

Deep Learning Models and Architectures Foundation Course

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Overview

Deep Learning Models and Architectures Foundation Course is a one-week foundation course for analysts, junior data scientists, technical professionals, and managers, who leave with a Deep Learning Architecture Selection Canvas. Participants examine neural network components, training and validation, feedforward, convolutional, sequence, and transformer models, transfer learning, evaluation, overfitting, and responsible use through guided demonstrations. The course links data types and tasks to suitable model families. Agile Leaders Training Center provides training in deep learning models and architectures.

Who Should Attend

- Data teams responsible for exploring model options for business problems
- Technical teams responsible for discussing deep learning requirements
- Analytics teams responsible for evaluating model results and limitations
- Project teams responsible for selecting feasible AI approaches
- Managers responsible for reviewing deep learning proposals and risks

The course assumes participants can interpret basic data and charts and leaves out advanced mathematics, production deployment, API development, and model coding labs.

Departments and Industries

The course supports foundation-level deep learning decisions across data, technology, and business functions.

- Data analytics, data science, information technology, and innovation
- Operations, quality, research, and product development
- Healthcare, financial services, and professional services
- Manufacturing, logistics, retail, and telecommunications
- Education, media, and customer service

Learning Objectives

By the end of this course, participants will be able to:

- Analyze neural network layers, activations, loss, and training flow
- Compare feedforward, convolutional, sequence, and transformer architectures
- Apply architecture selection criteria to data and tasks
- Evaluate validation results, loss curves, and performance metrics
- Diagnose overfitting, bias, and data-quality limitations
- Build a deep learning architecture selection canvas

Course Agenda

Day 1: Neural Network Foundations

- Input, Hidden, and Output Layer Map
- Weight, Bias, and Activation Function Diagram
- Forward Pass and Prediction Flow
- Loss Function and Learning Objective Card
- Gradient-Based Training Concept Demonstration

Day 2: Training and Validation

- Training, Validation, and Test Data Split
- Epoch, Batch, and Learning Rate Control Sheet
- Loss Curve Interpretation Guide
- Underfitting and Overfitting Diagnostic
- Regularization and Early-Stopping Decision

Day 3: Architecture Families

- Feedforward Network Use-Case Matrix
- Convolutional Neural Network Feature Map
- Recurrent and Sequence Model Flow
- Transformer Attention Concept Diagram
- Architecture Family Comparison Table

Day 4: Applications and Evaluation

- Image, Text, Sequence, and Tabular Task Map
- Transfer Learning Suitability Checklist
- Classification and Regression Metric Card
- Baseline-to-Model Performance Comparison
- Bias, Explainability, and Human Review Check

Day 5: Architecture Selection Practice

- Suggested Exercise: Map Data Type to Model Family
- Suggested Exercise: Diagnose Training Curves
- Suggested Exercise: Compare Model Evaluation Evidence
- Suggested Exercise: Review Bias and Use Boundaries
- Capstone Exercise: Deep Learning Architecture Selection Canvas

Practical Exercises

The course uses suggested activities to turn architecture concepts into reviewable selection decisions.

- Suggested activity: trace inputs, layers, activations, predictions, loss, and training flow in a guided model demonstration
- Suggested activity: interpret learning curves and distinguish underfitting, overfitting, and unstable training
- Suggested activity: compare feedforward, convolutional, sequence, transformer, and transfer-learning options
- Suggested activity: select an architecture using task, data, metrics, limitations, bias, and human-review criteria

FAQs

Who suits deep learning models and architectures foundation training?

Deep learning foundation training suits analysts, junior data scientists, technical professionals, project teams, and managers who interpret data and need to compare model families without an advanced coding course.

How does deep learning architecture training differ from general machine learning training?

Deep learning architecture training concentrates on layered neural networks, training behavior, and model families such as convolutional, sequence, and transformer architectures. General machine learning training covers a wider range of statistical and algorithmic methods.

Which deep learning architecture suits image, text, or sequence data?

Architecture suitability depends on the task, data structure, volume, labels, baseline, constraints, and evaluation evidence. Convolutional, sequence, transformer, and feedforward models each provide different inductive structures and tradeoffs.

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How are deep learning models evaluated?

Deep learning models are evaluated with task-relevant metrics, validation and test data, learning curves, baseline comparisons, error analysis, bias checks, and human review of practical consequences.

What causes overfitting in deep learning models?

Overfitting occurs when a model fits training patterns more closely than it generalizes to unseen data. Data quality, model complexity, training duration, and regularization choices all affect the pattern.

Conclusion

Participants take back a Deep Learning Architecture Selection Canvas connecting the task, data, model family, training behavior, evaluation evidence, limitations, bias, and review needs. It makes architecture discussions clearer and more consistent. It supports informed decisions about when a model family is suitable and what evidence remains necessary.

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