

✔ **Congratulations! You passed!**

Grade received **100%** To pass 80% or higher

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## AutoML

Total points 9

1. Can Neural Architecture Search (NAS) be seen as a subfield of AutoML?

1 / 1 point

☐ No

☒ Yes

✔ **Correct**

Exactly! NAS can be seen as a subfield of AutoML and has significant overlap with hyperparameter optimization and meta-learning.

2. Which of the following are dimensions of the Neural Architecture Search (NAS) technique? (Select all that apply)

1 / 1 point

☒ Performance Estimation Strategy

✔ **Correct**

You got it! The objective of NAS is typically to find an architecture with the highest predictive performance.

☒ Search Strategy

✔ **Correct**

Keep it up! The search strategy details how to explore the search space.

☒ Search Space

✔ **Correct**

Right! The search space defines the range of architectures that can be represented.

☐ Training and Validation of the Architecture

3. What does the search space allow in Neural Architecture Search (NAS)? (Select all that apply)

1 / 1 point

☒ Restricting unbounded search spaces to have a maximum depth.

✔ **Correct**

Great job! It gives rise to search spaces with (potentially many) conditional dimensions.

☐ Defining how we explore the search space.

☒ Reducing the size of the search space incorporating prior knowledge about well-suited properties.

✔ **Correct**

That's right! This task can simplify the search space.

☒ Defining which neural architectures we might discover in principle.

☒ **Correct**

You're right on track!. The search space defines which architectures can be represented.

4. In the chain-structured Neural Network Architecture (NNA), space is parametrized by (Select all that apply):

1 / 1 point

☒ A number of n sequentially fully-connected layers.

☒ **Correct**

Spot on! A chain-structured NNA can be written as a sequence of n layers.

☒ The operation every layer can execute.

☒ **Correct**

Excellent!. Among the most common operations are pooling, convolution, and more advanced layers.

☒ Hyperparameters associated with the operation.

☒ **Correct**

Well done! Search space is related to the number of units for fully connected networks.

☐ The multiple branches with additional layers types and skip connections.

5. What are the main features of **Automated Machine Learning** (AutoML)? (Select all that apply)

1 / 1 point

☐ AutoML is the process of automating architecture engineering and finding the design of machine learning models.

☒ AutoML technologies democratize AI with customized state-of-the-art machine learning.

☒ **Correct**

That's true! AutoML seeks to make state-of-the-art machine learning approaches accessible to data scientists with limited machine learning expertise.

☒ AutoML aims to automate the decision-making in a data-driven and objective way.

☒ **Correct**

Correct! AutoML determines the approach that works best for a certain application.

☒ AutoML aims to automate the end-to-end process of machine learning to produce simpler and faster solutions.

☒ **Correct**

Indeed! AutoML enables developers -even those with minimal experience in machine learning- to readily produce simple, optimal solutions.

6. What are the two main types of search spaces?

1 / 1 point

☐ Long and Short

☐ Big and Small

☐ Complex and Simple

☒ Macro and Micro

✓ **Correct**

Good job! Although their names are kind of backwards, that's what they're called.

7. In measuring AutoML efficacy, several strategies have been proposed to reduce performance cost estimation, including (Select all that apply):

1 / 1 point

☒ Lower fidelity estimates

✓ **Correct**

Yes! Lower fidelity estimates try to reduce the training time by reframing the problem.

☒ Learning Curve Extrapolation

✓ **Correct**

Nicely done! Extrapolation is a sensitive and valid choice based on the assumption that the learning curve can be reliably predicted.

☐ Reinforcement learning

☒ Weight Inheritance/ Network Morphisms

✓ **Correct**

Nailed it! Using network morphism, the weights of novel architectures are initialized based on the weights in previously trained architectures.

8. The **lower fidelity estimates** are a performance estimation strategy that allows (Select all that apply):

1 / 1 point

☐ Training for a few epochs

☒ Training on lower-resolution

✓ **Correct**

That's it! The lower fidelity reduces the computational cost as a result.

☒ Training on a subset of the data

✓ **Correct**

Correct! It also reduces training times.

☒ Training with less filters per layer

✓ **Correct**

Way to go! The lower fidelity estimates strategy uses fewer filters per layer and fewer cells.

9. Can **network morphism** modify an architecture while leaving the network's function unchanged?

1 / 1 point

☒ Yes

☐ No

✓ **Correct**

Exactly! This property increases the network's capacity retaining a high performance as a result.

