

# Cloud Computing Amazon SageMaker

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# AWS SageMaker

## Components in Amazon SageMaker:

- SageMaker consists of two primary components:
  - **Model Training:** This is the process where the machine learning model learns from the training data.
  - **Model Deployment:** Once the model is trained, it can be deployed to make predictions or inferences.

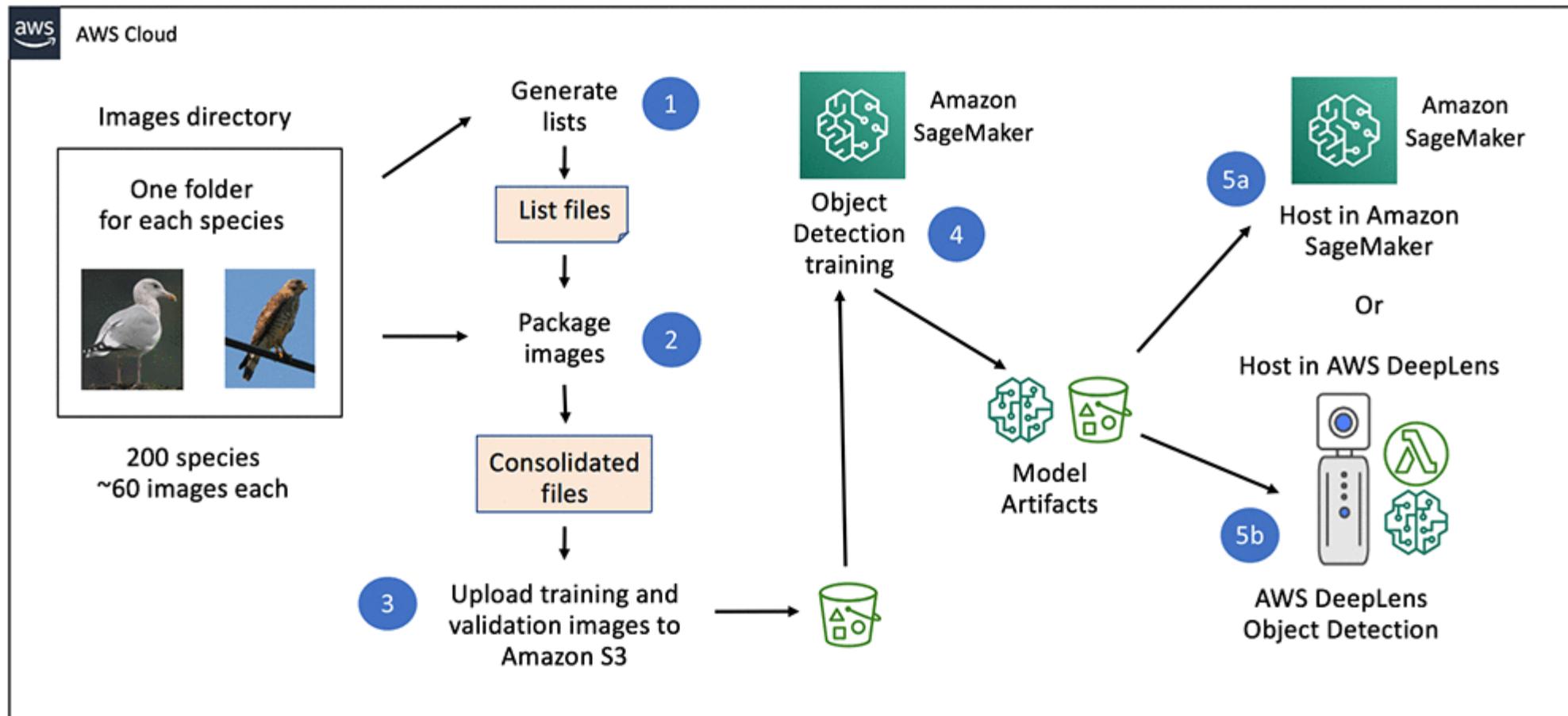
## Process of Training a Model in SageMaker:

- To initiate the training of an AI/ML model using SageMaker, the following steps are involved:
  - **Amazon S3 Bucket URL (Training Data):** You need to specify the location of your training data, which is stored in an Amazon S3 bucket, a scalable cloud storage service.
  - **Compute Resources:** SageMaker requires you to configure compute resources. It uses instances managed by SageMaker itself to train the model.
  - **Amazon S3 Bucket URL (Output):** The output from the training process, such as the trained model artifacts, will be stored in a specified S3 bucket.
  - **Amazon Elastic Container Registry Path:** This is where your training code is stored. The code is containerized, which means it is packaged with all its dependencies to run.

## Usage and Storage of Model Artifacts:

- SageMaker uses the training code and the dataset stored in S3 to train the model.
- Once the model is trained, SageMaker saves the resulting model artifacts in an S3 bucket. These artifacts include the model weights, structure, and any other files required to deploy the model.

# AWS SageMaker



[Source](#)

# AWS SageMaker Training Options

## Use an Algorithm Provided by Amazon SageMaker:

- SageMaker offers a selection of built-in algorithms that are ready to use "off the shelf". These algorithms include but are not limited to the Linear Learner, XGBoost, K Means, Principal Component Analysis (PCA), image classification, Latent Dirichlet Allocation (LDA), and the Sequence to Sequence Algorithm. These are optimized for performance and scalability on AWS infrastructure.

## Custom Code Training Using Popular Deep Learning Frameworks:

- Users have the option to write custom Python code using frameworks such as TensorFlow or Apache MXNet for model training. This allows for greater flexibility in model design and the ability to incorporate custom algorithms or specialized machine learning techniques.

## Use Your Own Custom Algorithms:

- For those who have proprietary algorithms or need to use algorithms that are not available in SageMaker, there is the option to containerize this code using Docker. The Docker container can then be registered with SageMaker, and the custom algorithm can be called using the SageMaker CreateTrainingJob API.

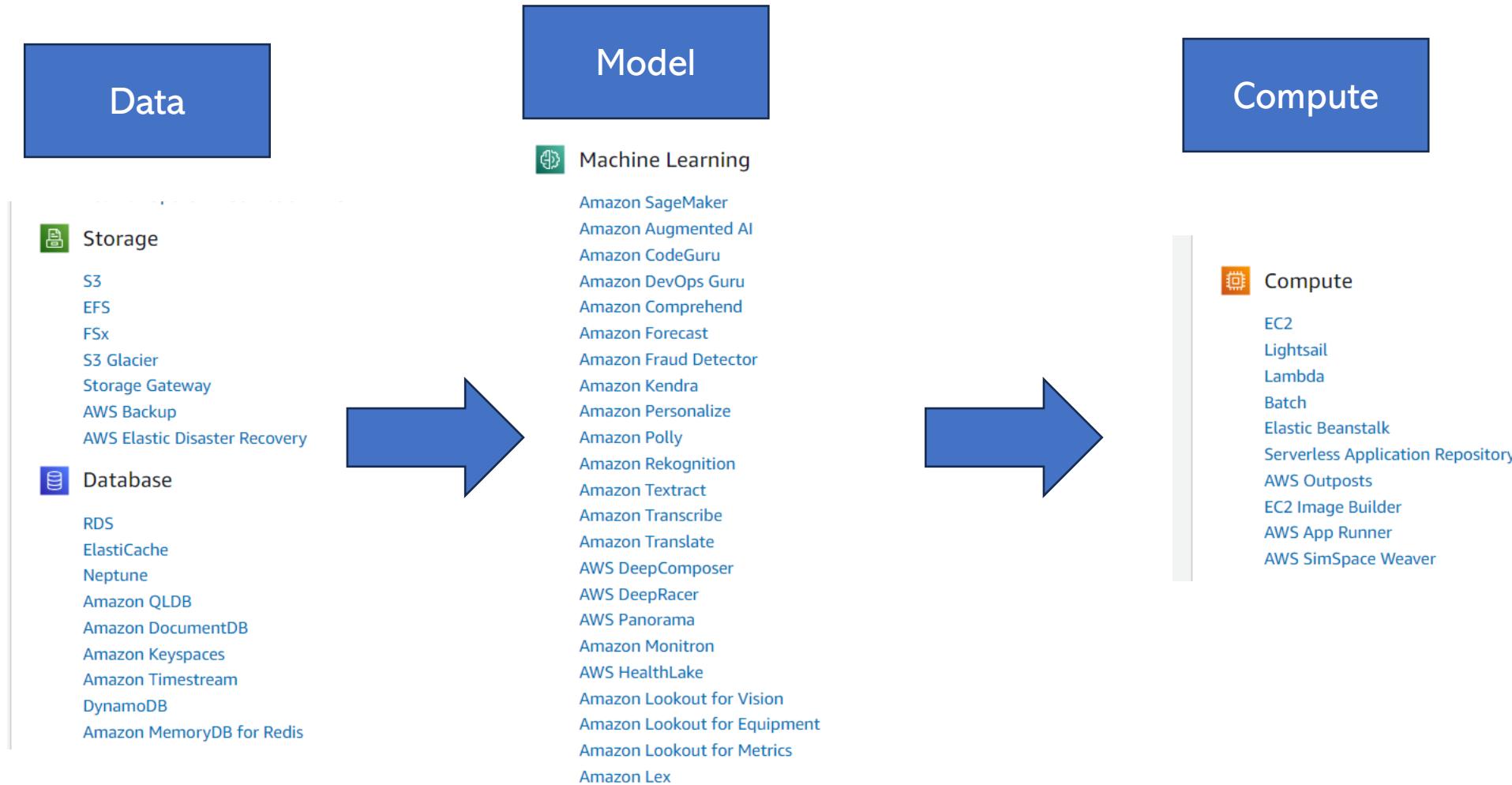
## AWS Marketplace:

- Amazon also provides the AWS Marketplace for machine learning, where users can choose from a wide array of algorithms and models that have been developed by third-party providers. These algorithms can be directly deployed in SageMaker.

## Use Apache Spark with Amazon SageMaker:

- For data scientists and developers who are familiar with Apache Spark, SageMaker offers the capability to utilize Spark in the cloud for distributed data processing and model training. This can be particularly useful for training models on large datasets.

# AWS SageMaker



# AWS SageMaker

## 1. Navigate to Amazon SageMaker:

- Once signed in, locate the "Services" menu at the top of the console, and search for "SageMaker". Selecting Amazon SageMaker directs to the service dashboard, a central place for managing all SageMaker resources.

## 2. Create Notebook Instance:

- In the SageMaker dashboard, find the "Notebook instances" section under the "Notebook" category. Click on the "Create notebook instance" button. This step initiates the process of setting up a new environment for Jupyter notebooks.

## 3. Configure Notebook Settings:

- Notebook instance name:** Assign a unique name to the notebook instance. This name is used to identify the notebook instance within the SageMaker environment.
- Instance type:** For a free tier account, select an eligible free tier instance type, such as **ml.t2.medium**. This choice is crucial for staying within the free tier limits.
- IAM role:** Choose or create an IAM role that SageMaker can assume to access AWS resources. If creating a new role, ensure it has necessary permissions to access S3 buckets or other resources as needed for notebook operations.

## 4. (Optional) Configure Additional Settings:

- Additional settings like VPC, encryption, or lifecycle configurations can be adjusted based on specific requirements. For most basic use cases, especially under the free tier, default settings suffice.

## 5. Create the Notebook Instance:

- After configuring the settings, click on the "Create notebook instance" button at the bottom of the page. This action triggers the provisioning of resources and setup of the notebook instance. It may take a few minutes for the notebook instance to be in the "InService" status, indicating it is ready to use.

## 6. Access the Notebook:

- Once the notebook instance status is "InService", click on the "Open Jupyter" or "Open JupyterLab" link to access the notebook environment. From here, Jupyter notebooks can be created and used for developing and running code.

# AWS SageMaker

The screenshot shows the AWS SageMaker dashboard. The top navigation bar includes the AWS logo, a services menu, a search bar, and account information for 'N. Virginia' and 'Farid\_winter20'. The left sidebar contains links for the SageMaker dashboard, search, JumpStart (Foundation models, Computer vision models, Natural language processing models), Governance, HyperPod Clusters, Ground Truth, Notebook, Processing, Training, and Inference. The main content area features a 'MACHINE LEARNING' heading, the 'Amazon SageMaker' logo, and the tagline 'Build, train, and deploy machine learning models at scale'. Below this, a sub-tagline reads 'The quickest and easiest way to get ML models from idea to production.' To the right, a 'New to SageMaker?' section offers two setup options: 'Set up for single user' (quick setup for a single user) and 'Set up for organizations' (advanced setup for organizations). A 'Documentation' link is also present.

SageMaker dashboard

Search

JumpStart

- Foundation models
- Computer vision models
- Natural language processing models

Governance

HyperPod Clusters

Ground Truth

Notebook

Processing

Training

Inference

MACHINE LEARNING

# Amazon SageMaker

## Build, train, and deploy machine learning models at scale

The quickest and easiest way to get ML models from idea to production.

New to SageMaker?

Quick setup for a single user i

This is perfect for first time users to try capabilities in just a few clicks.

**Set up for single user**

Advanced setup for organizations

Customize capabilities, permissions, network, and more for your team to launch Studio.

**Set up for organizations**

**Documentation**

# AWS SageMaker

- Labeling jobs in the context of machine learning and Amazon SageMaker are processes aimed at assigning labels to datasets.
- These labels are crucial for training supervised learning models, where the model learns to predict the label given the features of an input. In SageMaker, labeling jobs facilitate the annotation of data with labels that categorize or identify certain characteristics or outcomes within the data.
- **Understanding Labeling Jobs**
  - **Purpose:** The primary purpose of a labeling job is to create accurately labeled datasets for training machine learning models. This can involve categorizing images, tagging text, identifying objects within images, or any other form of data annotation relevant to the machine learning task.
  - **Process:** A labeling job typically involves human annotators who review the dataset and apply labels according to a predefined set of instructions or criteria. Amazon SageMaker supports automated mechanisms as well, such as using machine learning models to pre-label the data, which human annotators can then review and correct if necessary.

# AWS SageMaker

- **Features of Labeling Jobs in Amazon SageMaker**

1. **Ground Truth:** Amazon SageMaker Ground Truth is a feature that helps in building highly accurate training datasets for machine learning quickly. Ground Truth offers easy access to human labelers through Amazon Mechanical Turk, third-party vendors, or your own private workforce.
2. **Automation and Augmentation:** Ground Truth uses active learning to understand the labeling decisions and can automatically apply labels to much of the dataset, reducing the need for human intervention and speeding up the labeling process.
3. **Labeling Workflows:** SageMaker Ground Truth supports various types of labeling tasks, including image classification, text classification, object detection, and semantic segmentation, among others.
4. **Managed Workforces:** Ground Truth allows you to create and manage private workforces or use pre-integrated workforces. This feature simplifies the process of managing the human labor involved in the labeling task.
5. **Quality Control:** Built-in workflows help maintain high-quality labels through automatic consensus mechanisms and auditing capabilities, ensuring that the labels are accurate and reliable.
6. **Integration and Scalability:** SageMaker's labeling jobs are integrated with the rest of the SageMaker platform, allowing seamless transition from data labeling to model training and deployment. It is designed to scale with your project, capable of handling large datasets efficiently.
7. **Cost-Effectiveness:** By combining automated labeling with human oversight, Ground Truth optimizes the cost of labeling without compromising on quality. For users on the free tier, there may be certain limitations and costs associated with accessing human annotators or using extensive computational resources.

# AWS SageMaker

The screenshot shows the AWS SageMaker console. The left sidebar has a dark theme with the following navigation items:

- RStudio
- SageMaker dashboard
- Images
- Lifecycle configurations
- Search
- Ground Truth
  - Labeling jobs** (selected)
  - Labeling datasets
  - Labeling workforces
  - Plus **New**
  - Synthetic data **New**
- Notebook
- Processing
- Training
- Inference
- Edge Manager
- Augmented AI

The main content area is titled "Labeling jobs" and shows the following details:

- Header: "Labeling jobs" with an "Info" link, a search bar, and buttons for "Actions" and "Create labeling job".
- Table Headers: Name, Status, Task type, Labeled objects/total, Creation time.
- Message: "No labeling jobs" and "No labeling jobs associated with this resource."
- Button: "Create labeling jobs".

# AWS SageMaker

AWS Services Search [Alt+S] N. Virginia ▾ Farid\_winter2024 ▾

Task category  
Select the type of data being labeled to view available task templates for it or select 'Custom' to create your own.

Image

Task selection  
Select the task that a human worker will perform to label objects in your dataset.

Image Classification (Single Label)  
Get workers to categorize images into individual classes. [Info](#)

Basketball  
 Soccer



Image Classification (Multi-label)  
Get workers to categorize images into one or more classes. [Info](#)

Human  
 Vehicle  
 Animal



Bounding box  
Get workers to draw bounding boxes around specified objects in your images. [Info](#)



Semantic segmentation  
Get workers to draw pixel level labels around specific objects and segments in your images. [Info](#)



Label verification  
Get workers to verify existing labels in your dataset. [Info](#)

# AWS SageMaker- Training Job

Servicess Search [Alt+S]

you created the training job. [Learn more](#)

### Job settings

Job name: Tabular - XGBoost : v1.3

Maximize accuracy in an Amazon SageMaker endpoint.

IAM role: Tabular - Factorization Machines

Amazon SageMaker has the following IAM roles:

- Tabular - Object2Vec
- Vision - Image Classification (MxNet)
- Vision - Object Detection (MxNet)
- Vision - Semantic Segmentation (MxNet)

Algorithm: Clustering - K-Means

Use an algorithm from the following list:

- Time Series Forecast - DeepAR
- Text Classification & Text Embedding - Blazing Text
- Text Transformation - Sequence to Sequence (MxNet)
- Text Topic Modeling - Neural Topic Modeling (NTM)
- Text Topic Modeling - Latent Dirichlet Allocation (LDA)
- Dimensionality Reduction - Principal Component Analysis (PCA)

Anomaly Detection: Anomaly Detection - Random Cut Forest

Anomaly Detection - IP Insights

Choose an algorithm or custom training image...

Enable SageMaker metrics time series

### Resource configuration

Instance type	Instance count	Additional storage volume per instance (GB)
ml.m4.xlarge	1	1

# AWS SageMaker- Training Jobs

- **Model Training:** The core purpose of a training job is to apply a specific algorithm to a dataset, adjusting the model's parameters to minimize error and improve prediction accuracy. This process is automated within SageMaker, which manages the computational resources required for the training.
- **Data Input:** Training jobs start by specifying the location of input data, usually stored in Amazon S3. This data is then fed into the training algorithm. SageMaker supports various data formats and sources, allowing flexibility in how data is ingested.
- **Compute Resources:** SageMaker dynamically allocates the necessary compute resources for the training job. Users can specify the type and quantity of instances required for the training, and SageMaker handles the provisioning and scaling of these resources.
- **Algorithm Selection:** Users can choose from a wide range of built-in algorithms provided by SageMaker or upload their own custom algorithms. These algorithms are optimized for scalable, efficient training on the cloud.
- **Hyperparameters:** Before starting a training job, users define hyperparameters that control the training process, such as learning rate and batch size. SageMaker also offers hyperparameter tuning jobs to automatically find the optimal hyperparameters for a model.
- **Model Artifacts:** Upon completion of a training job, SageMaker outputs model artifacts – files containing the trained model's data. These artifacts are stored in S3 and can be used to deploy the model in a production environment or for further evaluation.
- **Integration and Automation:** Training jobs in SageMaker can be integrated with other SageMaker features and AWS services for a seamless ML workflow, including data preprocessing with SageMaker Processing, model evaluation, and deployment using SageMaker Endpoints.
- **Security and Compliance:** SageMaker provides built-in security features to protect training jobs, including data encryption and access control. Compliance with industry standards ensures that training jobs meet regulatory requirements.

# AWS SageMaker- Endpoints

The screenshot shows the 'Create and configure endpoint' page in the AWS SageMaker console. The top navigation bar includes the AWS logo, a services menu, a search bar, and account information for 'N. Virginia' and 'Farid\_winter2024'. The main content area has a breadcrumb trail: 'Amazon SageMaker > Endpoints > Create and configure endpoint'. The title 'Create and configure endpoint' is displayed. Below it, a note states: 'To deploy models to Amazon SageMaker, first create an endpoint. Provide an endpoint configuration to specify which models to deploy and the hardware requirements for each. See [Deploying a Model on Amazon SageMaker Hosting Services](#) [?]

[Learn more about the API](#) [?]

**Endpoint**

**Endpoint name**  
Your application uses this name to access this endpoint.  
[Input field]  
Maximum of 63 alphanumeric characters. Can include hyphens (-), but not spaces. Must be unique within your account in an AWS Region.

**Attach endpoint configuration**

Use an existing endpoint configuration  
Use an existing endpoint configuration or clone an endpoint configuration.

Create a new endpoint configuration  
Add models and configure the instance and initial weight for each model.

**Endpoint configuration**

Search resources [Input field] C  
< 1 >  
Name ARN Creation time  
There are currently no resources.  
Select endpoint configuration

# AWS SageMaker- Endpoints

- **Deployment:** Endpoints facilitate the deployment of models into a production-ready, hosted environment. This allows for real-time or batch predictions.
- **Real-time Inference:** They provide an HTTP(S) API for real-time inference, enabling applications to get predictions from the deployed model by sending data to the endpoint.
- **Scalability:** SageMaker Endpoints are scalable, automatically adjusting the underlying infrastructure to match the volume of inference requests. This ensures consistent performance even under varying loads.
- **High Availability:** They are designed for high availability, with models deployed across multiple availability zones to ensure continuous operation.
- **Security:** Endpoints are secured with encryption and access control. Data transmitted to and from the endpoints can be encrypted in transit, and access is controlled using AWS Identity and Access Management (IAM) policies.
- **Integration:** SageMaker Endpoints can be easily integrated with other AWS services, providing a seamless environment for deploying and managing machine learning applications.
- **Monitoring and Logging:** They offer monitoring and logging capabilities, allowing users to track the performance of the model, monitor the number of requests, and log the input and output data for troubleshooting.
- **Update and A/B Testing:** Endpoints support updating deployed models without downtime. They also support A/B testing to compare different models or model versions under real-world conditions.
- **Cost:** The cost of using SageMaker Endpoints depends on the resources consumed, including the instance type and the amount of data processed. Users are charged for the duration that the endpoint is running, making it cost-effective for continuous inference needs.

# AWS SageMaker- Augmented AI

AWS Services Search [Alt+S] N. Virginia Farid\_winter2024

Amazon SageMaker X

Getting started

Control panel

Studio

Studio Lab

Canvas

RStudio

SageMaker dashboard

Images

Lifecycle configurations

Search

▶ Ground Truth

▶ Notebook

▶ Processing

▶ Training

▶ Inference

▶ Edge Manager

▶ Augmented AI

▶ AWS Marketplace

Amazon SageMaker > Human review workflows

▼ 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 workflow ARN to be used in Step 2. [Learn more](#)



**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](#)

**Human review workflows (0)**

Create human review workflow

< 1 >

Name	Workflow ARN	Status	Created
There are currently no human review workflows.			

Create human review workflow

# AWS SageMaker- Augmented AI

- **Human-in-the-loop (HITL) Workflow:** A2I integrates human judgment into the machine learning workflow, allowing for manual review and correction of model predictions. This is particularly useful for tasks where human intuition is necessary for validating or improving model outputs.
- **Easy Integration:** It seamlessly integrates with various AWS machine learning services like Amazon Rekognition, Amazon Textract, and Amazon SageMaker, as well as custom machine learning models built on SageMaker. This makes it versatile for a wide range of applications.
- **Customizable Workflows:** Users can create or customize human review workflows, defining when and how predictions are sent for human review based on specific conditions or confidence thresholds set by the user.
- **Managed Human Review Workforce:** A2I provides access to Amazon Mechanical Turk as a workforce for reviewing predictions. Alternatively, users can create their own private workforce or use third-party vendors for the review process.
- **Quality Control:** Offers tools for managing the quality of human reviews, including the ability to audit review outcomes and provide feedback to reviewers to ensure high-quality annotations.
- **Security and Compliance:** Ensures secure data handling and compliance with data privacy regulations, making it suitable for sensitive or regulated industries.
- **Cost-Effective:** By leveraging human reviewers only when necessary (based on model confidence scores or specific conditions), A2I helps optimize the costs associated with human review while maximizing the overall accuracy and reliability of machine learning predictions.
- **Scalability:** The service is designed to scale with the needs of the application, capable of handling large volumes of review tasks as needed.
- **Use Cases:** Ideal for complex or subjective tasks where machine learning models may not achieve perfect accuracy on their own, such as content moderation, text extraction from documents, or image and video analysis.

# Create our first project in Jupyter Notebook

- **Step 1: Access Your Notebook Instance**

1. Log in to the AWS Management Console.
2. Navigate to the Amazon SageMaker service.
3. Under the "Notebook" section in the SageMaker dashboard, click on "Notebook instances".
4. Find the notebook instance you've created and click on the "Open JupyterLab" link next to it.  
This action opens the JupyterLab interface of your SageMaker notebook instance.

- **Step 2: Explore the JupyterLab Interface**

- **File Browser:** On the left side, you'll see the file browser where you can manage your notebook files and directories.
- **Launcher:** The launcher tab allows you to create new notebooks, text files, and other items. It's typically the first tab you see when you open JupyterLab.
- **Running:** This tab shows all currently running notebooks and terminals, allowing you to manage them easily.

# Create our first project in Jupyter Notebook

- **Step 3: Create a New Notebook with a Conda Python 3 Environment**
  1. **Open the Launcher:** If you're not already on the launcher page, click on the "+" icon on the file browser's side panel to open it.
  2. **Select Your Kernel:** Look for the "Notebook" section in the launcher. Here, you'll see options for different types of notebooks based on the available kernel environments. Select the one that mentions "Conda\_python3" or a similar name indicating a Python 3 environment managed by Conda.
  3. **Name Your Notebook:** After the notebook opens, you can rename it by right-clicking on the tab with the notebook's name and selecting "Rename" or by clicking on the notebook name at the top of the notebook itself.
- **Step 4: Explore the Notebook Interface**
  - **Cells:** Notebooks are made up of cells. You can type Python code directly into a cell and run it by pressing "Shift + Enter" or by clicking the run button in the toolbar.
  - **Add Cells:** You can add new cells for code or markdown text using the "+" button on the toolbar.
  - **Kernel Actions:** You can manage your notebook's kernel (i.e., the Python environment) using the kernel menu. This includes restarting the kernel or changing the kernel if needed.
- **Step 5: Save and Manage Your Work**
  - **Save:** You can save your notebook at any time by clicking the save icon on the toolbar or by selecting "File" > "Save" from the menu.
  - **Export:** If you want to download your notebook to your local machine, you can select "File" > "Export Notebook As" and choose the desired format.

# AWS SageMaker- Market Place

SageMaker Market Place

Search [Alt+S]

JumpStart

- Foundation models
- Computer vision models
- Natural language processing models

Governance

HyperPod Clusters

Ground Truth

Notebook

Processing

Training

Inference

Edge Manager

Augmented AI

AWS Marketplace

Model packages

- Algorithms
- AWS Data Exchange
- All products

Tutorials

Documentation

Amazon SageMaker > AWS Marketplace

### Search AWS Marketplace

Search

Need help creating a custom machine learning solution? Connect with an AWS IQ expert to train a custom model in Amazon SageMaker.

#### Featured model packages See all products

 Face and License Plate Anonymizer  
By NavInfo Europe B.V. | Ver 4.0.0  
 View product

 GluonCV YOLOv3 Object Detector  
By Amazon Web Services | Ver 1.1  
 2 View product

 Passport Data Page Detection  
By Gtrilp | Ver 1.0.1  
 View product

 Mphasis DeepInsights Text Summarizer  
By Mphasis | Ver 3.2  
Mphasis DeepInsights Text Summarizer helps in summarizing text documents.  


 Vehicle Damage Inspection  
By Persistent Systems | Ver 0.1  
Classifies vehicle damage images in multiple types  


 PPE Detector for Worker Safety  
By VITECH Lab | Ver 3.0  
 View product



# AWS SageMaker- Market Place

aws marketplace

Search

Hello, Farid\_winter2024 ▾

About ▾ Categories ▾ Delivery Methods ▾ Solutions ▾ AWS IQ ▾ Resources ▾ Your Saved List

Become a Channel Partner Sell in AWS Marketplace Amazon Web Services Home Help

Upload an image

Do not upload any confidential or sensitive information. Use of this feature is for demonstration purposes only and is in a public environment.



Object details

Label: chair

- Confidence: 21.52%

# Marketplace

- **Step 2: Find the YOLOv3 Object Detection Model**

1. Use the **search bar** in AWS Marketplace to search for "YOLOv3 Object Detection" or a similar term.
2. Look for listings that mention "**Product Demo**" availability. Not all listings will offer a demo, but those that do will usually highlight this option.

- **Step 3: Review the Model Listing**

1. **Select a model** that interests you by clicking on its listing.
2. **Read the description** carefully, focusing on features, requirements, and the availability of a demo. This section should give you an overview of what the model can do and how it can be deployed.

- **Step 4: Accessing the Demo**

1. If a demo is available, there should be a "**View product demo**" button or link on the model's AWS Marketplace page.
2. Follow the provided link or instructions to access the demo. This might redirect you to an external website, a Jupyter notebook, or an AWS SageMaker instance pre-configured with the model.

- **Step 5: Using the Demo**

1. The demo environment should provide you with instructions on how to upload an image or use pre-loaded images for object detection.
2. Follow these instructions to **test the YOLOv3 model**. This could involve simply clicking a "Detect objects" button or executing a specific command in a notebook.

- **Step 6: Evaluating the Results**

1. After running the detection, **review the output** provided by the demo. This typically includes the image with bounding boxes drawn around detected objects and may include labels and confidence scores.
2. Use this opportunity to evaluate the model's performance and suitability for your needs.

# AWS SageMaker Studio

- AWS SageMaker Studio is an integrated development environment (IDE) for machine learning (ML) provided by Amazon Web Services (AWS).
- It offers a comprehensive and unified web interface where data scientists, developers, and ML practitioners can perform all steps of the ML workflow more efficiently and collaboratively.
- SageMaker Studio simplifies the process of building, training, tuning, deploying, and managing ML models at scale. Here are the key features and benefits:

## • Unified ML Workflow

- **One-stop-shop:** SageMaker Studio provides a single, web-based visual interface where users can perform all ML development steps—from preparing data to deploying and monitoring models.
- **Collaboration:** It enhances collaboration among team members by enabling them to share notebooks, datasets, models, and workflows seamlessly.

## • Build and Prepare

- **Data Preparation:** It integrates with AWS Data Wrangler to simplify data preparation and exploration, making it easier to import, clean, transform, and visualize data from various sources.
- **Experiment Management:** SageMaker Studio tracks and manages machine learning experiments, allowing users to easily compare different models based on performance metrics.

# AWS SageMaker Studio

- **Train and Tune**

- **Automated Model Building:** With SageMaker Autopilot, users can automatically build, train, and tune the best ML models based on their dataset, with full visibility into the generated models.
  - **Distributed Training:** It supports distributed training strategies to speed up the training process of complex models over vast datasets.

- **Deploy and Manage**

- **Real-time and Batch Inference:** SageMaker Studio allows for the deployment of models for real-time or batch predictions with just a few clicks, handling all aspects of the deployment process, including scaling and monitoring.
  - **Model Monitoring:** It offers tools to monitor deployed models in production, detect data drift, and automatically retrain models as needed to maintain performance.

- **Integrated Jupyter Notebooks**

- **Interactive Jupyter Notebooks:** Users can create and share Jupyter notebooks within SageMaker Studio, leveraging pre-built images for various ML frameworks and libraries without managing servers.

- **Security and Access Control**

- **Security:** SageMaker Studio is built with AWS's robust security mechanisms, ensuring that data and ML models are protected with encryption, access controls, and compliance with industry standards.
  - **Fine-grained Access Control:** It integrates with AWS Identity and Access Management (IAM) to provide fine-grained access control to resources and operations within SageMaker Studio.

- **Scalability and Flexibility**

- **Scalable:** AWS SageMaker Studio scales automatically to accommodate the computational requirements of training and deploying ML models, from small datasets to large-scale enterprise applications.
  - **Flexible:** It supports a wide range of ML frameworks and tools, allowing developers and data scientists to use their preferred libraries and APIs.

# AWS SageMaker- Studio

The screenshot shows the AWS SageMaker Studio interface. The top navigation bar includes the AWS logo, Services, a search bar, and user information (N. Virginia, Farid\_winter2024). A banner at the top left announces the general availability of Sagemaker geospatial capability in us-west-2. The main content area features the Amazon SageMaker logo and the heading "SageMaker Studio: The first fully integrated development environment (IDE) for machine learning." To the right is a "Get Started" section with a button to "Create a SageMaker domain". Below this are sections for "How it works" (with a "What is Studio?" sub-section), "Pricing (US)", and "Features". The left sidebar contains a navigation menu with links to Getting started, Studio (selected), Studio Lab, Canvas, RStudio, TensorBoard, Profiler, Admin configurations (Domains, Role manager, Images, Lifecycle configurations), SageMaker dashboard, Search, JumpStart (Foundation models, Computer vision models, Natural language processing models), Governance, and HyperPod Clusters.

Sagemaker geospatial capability is now generally available in us-west-2

Amazon SageMaker geospatial capabilities make it easier for data scientists and machine learning (ML) engineers to build, train, and deploy ML models faster using geospatial data.

Learn more

Amazon SageMaker

## SageMaker Studio

The first fully integrated development environment (IDE) for machine learning.

### Get Started

Create an [Amazon SageMaker domain](#) to use Studio and Studio Notebooks.

[Create a SageMaker domain](#)

### How it works

#### What is Studio?

Amazon SageMaker Studio provides a single, web-based visual interface where you can perform all ML development steps, improving data science team productivity by up to 10x. SageMaker Studio gives you complete access, control, and visibility into each step required to build, train, and deploy models.

[Get Started with SageMaker](#)

### Pricing (US)

With Amazon SageMaker Studio, you pay only for what you use. Authoring, training and hosting is billed by the second, with no minimum fees and no upfront commitments.

[Learn more](#)

### Features

# AWS SageMaker- Studio

The screenshot shows the AWS SageMaker Studio interface. At the top, there's a banner announcing the general availability of Sagemaker geospatial capability in us-west-2. The main content area is titled "Set up SageMaker Domain" and provides instructions for managing configuration. It offers two setup options: "Set up for single user (Quick setup)" and "Set up for organizations". The "Set up for single user" section is highlighted with a blue border and contains a list of checked items: New IAM role with AmazonSageMakerFullAccess policy, Public internet access, and standard encryption, SageMaker Studio - New, and SageMaker Studio Classic integrations, Sharable SageMaker Studio Notebooks, SageMaker Canvas, and IAM Authentication. Below this, a note says "Perfect for single user domains and first time users looking to get started with SageMaker." A large orange "Set up" button is located at the bottom left of this section. The "Set up for organizations" section lists: Advanced network security, and data encryption, SageMaker Studio - New, SageMaker Studio Classic, RStudio, and Code Editor Based on Code-OSS, Visual Studio Code Open Source integrations, SageMaker Studio Projects, and Jumpstart, SageMaker Canvas, and Amazon services integrations, and IAM, or IAM Identity Center (successor to AWS SSO). A note below states "Better for admins with large user groups, but you can always update your account configuration settings later if you want to do a quick setup now." The left sidebar includes links for Getting started, Studio, Studio Lab, Canvas, RStudio, TensorBoard, Profiler, Admin configurations (Domains, Role manager, Images, Lifecycle configurations), SageMaker dashboard, Search, JumpStart (Foundation models, Computer vision models, Natural language processing models), Governance, and HyperPod Clusters.

Sagemaker geospatial capability is now generally available in us-west-2

Amazon SageMaker capabilities make it easier for data scientists and machine learning (ML) engineers to build, train, and deploy ML models faster using geospatial data.

Learn more

Amazon SageMaker > Set up SageMaker Domain

## Set up SageMaker Domain

Use SageMaker Domain as the central store to manage the configuration of SageMaker for your organization.

### Set up for single user (Quick setup)

Let Amazon SageMaker configure your account, and set up permissions for your SageMaker Domain.

- New IAM role with AmazonSageMakerFullAccess policy
- Public internet access, and standard encryption
- SageMaker Studio - New, and SageMaker Studio Classic integrations
- Sharable SageMaker Studio Notebooks
- SageMaker Canvas
- IAM Authentication

Perfect for single user domains and first time users looking to get started with SageMaker.

Set up

### Set up for organizations

Control all aspects of account configuration, including permissions, integrations, and encryption.

- Advanced network security, and data encryption
- SageMaker Studio - New, SageMaker Studio Classic, RStudio, and Code Editor Based on Code-OSS, Visual Studio Code Open Source integrations
- SageMaker Studio Projects, and Jumpstart
- SageMaker Canvas, and Amazon services integrations
- IAM, or IAM Identity Center (successor to AWS SSO)

Better for admins with large user groups, but you can always update your account configuration settings later if you want to do a quick setup now.

Services Search [Alt+S] N. Virginia Farid\_winter2024

Getting started Studio Studio Lab Canvas RStudio TensorBoard Profiler

Admin configurations Domains Role manager Images Lifecycle configurations

SageMaker dashboard Search

JumpStart Foundation models Computer vision models Natural language processing models

Governance

HyperPod Clusters

# AWS SageMaker- Studio

AWS Services Search [Alt+S] N. Virginia Farid\_winter2024

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240220T232800 > Add user profile

## Add user profile

Step 1 General settings

Step 2 Studio settings

Step 3 RStudio settings

Step 4 Canvas settings

### General settings

User profile and details.

#### User profile

Name: default-1708489771766

The name can have up to 63 characters. Valid characters: A-Z, a-z, 0-9, and - (hyphen)

Execution role: Please choose an execution role

**Internal Server Error (undefined)**  
Please contact AWS service team for further help.

Create role using the role creation wizard

#### Tags - optional

Add tag

You can attach up to 50 tags

# AWS SageMaker- Studio

Add user profile

Step 1 General settings

Step 2 Studio settings

Step 3 Studio settings

Step 4 Canvas settings

**User profile**

Name: default-1708489771766  
The name can have up to 63 characters.

Execution role: The default execution role for notebooks attached.  
[Create a new role](#) Required

[Create role using the role ARN](#)

**Tags - optional**

[Add tag](#)  
You can attach up to 50 tags

**Create an IAM role**

Passing an IAM role gives Amazon SageMaker permission to perform actions in other AWS services on your behalf. Creating a role here will grant permissions described by the [AmazonSageMakerFullAccess](#) IAM policy to the role you create.

The IAM role you create will provide access to:

S3 buckets you specify - *optional*

Any S3 bucket  
Allow users that have access to your notebook instance access to any bucket and its contents in your account.

Specific S3 buckets  
*Example: bucket-name-1, bucket-name-2, bu*  
Comma delimited. ARNs, "\*" and "/" are not supported.

None

Any S3 bucket with "sagemaker" in the name

Any S3 object with "sagemaker" in the name

Any S3 object with the tag "sagemaker" and value "true" [See Object tagging](#)

S3 bucket with a Bucket Policy allowing access to SageMaker [See S3 bucket policies](#)

[Cancel](#) [Create role](#)

Cancel

Next

# AWS SageMaker- Studio

AWS Services Search [Alt+S] N. Virginia Farid\_winter2024 X

Amazon SageMaker X

User profile was successfully created.

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240220T232800

## QuickSetupDomain-20240220T232800

### Domain details

Configure and manage the domain.

User profiles Space management Environment Domain settings

#### User profiles Info

A user profile represents a single user within a domain. It is the main way to reference a user for the purposes of sharing, reporting, and other user-oriented features.

Search users < 1 > Filter

Name	Modified on	Created on
default-1708490478592	Feb 21, 2024 04:41 UTC	Feb 21, 2024 04:41 UTC

Launch ▾

Getting started Studio Studio Lab Canvas RStudio TensorBoard Profiler

Admin configurations Domains Role manager Images Lifecycle configurations

SageMaker dashboard Search

JumpStart Foundation models Computer vision models Natural language processing models

Governance

HyperPod Clusters

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# AWS SageMaker- Studio

SageMaker Studio User profile was successfully created.

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240220T232800

## QuickSetupDomain-20240220T232800

### Domain details

Configure and manage the domain.

User profiles    Space management    Environment    Domain settings

#### User profiles

A user profile represents a single user within a domain. It is the main way to reference a user for the purposes of sharing, reporting, and other user-oriented features.

Name	Modified on	Created on
default-1708490478592	Feb 21, 2024 04:41 UTC	Feb 21, 2024 04:41 UTC

Launch ▲

Personal apps

- Studio
- Canvas
- TensorBoard
- Profiler

Collaborative

- Spaces

Getting started  
Studio  
Studio Lab  
Canvas  
RStudio  
TensorBoard  
Profiler

Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard  
Search

JumpStart

- Foundation models
- Computer vision models
- Natural language processing models

Governance

HyperPod Clusters

# AWS SageMaker- Studio

The screenshot shows the AWS SageMaker Studio interface. On the left, there's a sidebar with various navigation options: Applications (JupyterLab, RStudio, Canvas, Code Editor, Studio CLI), Home, Running instances, Data, Auto ML, Experiments, Jobs, Pipelines, Models, JumpStart, and Deployments. The main area is titled "Home" and contains sections for "Overview" and "Getting started". The "Overview" section features cards for "JupyterLab" (orange background, Jupyter logo), "Code Editor" (blue background, Python logo), "JumpStart" (blue gradient background, speaker icon), and "AutoML" (purple gradient background, funnel icon). Below these are sections for "Prebuilt and automated solutions" (JumpStart and AutoML) and "Workflows and Tasks" (Prepare data, Build, train, tune models, Deploy Model).

**Home**  
Launch workflows, manage your applications and spaces, and view getting started materials.

[Overview](#) [Getting started](#)

**Overview**  
Start a new ML workflow or jump back into your workflow

**JupyterLab**  
Create, manage, and run durable instances of JupyterLab using spaces.  
[View JupyterLab spaces >](#)

**Code Editor**  
Based on Code-OSS, Visual Studio Code Open Source  
Create, manage, and run durable instances of Code Editor using spaces.  
[View Code Editor spaces >](#)

**JumpStart**  
Quickly deploy, fine-tune, and evaluate pre-trained models.

**AutoML**  
Automatically build, train, and tune models.

## Workflows and Tasks

- Prepare data**
- Connect to data sources
  - Transform, analyze, and export data
  - Store, manage, and retrieve features
  - Manage EMR clusters

- Build, train, tune models**
- View all training jobs
  - Create an AutoML experiment
  - View all experiments
  - Tune pre-trained models
  - Catalog models with model registry

- Deploy Model**
- Get endpoint deployment recommendation
  - Deploy an endpoint in a few steps

# AWS SageMaker- Studio

Providers 12

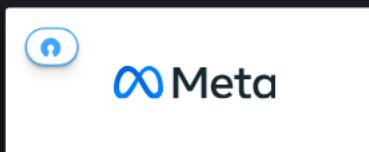
Search providers or models...



HuggingFace

Explore hundreds of popular and trending models from HuggingFace.

[View 307 models >](#)



Meta

Explore popular and trending models from Meta including Llama, Code Llama, and more.

[View 23 models >](#)



AI21

Explore popular and trending models from AI21 Labs including Jurassic and more.

[View 6 models >](#)



Stability AI

Explore popular and trending models from Stability.ai including Stable Diffusion and more.

[View 11 models >](#)



Cohere

Explore popular and trending models from Cohere including Command, Rerank, and more.

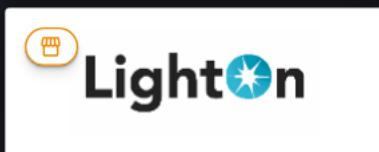
[View 8 models >](#)



TensorFlow

Explore popular and trending models from TensorFlow for computer vision and NLP tasks.

[View 319 models >](#)



LightOn

Explore popular and trending models from LightOn including mini-instruct models.

[View 2 models >](#)



NCSoft

Explore popular and trending models from NCsoft including VARCO LLM models.

[View 2 models >](#)



LG CNS

Explore popular and trending models from LG CNS including EXAONE Atelier and more.

[View 1 models >](#)



Jina AI

Explore popular and trending models from Jina AI including Jina Embeddings model and more.

[View 1 models >](#)



Amazon

Explore popular and trending models from AWS for computer vision, NLP, and tabular tasks.

[View 36 models >](#)

# AWS SageMaker- Studio

SageMaker Studio > Jumpstart > Tensorflow

 **TensorFlow**  
Explore popular and trending models from TensorFlow for computer vision and NLP tasks.

**Models** 319

Search models...

 **Image Classification**  
by TensorFlow

Image Classification

 **Object Detection**  
by TensorFlow

Object Detection

 **Text Classification**  
by TensorFlow

Text Classification

 **Text Embedding**  
by TensorFlow

Text Embedding

 **Sentence Pair Classification**  
by TensorFlow

Sentence Pair Classification

 **Image Embedding**  
by TensorFlow

Image Embedding

 **Object Detection**  
by TensorFlow

Object Detection

 **MobileNet V3 Large 1.00 224**  
by TensorFlow

Image Classification

 **EfficientNet B1**  
by TensorFlow

Image Classification

 **EfficientNet V2 ImageNet-21k FT1k M**  
by TensorFlow

Image Classification

**Filters**

**Action**

Trainable

**Task**

Audio Embedding

Image Classification

Image Embedding

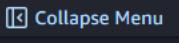
Object Detection

Sentence Pair Classification

Text Classification

Text Embedding

 Feedback

 Collapse Menu

# AWS SageMaker- Studio

SageMaker Studio > Jupyterlab > Aa

Applications (5)

jupyter aa Private

JupyterLab • 5 GB • ml.t3.medium

Status: Running

Instance: ml.t3.medium

Image: SageMaker Distribution 1.4

Space Settings (New)

A space is a named, self-contained, durable storage container (like a filesystem), to which an app can be attached.

Storage (GB): 5

Lifecycle Configuration: No Script

Attach custom EFS filesys: None

Enter a value from 5 to 100 GB. Please contact your administrator for larger storage volume.

Home

Running instances

Data

Data Wrangler

Aggregate & prepare data

Feature Store

Store & share features

EMR Clusters

Compute clusters for batch work

Auto ML

Experiments

Jobs

Training

Model evaluation

# AWS SageMaker- Studio

File Edit View Run Kernel Git Tabs Settings Help

+ + ⌂

Filter files by name

Name Last Modified

Launcher

Python 3 (ipykernel) Glue PySpark and Ray Glue Spark SparkMagic PySpark SparkMagic Spark

Console

Python 3 (ipykernel) Glue PySpark and Ray Glue Spark SparkMagic PySpark SparkMagic Spark

Other

Terminal Text File Markdown File Python File Notebook Jobs Show Contextual Help

35

# AWS SageMaker- Studio---- Very Important

The screenshot shows the AWS SageMaker Studio interface with a dark theme. The left sidebar contains navigation links: Home, Running instances (selected), Data, Auto ML, Experiments, Jobs, Pipelines, Models, JumpStart, and Deployments. The main content area is titled "Running instances" and displays information about how running instances work, including stopping, shared spaces, and restarting applications. A table lists one running instance named "aa" with details: Application (JupyterLab), Status (Running), Sharing (Private), Instance (ml.t3.medium), Storage (5 GB), CreateBy (default-170849047...), and CreatedTime (5 minutes ago). A "Stop" button is shown next to the instance row. The bottom right corner has a "Feedback" button.

SageMaker Studio > Running Instances

Applications (5)

JupyterLab RStudio Canvas

Code Edi... Studio Cl...

Home

Running instances

Data

Auto ML

Experiments

Jobs

Pipelines

Models

JumpStart

Deployments

Collapse Menu

## Running instances

View and stop running instances across all your available applications and spaces.

How running instances work

Stop Shared spaces Restart application

Click stop to shut down any running application or space to which you have access.

Remember that before stopping a shared space you should let your team know to prevent data loss.

Search...

Name	Application	Status	Sharing	Instance	Storage	CreateBy	CreatedTime	Action
aa	JupyterLab	Running	Private	ml.t3.medium	5 GB	default-170849047...	5 minutes ago	<button>Stop</button>

1 results Results are cached Refresh Go to page 1 Page 1 of 1 < >

Feedback

# AWS SageMaker- Studio---- Delete Domain

SageMaker Services Search [Alt+S] N. Virginia Farid\_winter2024

Amazon SageMaker X

Getting started Studio Studio Lab Canvas RStudio TensorBoard Profiler Admin configurations Domains Role manager Images Lifecycle configurations SageMaker dashboard Search JumpStart Foundation models Computer vision models Natural language processing models Governance HyperPod Clusters

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240220T232800 > User Details: default-1708490478592

User Details

General details about this user profile.

Launch ▾

Apps

App name	Status	App type	Created	Action
default	Deleted	DetailedProfiler	Tue Feb 20 2024 23:56:56 GMT-0500 (Eastern Standard Time)	Delete app

Details

Name	Execution role
default-1708490478592	arn:aws:iam::730335673928:role/service-role/AmazonSageMaker-ExecutionRole-20240220T232803
Created On	Status
Tue Feb 20 2024 23:41:32 GMT-0500 (Eastern Standard Time)	InService
ID	Modified On
d-wqberqhmab2t	Tue Feb 20 2024 23:41:34 GMT-0500 (Eastern Standard Time)
Space Type	Owner User Profile Name
-	-

Cancel Edit

# AWS SageMaker- Studio---- Delete Domain

Sales Services Search [Alt+S] N. Virginia ▾ Farid\_winter2024 ▾ ⓘ

Amazon SageMaker > Domains > Domain: QuickSetupDomain-20240220T232800 > User Details: default-1708490478592 > Edit user profile

## Edit user profile

Step 1 General settings

Step 2 Studio settings

Step 3 RStudio settings

Step 4 Canvas settings

### General settings

User profile and details.

#### User profile

Execution role

The default execution role for both users and spaces in the domain. The execution role must have the [AmazonSageMakerFullAccess](#) policy attached.

AmazonSageMaker-ExecutionRole-20240220T232803

Create role using the role creation wizard

#### Delete user

To delete a user, the user cannot contain any non-failed apps

Delete user

#### Tags - optional

Add tag

You can attach up to 50 tags

# AWS SageMaker- Studio Last step

- **Step 1: Identify Associated Spaces**
  1. **Navigate to SageMaker Studio:** Log in to your AWS Management Console and open the SageMaker service. Then, go to the SageMaker Studio section.
  2. **Find the User Profile:** Locate the user profile mentioned in the error message. This involves identifying the domain it belongs to and then finding the specific user profile.
- **Step 2: List and Identify Spaces**
  3. **Access the User Profile:** Once you've found the user profile, you need to list all the spaces associated with it. Spaces in SageMaker Studio represent environments or sessions where users can run Jupyter notebooks, experiments, etc.
  4. **Identify Spaces to Delete:** Check each space associated with the user profile to ensure there are no active or needed resources. Remember, you need to delete these spaces to proceed with deleting the user profile.
- **Step 3: Delete Associated Spaces**
  5. **Delete Spaces:** For each space associated with the user profile, you'll need to delete it. The process for deleting a space varies depending on how it's managed in SageMaker Studio. Generally, you would navigate to the space's settings or manage spaces area within the Studio interface and look for a delete option.
  6. **Confirm Deletion:** Ensure each space is fully deleted. This might take a few moments, and you may need to refresh the interface or recheck to confirm the deletion.

# AWS SageMaker- AWS SageMaker- Studio Last step

- **Step 4: Retry Deleting the User Profile**

**7. Attempt to Delete User Profile Again:** After confirming that all spaces associated with the user profile have been deleted, attempt to delete the user profile again. Navigate to the user profile settings within SageMaker Studio and select the option to delete the user profile.

**8. Check for Confirmation:** Wait for AWS to confirm that the user profile has been successfully deleted. This might take a few moments.

- **Troubleshooting Tips**

- **Check for Non-failed Apps:** Ensure that there are no non-failed apps remaining in the spaces you're attempting to delete. All apps must be deleted or in a failed state before you can delete a space.
- **Permissions:** Make sure you have the necessary permissions to delete spaces and user profiles. If you encounter permission issues, you may need to adjust your IAM policies or consult with your AWS administrator.
- **AWS Documentation:** For specific details or if you encounter unusual issues, refer to the AWS SageMaker documentation or contact AWS support for guidance.
- Following these steps should resolve the issue by allowing you to delete the spaces associated with the user profile, thereby enabling the deletion of the user profile itself.

# AWS SageMaker-Canvas

- **User-Friendly Interface**

- No-Code ML Model Building:** SageMaker Canvas provides a drag-and-drop interface that allows users to easily build ML models by simply selecting their data sources and defining what they want to predict.
- Visual Data Preparation:** Users can import, clean, and prepare their data using the visual interface, which supports tasks like handling missing values and encoding categorical variables without writing code.

- **Broad Data Accessibility**

- Direct Data Access:** It allows users to directly access data from various sources such as Amazon S3, Snowflake, Salesforce, and other databases. This eliminates the need for complex data extraction and loading processes.
- Combining Data Sources:** Users can combine data from multiple sources seamlessly within the tool, enabling richer datasets for more accurate model predictions.

- **Automated Model Building and Training**

- Automated Feature Engineering:** SageMaker Canvas automatically performs feature engineering, selecting the most relevant features for the model based on the data provided.
- Model Training and Evaluation:** The tool automatically trains multiple models behind the scenes, evaluates their performance, and selects the best model for deployment based on the chosen prediction task.

# AWS SageMaker-Canvas

- **Easy Deployment and Sharing**
  - **One-Click Deployment:** Deploying models for making predictions is straightforward, with a one-click deployment feature that makes the model accessible for applications.
  - **Share Insights:** Users can easily share their models and predictions with colleagues, facilitating collaboration and decision-making across teams.
- **Integrated with AWS Ecosystem**
  - **Scalability and Security:** Being part of the AWS ecosystem, SageMaker Canvas benefits from the scalability, reliability, and security features of AWS, ensuring that models can handle large datasets and are protected by robust security measures.
  - **Integration with SageMaker:** For more advanced use cases, models developed in Canvas can be further refined or customized using AWS SageMaker, providing a pathway for users to transition from no-code to more sophisticated model development if needed.
- **Use Cases Across Industries**
  - **Versatile Applications:** SageMaker Canvas can be used across a wide range of industries for various purposes, such as predicting customer churn, forecasting sales, identifying fraud, and more, without requiring users to have machine learning expertise.

# AWS SageMaker- Building a Machine Learning Model with Amazon SageMaker Canvas

## • Introduction

- We are going to explore the fascinating world of machine learning (ML) by undertaking a practical project: converting temperatures from Celsius to Fahrenheit. This project employs Amazon SageMaker Canvas, an innovative tool that allows us to create powerful ML models without the need for programming or prior knowledge in artificial intelligence (AI) and ML.

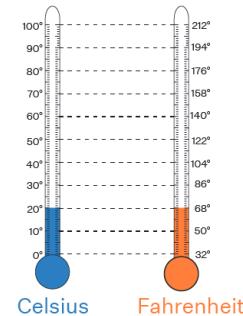
## • Objectives

- Understand the basics of machine learning.
- Learn about Amazon SageMaker Canvas and its capabilities.
- Apply a simple formula for temperature conversion within an ML model.
- Demonstrate the practical application of ML in everyday scenarios.

## • Materials Needed

- Internet access
- Amazon Web Services (AWS) account
- Access to Amazon SageMaker Canvas

Celsius and Fahrenheit Scales



# AWS SageMaker- Canvas

AWS Services Search [Alt+S] X

Amazon SageMaker

- Getting started
- Studio
- Studio Lab
- Canvas**
- RStudio

Admin configurations

- Domains
- Role manager
- Images
- Lifecycle configurations

SageMaker dashboard

Search

JumpStart

- Foundation models
- Computer vision models
- Natural language processing models

Governance

Ground Truth

Notebook

Processing

Training

Inference

Augmented AI

Amazon SageMaker

## SageMaker Canvas

Generate accurate machine learning predictions — no code required

### How it works

Watch on YouTube

Get started with Amazon SageMaker Canvas

Get Started

Create an [Amazon SageMaker domain](#) to use Studio and Studio Notebooks.

Create a SageMaker domain

Pricing (US)

AWS Free Tier

If you are new to SageMaker you are eligible for the AWS Free Tier which includes up to 10 models with up to 1M cells of data free for the first 2 months.

Learn More

Documentation

- Getting Started
- Setting up SageMaker Canvas
- Managing SageMaker Canvas

Features [View all](#)

# AWS SageMaker- Canvas- Create a Domain

The screenshot shows the AWS SageMaker Canvas interface for creating a domain. At the top, there's a banner about geospatial capability availability. The main navigation bar includes 'Services' and 'Search'. On the left, a sidebar lists various SageMaker features like 'Getting started', 'Studio', 'Canvas', 'RStudio', and sections for 'Admin configurations', 'JumpStart', 'Governance', and specific tasks like 'Ground Truth', 'Notebook', 'Processing', 'Training', 'Inference', and 'Augmented AI'. The main content area is titled 'Set up SageMaker Domain' and describes using it to manage configuration. It offers two setup options: 'Set up for single user (Quick setup)' and 'Set up for organizations'. The 'Quick setup' option is highlighted with a yellow box around its button. Both options list several configuration items with checkboxes. The 'Set up for organizations' section also includes a note for admins with large user groups.

Sagemaker geospatial capability is now generally available in us-west-2

Amazon SageMaker geospatial capabilities make it easier for data scientists and machine learning (ML) engineers to build, train, and deploy ML models faster using geospatial data.

Learn more

Amazon SageMaker

Getting started

Studio

Studio Lab

Canvas

RStudio

Admin configurations

Domains

Role manager

Images

Lifecycle configurations

SageMaker dashboard

Search

JumpStart

Foundation models

Computer vision models

Natural language processing models

Governance

Ground Truth

Notebook

Processing

Training

Inference

Augmented AI

Set up SageMaker Domain

Set up SageMaker Domain as the central store to manage the configuration of SageMaker for your organization.

**Set up for single user (Quick setup)**

Let Amazon SageMaker configure your account, and set up permissions for your SageMaker Domain.

- New IAM role with AmazonSageMakerFullAccess policy
- Public internet access, and standard encryption
- SageMaker Studio - New, and SageMaker Studio Classic integrations
- Sharable SageMaker Studio Notebooks
- SageMaker Canvas
- IAM Authentication

Perfect for single user domains and first time users looking to get started with SageMaker.

**Set up for organizations**

Control all aspects of account configuration, including permissions, integrations, and encryption.

- Advanced network security, and data encryption
- SageMaker Studio - New, SageMaker Studio Classic, RStudio, and Code Editor Based on Code-OSS, Visual Studio Code Open Source integrations
- SageMaker Studio Projects, and Jumpstart
- SageMaker Canvas, and Amazon services integrations
- IAM, or IAM Identity Center (successor to AWS SSO)

Better for admins with large user groups, but you can always update your account configuration settings later if you want to do a quick setup now.

Set up

# AWS SageMaker- Canvas- Create a Domain...Pending

The screenshot shows the AWS SageMaker Canvas Domains page. The left sidebar contains navigation links for SageMaker services like Studio, Studio Lab, Canvas, RStudio, Admin configurations (Domains, Role manager, Images, Lifecycle configurations), SageMaker dashboard, Search, JumpStart (Foundation models, Computer vision models, Natural language processing models), Governance, Ground Truth, Notebook, Processing, Training, Inference, and Augmented AI. The main content area displays a table titled "Domains (1) Info" with one row. The row details a domain named "QuickSetupDomain-20240221T155745" with ID "d-n0d8ljkckebf", status "Pending", created on "Feb 21, 2024 20:57 UTC", and modified on "Feb 21, 2024 20:57 UTC". Action buttons for "View", "Edit", and "Create domain" are visible at the top right of the table.

Name	Id	Status	Created on	Modified on
QuickSetupDomain-20240221T155745	d-n0d8ljkckebf	Pending	Feb 21, 2024 20:57 UTC	Feb 21, 2024 20:57 UTC

# AWS SageMaker- Canvas- Model Preparation

The screenshot shows the AWS SageMaker Canvas interface for model preparation. On the left, there is a vertical sidebar with several icons: a blue square, a grey square, a circular arrow, a star, three horizontal bars, two circles, a question mark, a right-pointing arrow, and a speech bubble.

The main content area has a header bar with the following elements from left to right: "My models > My-first-Model", a "Add version" button with a plus sign, a "Share" button with a person icon, and a three-dot menu icon.

The main section is titled "Versions" and contains the message "Select a version to view details". To the right of this message is a toggle switch labeled "Show advanced metrics".

A table is displayed with the following columns: Version, Status, Created, Dataset, Model score, Shared, and Model Registry. The first row shows a single entry:

Version	Status	Created	Dataset	Model score	Shared	Model Registry
v1	In draft	02/21/2024 5:14 PM	canvas-sa...	--	--	Not Registered ⓘ

# AWS SageMaker- Canvas- Model Preparation

New dataset 20...: Create Tabular dataset X

Data Source: Local upload ▾

**Upload files to import**

Drag a CSV or Parquet file here

or

Select files from your computer

• Dataset size must be smaller than 5 GB  
• Dataset can't contain both CSV and Parquet files

[Learn more](#)

Cancel **Create dataset**

# AWS SageMaker- Canvas- Model Preparation

New dataset 2024-2-21 4:57 PM Previewing first 100 rows

X

Celsius	Fahrenheit
-50	-58
-40	-40
-30	-22
-20	-4
-10	14
-9	15.8
-8	17.6
-7	19.4
-6	21.2
-5	23
-4	24.8
-3	26.6
-2	28.4
-1	30.2

Select dataset

9

# AWS SageMaker- Canvas- Model Preparation

My models > My-first-Model > Version 1

Add version Quick build

Select Build Analyze Predict Deploy

**Select a column to predict**

Choose the target column. The model that you build predicts values for the column that you select.

Target column

**Model type**

SageMaker Canvas automatically recommends the appropriate model type for your analysis.

To see a recommended model type, specify a value for the target column.

New dataset 2024-2-21 4:57 PM

Full dataset: 510 rows

Manage columns Manage rows Time series View all

Data visualizer

Column name	Data type	Feature type	Missing	Mismatched	Unique	Mode
Fahrenheit	123 Numeric	-	0.00% (0)	0.00% (0)	30	-22
Celsius	123 Numeric	-	0.00% (0)	0.00% (0)	30	-1

# AWS SageMaker- Canvas- Model Preparation

My models > My-first-Model > Version 1

Add version

Select Build Analyze Predict Deploy

**Select a column to predict**  
Choose the target column. The model that you build predicts values for the column that you select.

Target column: Fahrenheit

Value distribution:

**Model type**  
SageMaker Canvas automatically recommends the appropriate model type for your analysis.

Numeric prediction  
For the Fahrenheit, your model predicts numeric values.

[Configure model](#)

**Quick build**

Standard build  
Choose accuracy over speed. Building usually takes between 2–4 hours.

Quick build  
Choose speed over accuracy. Building usually takes 2–15 minutes. You can't share quick build models.

New dataset 2024-2-21 4:57 PM | Manage columns | Manage rows | Time series | View all |

Full dataset: 510 rows

Column name ↓	Data type	Feature type	Missing	Mismatched	Unique	Mode	Correlation to target
Fahrenheit	123 Numeric	-	0.00% (0)	0.00% (0)	30	-22	--
Celsius	123 Numeric	-	0.00% (0)	0.00% (0)	30	-1	1

# AWS SageMaker- Canvas- Model Preparation

My models > My-first-Model > Version 1

Add version

⋮

Select Build Analyze Predict Deploy

### Model overview

Your model is being created. Quick build usually takes 2–15 minutes. You can now leave this view.

Expected build time: 2–15 minutes

Build type: Quick build

Detailed progress: Generating column impact



New dataset 2024-2-21 4:57 PM Total columns: 2 Total rows: 510 Total cells: 1,020 Fahrenheit Numeric prediction