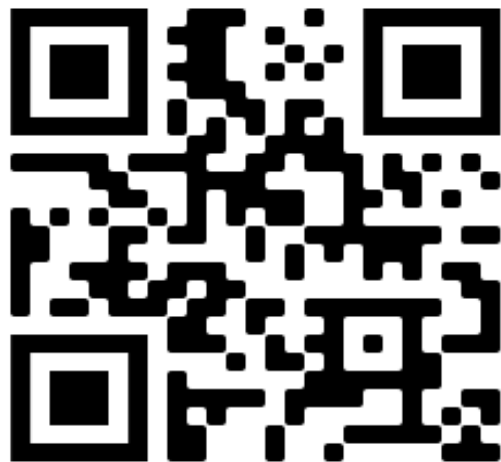# AWS and Machine Learning

By Peang Ratana, founder of STEM Club Cambodia
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SCAN HERE

- Peang Ratana completed a Master Degree in Science in Mathematics from Royal University of Phnom Penh & CIMPA. After completing Master's degree in Cambodia, I taught at many Universities and Institute in Cambodia. Here, I also attended Summer School at NIMS, Daejeon, South Korea about "Symplectic Embeddings systolic inequalities and celestial mechanics". Attended ASEAN Science Assembly Diplomats held at Davao City ,Philippine, and attended Common Purpose ASEAN Young Leaders Program at Singapore Institute of Technology, Singapore. In 2019 I published my research paper on STEM Education at Royal University of Agriculture, 2021 publish my research paper on Learning in Digital Era at TCI/MOC Asia Conference at CamEd Business School. In 2022, presentation NLP at Cambodia ICT Camp 2022 in Siem Reap. In 2023, be presenter about NLP and Digital literacy at ERaGet2023 , Institute of Technology Cambodia.
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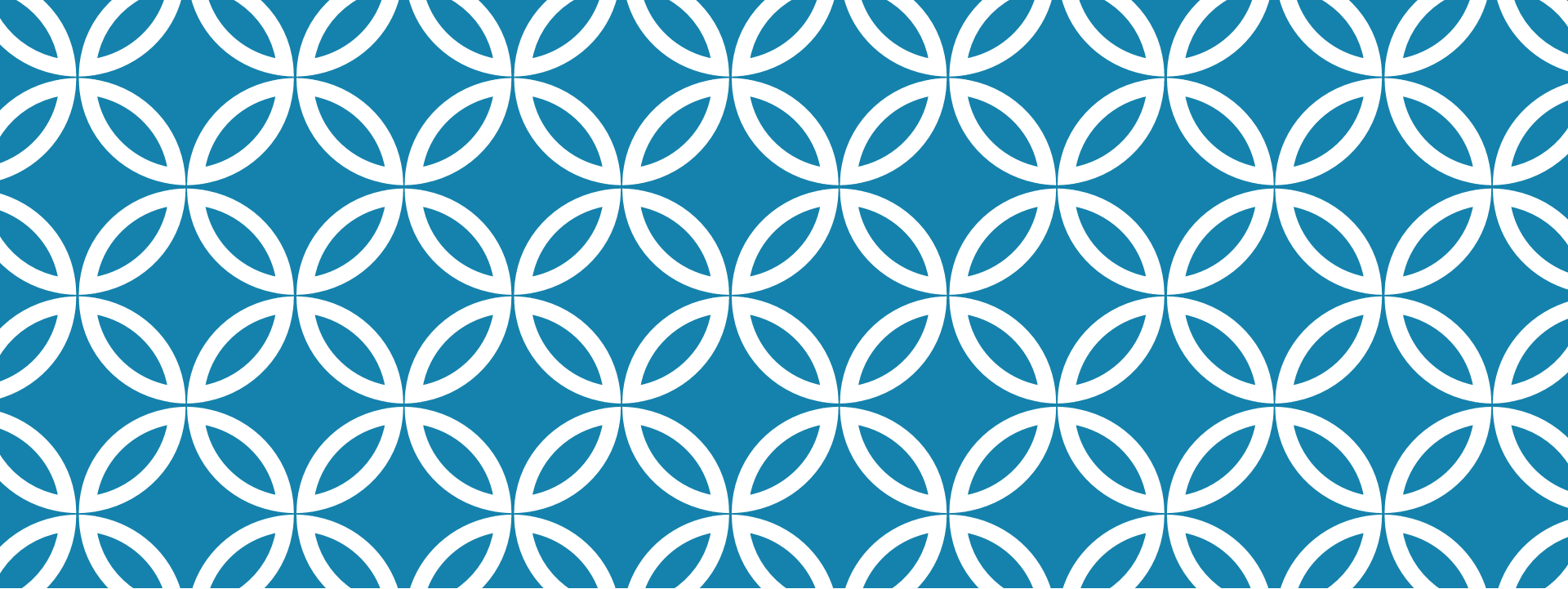
AWS

Amazon Web Services

Machine Learning with AWS is the right place to start if you are a beginner interested in learning useful artificial intelligence (AI) and machine learning skills using Amazon Web Services (AWS), the most popular and powerful cloud platform. You will learn how to use AWS to transform your projects into apps that work at high speed and are highly scalable. From natural language processing (NLP) applications, such as language translation and understanding news articles and other text sources, to creating chatbots with both voice and text interfaces, you will learn all that there is to know about using AWS to your advantage. You will also understand how to process huge numbers of images fast and create machine learning models.

Amazon SageMaker is a fully managed machine learning service. With Amazon SageMaker, data scientists and developers can quickly build and train machine learning models, and then deploy them into a production-ready hosted environment.

Console Home Info

Reset to default layout   **+ Add widgets**

⠿ **Recently visited** Info   ⋮

No recently visited services

Explore one of these commonly visited AWS services.

IAM   EC2   S3   RDS   Lambda

View all services

Customer Enablement

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Machine Learning

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☆ Console Home

What is Machine Learning?

Getting Started

Amazon SageMaker provides machine learning (ML) capabilities that are purpose-built for data scientists and developers to prepare, build, train, and deploy high-quality ML models efficiently.
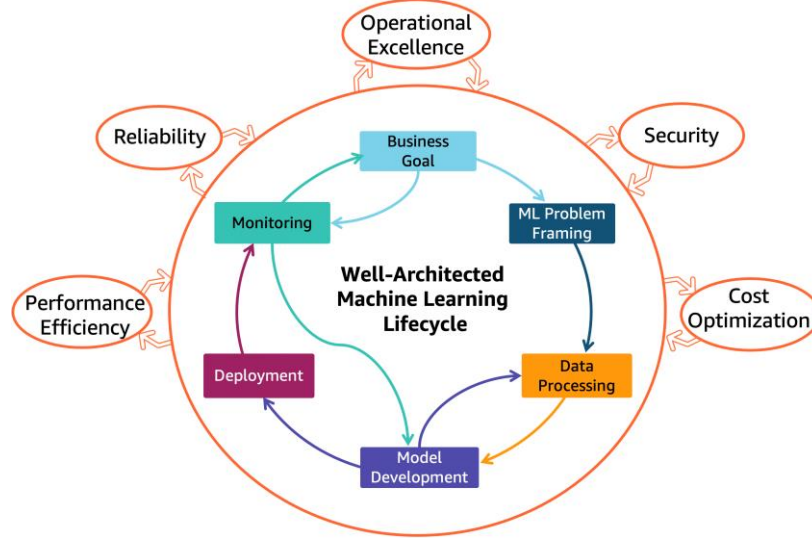
Configure role

Establish roles and quickly configure permission policies for your users.

Create a role

Configure SageMaker Domain

- Machine Learning is the study of computer algorithms that improves automatically through experience and by the use of data. (Wikipedia)
- The goal of ML is to program computers to use example data or past experience to solve a given problem.
- ML is a subset of Artificial Intelligence (AI). AI suggest that machines can mimic humans in talking, thinking, learning, planning, understanding.

ARTIFICIAL INTELLIGENCE (AI)

Studying AI raises many interesting questions:

- Can computers think like humans?
- Can computers be smarter than humans?
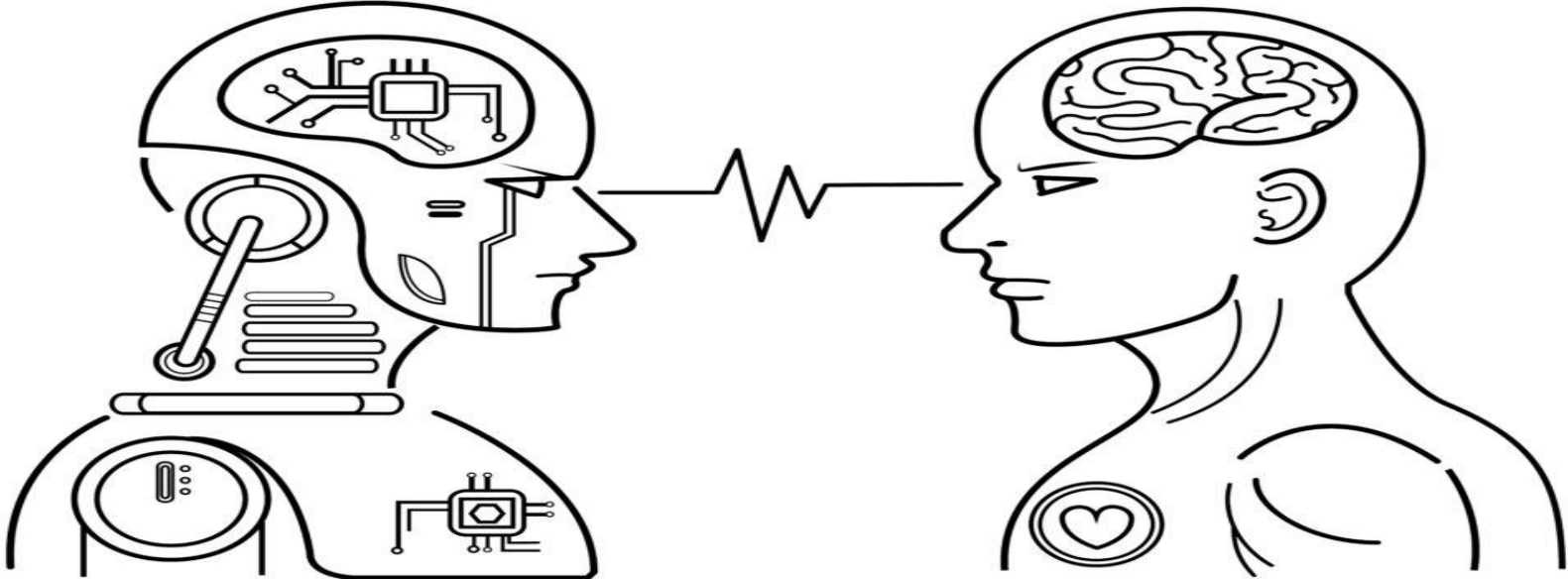- Can computers take over the world?

Machines can understand verbal commands, recognize faces, drive cars, and play games better than us.

- How long will it take before they walk among us?

HUMAN INTELLIGENCE

HUMAN VS ARTIFICIAL INTELLIGENCE: LANGUAGE

- Human languages contain a limited set of words put together in Sentences:

  E.g: I'm going on holiday in my new car.

- Computer languages are programmed with a limited set of words put together in computer Statements.

  E.g: points = [1,4,8,2]

About 70000 years ago, something happened to the human brain.

Humans started to develop "Cognitive Intelligence":

- Being able to understand a language
- Being able to understand numbers
- Being able to understand abstract thinking

The challenge of AI is to understand what intelligence is, and how intelligence works.

- What is the difference between human knowledge and artificial intelligence?

INTELLIGENCE NEEDS DATA

- Human Intelligence needs data:

  A real estate company needs data about land to estimate prices.

- Artificial intelligence needs data:

  A computer program also needs data to estimate prices.

WHAT IS DATA?

Data can be many things.

Position	Personality
Ideas	Intellect
Communicate	Connect
Invest	Reward

DATA COLLECTION

- Collecting data is the most important part of any ML projects..
- The most common data to collect are numbers and measurements.
- Often data are stored in arrays representing the relationship between values
- This table contains house prices vs size:

EXAMPLE OF MACHINE LEARNING

APPLICATION OF ML

- Self driving cars
- Face detection
- Robots
- Apple Siri
- Amazon Alexa
- Make recommendation on E-commerce websites
- Text Autocorrect
- Automated Translation
- Flying Drones , etc...

GIVE EXAMPLE OF WHAT MACHINE LEARNING CAN DO

Scan here:

Use this code: **1302589**

APPROACHES

Machine Learning approaches are traditionally divided into three broad categories:

- Supervised learning
- Unsupervised learning
- Reinforcement learning

SUPERVISED LEARNING

- Supervised learning uses labeled data (data with known answers) to train algorithms to: classify data, predict outcomes.
- Supervised learning can classify data like "what is spam in an e-mail", based on known spam examples.
- Supervised learning can predict outcomes like predicting what kind of video you like, based on videos you have played.

SUPERVISED LEARNING MODELS

- Decision Tree
- Linear Regression
- Logistic Regression
- Support Vector machines
- Bayesian learning
- K-nearest neighbor

UNSUPERVISED LEARNING

Unsupervised learning is used to predict undefined relationships like meaningful patterns in data. E.g grouping customers by purchasing behavior.

Unsupervise: all data is unlabeled and the algorithms learn to inherent structure from the input data.

Some popular examples of unsupervised learning algorithms are:

K-means for clustering problems.

REINFORCEMENT LEARNING

In this approach, an AI is given a goal, and in response to a range of inputs,learns through trial and error what to do to reach that goal.

Eg. Train AI to do as assistant in restaurant.

scientists and

Amazon SageMaker ✕

Getting started

Control panel

    Studio

    Studio Lab ⬈ NEW

    Canvas NEW

    RStudio NEW

SageMaker dashboard

    Images

    Search

▸ Ground Truth

▸ Notebook

▼ How it works

Amazon A2I provides built-in human review workflows for common machine learning use cases, such as content moderation and text extraction from documents, which enables you to review predictions from Amazon Rekognition and Amazon Textract. You can also create your own human review workflows for ML models built using Amazon SageMaker or other tools. Learn more ⬈

Step 1: Create human review workflow

You can use a human review workflow, or flow definition, to configure the conditions that trigger a human review (such as confidence thresholds or random sampling), specify the worker task UI, and choose your workforce. After this step you will have a

Step 2: Create and start a human loop

A human loop starts your human review workflow and sends data review tasks to human workers. To start a human loop, copy the workflow ARN value and use it as the FlowDefinitionArn in your API call when you create a human loop. Learn more ⬈

Amazon SageMaker ✕

Getting started

Control panel

   Studio

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SageMaker dashboard

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▶ **Ground Truth**

▶ **Notebook**

Create human review workflow

Configure your human workforce and provide information about how to accomplish the review task. For built-in task types, you also use the human review workflow to identify the conditions under which a human loop is triggered. To learn more, see Create a Flow Definition 🔗

Workflow settings

Name

[   ]

The name must be lowercase, unique within the Region in your account, and can have up to 63 characters. Valid characters: a-z, 0-9, and - (hyphen)

S3 bucket

Enter the path to the Amazon S3 bucket where you want to store the output of the human review. **Open Amazon S3 console** 🔗

[*s3://bucket name/folder name*   ]

The path must have the following format: s3://bucket name/folder name.

IAM role

This IAM role is used to grant Augmented AI permission to call other services on your behalf. If you want to use this role to start and manage human loops using Augmented AI Runtime, Amazon Rekognition or Amazon Textract API operations, you can attach the AmazonAugmentedAIIntegratedAPIAccess policy to the role in the **IAM console** 🔗 **Learn more** 🔗

THANK FOR YOUR ATTENTION !