



Australian Government

ICTAII502 Train and evaluate machine learning models

Release: 1

ICTAI502 Train and evaluate machine learning models

Modification History

Release	Comments
Release 1	This version first released with the Information and Communications Technology Training Package Version 8.0. Newly created unit of competency to address in-demand skills needs.

Application

This unit describes the skills and knowledge required to train and evaluate the operations of machine learning (ML) models when processing previously unseen data.

The unit applies to individuals who may work across a wide range of information and communications technology (ICT) roles, including support technicians, system administrators, programmers and cloud computing engineers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Artificial intelligence

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Evaluate data requirements	1.1 Confirm work brief and tasks according to organisational policies and procedures 1.2 Analyse ML requirements according to cross-industry standard process for data mining (CRISP-DM) methodology, where required 1.3 Confirm input machine training data source according to work brief 1.4 Confirm that data attribute names contain target according to work brief 1.5 Review data transformation instructions according to work

ELEMENT	PERFORMANCE CRITERIA
	brief 1.6 Confirm that default and non-default training parameters control required learning algorithm according to work brief
2. Arrange machine training datasets	2.1 Set machine training data parameters according to work brief 2.2 Select model size according to work brief 2.3 Use selected parameter and feature engineering on required training data 2.4 Finalise machine training data procedures according to work brief
3. Arrange validation datasets	3.1 Set validation data parameters according to work brief 3.2 Select model size according to work brief 3.3 Use selected parameter and feature engineering on required validation data 3.4 Identify any functionality issues of parameters 3.5 Refine ML parameters according to work brief
4. Arrange test datasets	4.1 Set test data parameters according to work brief 4.2 Select model size according to work brief 4.3 Use selected parameter and feature engineering on required test data 4.4 Identify and rectify any functionality issues in test dataset 4.5 Finalise test data procedures according to work brief
5. Finalise ML evaluations	5.1 Review target data outputs according to work brief 5.2 Adjust model based on any discrepancies of outputs, where required 5.3 Record predictive accuracy of ML model according to work brief 5.4 Run variables through ML model and record outputs 5.5 Compare outputs returned by ML model against target data outputs 5.6 Document metrics and accuracy of ML data predictions according to organisational policies and procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

Skill	Description
Numeracy	- Extracts, interprets and comprehends statistical data in the context of training and evaluating ML models - Calculates data inputs and outputs to interpret metric results and outputs and evaluate accuracy
Reading	- Interprets technical information presented in graphic, diagrammatic and visual form - Interprets information from tables and charts
Writing	Compiles documentation with input from a range of data sources and outputs
Problem solving	Applies problem-solving processes to identify actions required to support resolution of organisational problems
Initiative and enterprise	Identifies and follows organisational protocols and procedures

Unit Mapping Information

No equivalent unit. Newly created unit.

Links

Companion Volume Implementation Guide is found on VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTAI502 Train and evaluate machine learning models

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- train at least one machine learning (ML) model, where the work must include one of the following:
 - training using unsupervised ML techniques
 - training using supervised ML techniques
- evaluate the operations of at least one the above trained ML models, where the evaluation must include one of the following:
 - unsupervised ML techniques
 - supervised ML techniques.

In the course of the above, the candidate must:

- produce documentation of all performed work tasks in required organisational formats
- apply required organisational policies and procedures.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- key features and functions of supervised and unsupervised ML techniques
- key features and functions of ML, including:
 - data sources
 - training, validation and test data
 - attribute names
 - target data

- default and non-default parameters
- feature engineering
- learning algorithms
- model sizes
- metrics
- procedures for training, testing and validating data parameters
- key methods to determine ML deployment requirements for end users, including:
 - cross-industry standard process for data mining (CRISP-DM) methodology
 - software development methodology
- method to determine predictive accuracy of ML models using target data
- method to compare predictions returned by ML models against known target values
- key features and functions of industry-recognised ML models that may be trained and evaluated
- organisational formats used for documenting ML model evaluations
- organisational policies and procedures, and legislative requirements relating to work tasks.

Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- industry-recognised ML models that may be trained and evaluated
- software in which ML models can be trained, validated, tested and evaluated
- work brief and organisational policies and procedures required to demonstrate the performance evidence.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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