimization using AutoML.
5. Evaluate and compare model performance metrics.
6. Integrate AutoML with Python, R, and Jupyter environments.
7. Handle imbalanced and unstructured data using AutoML techniques.
8. Apply AutoML to real-world datasets in healthcare, finance, and climate research.
9. Interpret AutoML results with explainable AI (XAI) tools.
10. Enhance reproducibility and transparency in research using AutoML workflows.
11. Leverage cloud-based AutoML services for scalable model training.
12. Design custom AutoML pipelines for domain-specific problems.
13. Publish and document research using AutoML insights and visualizations.

Target Audiences

1. Academic Researchers
2. Data Scientists
3. Research Assistants
4. Healthcare Analysts
5. Climate & Environmental Scientists
6. Social Science Researchers
7. Financial Analysts
8. Graduate Students in AI/ML

Course Duration: 5 days

Course Modules

Module 1: Introduction to AutoML

- Definition and scope of AutoML
- Benefits and limitations in research contexts
- Overview of leading AutoML tools
- Case examples of AutoML in academia
- AutoML vs traditional machine learning
- **Case Study:** Predictive modeling in epidemiological research

Module 2: Data Preprocessing & Feature Engineering

- Automating data cleaning and transformation
- Feature selection techniques using AutoML
- Encoding categorical variables
- Handling missing values
- Time-series and text data preprocessing

- **Case Study:** Climate data preparation using AutoML

Module 3: Model Selection and Hyperparameter Tuning

- AutoML for classification and regression problems
- Ensemble methods and neural architecture search
- Tuning algorithms (Bayesian, grid, random search)
- Evaluating model performance
- Best practices in research validation
- **Case Study:** Financial forecasting model selection

Module 4: Explainable AI & Interpretability

- Introduction to model interpretability
- SHAP, LIME, and other XAI tools
- Visualizing AutoML model decisions
- Addressing bias and fairness
- Reporting results in scientific publications
- **Case Study:** Healthcare diagnostics model with SHAP

Module 5: Integrating AutoML with Python and Jupyter

- Setting up AutoML environments in Python
- Using AutoML libraries (TPOT, Auto-Sklearn)
- Visualizing outputs in Jupyter Notebooks
- Version control and experiment tracking
- Real-time model monitoring
- **Case Study:** Social media sentiment analysis pipeline

Module 6: Cloud-based AutoML Platforms

- Introduction to Google Cloud AutoML, Amazon SageMaker
- Configuring AutoML on cloud platforms
- Data storage and security in cloud-based ML
- Model deployment and scaling
- Cost analysis and budget-friendly options
- **Case Study:** Agricultural yield prediction on Google AutoML

Module 7: Custom AutoML Pipelines

- Building custom pipelines using H2O.ai and MLJAR
- Automated retraining strategies
- Incorporating domain knowledge into AutoML
- Using APIs for real-time data feeds
- Ensuring reproducibility
- **Case Study:** Real-time energy consumption forecasting

Module 8: Ethics, Governance & Research Documentation

- Ethical considerations in automated modeling
- Data privacy and security in research
- Transparent documentation of AutoML pipelines
- Sharing reproducible research with collaborators
- Preparing for peer-reviewed publication
- **Case Study:** Policy research using protected demographic data

Training Methodology

- Hands-on lab sessions using real datasets
- Step-by-step guided Jupyter notebooks
- Video tutorials and live instructor Q&A
- Assignments with personalized feedback
- Group case study presentations
- Research-focused discussion forums

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

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