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ML Model Development

Amazon SageMaker provides a comprehensive solution for building, training, and deploying ML models. It also enables the following:

- **Data Preparation:** Load and preprocess data using SageMaker's built-in notebooks or data wrangling features.
- **Model Development and Training:** Develop and train ML models using SageMaker's built-in algorithms like TensorFlow and PyTorch on scalable compute resources and adjust hyperparameters using automated tuning.
- **Model Deployment:** Deploy trained models to real-time SageMaker endpoints to serve predictions and monitor model performance.

Prebuilt AI Models

Amazon Bedrock provides access to foundational AI models from various providers such as Meta, Amazon, and Anthropic via a single API. It allows developers to build and scale generative AI applications without managing infrastructure. Bedrock supports customizing foundational AI models for specific use cases, such as text and image generation and search.

Amazon Comprehend is a natural language processing (NLP) service that uses ML to analyze text in real-time. Comprehend helps extract insights from documents, customer feedback, or any text-based data.

Amazon Rekognition provides image and video analysis with pre-built deep learning models. The service enables advanced visual search and content moderation in media to detect inappropriate content.

Amazon Polly is a text-to-speech service that uses deep learning to convert written text into lifelike speech. It offers a range of natural-sounding voices and supports multiple languages.

Amazon Transcribe is a speech-to-text service that supports a variety of languages and audio formats. It provides accurate transcriptions with features like speaker identification and custom vocabulary.

Amazon Translate is a machine translation service that provides high-quality, real-time language translation. It supports a wide range of languages and can be used to localize applications, websites, and content.

Amazon Textract automatically extracts text and data from scanned documents and images. Textract helps streamline document processing workflows by converting unstructured data into actionable insights.

AI for Enthusiasts

AWS DeepRacer is an ML service for developing reinforcement learning models and applying them to autonomous racing. It provides a 1/18th scale race car and a virtual simulator to test and refine models.

AWS DeepComposer allows developers to explore ML through music composition. It uses generative models to create original music based on user input. It provides a hands-on way to understand and experiment with ML concepts in a creative domain.

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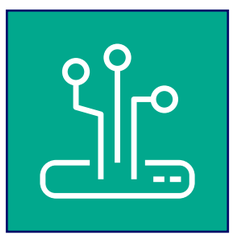
Data Labeling

	**Amazon Augmented AI** (A2I) is a service that uses Amazon Textract and Amazon Rekognition to integrate a large number of human reviews into ML workflows, making it a key tool for data labeling and verification. It enables human reviewers to validate low-confidence predictions from AI models.

Health AI

	**AWS HealthImaging** provides a suite of services for managing and analyzing medical imaging data. It enables secure storage, scalable processing, and efficient retrieval of health-related images.
	**AWS HealthLake** is designed to store, transform, and analyze health data at scale. It aggregates data from various sources into a centralized repository, allowing for advanced analytics and ML. It is a HIPAA-eligible service that helps healthcare organizations gain insights and improve patient care with a unified view of health information.
	**AWS HealthOmics** provides scalable and secure tools for analyzing and managing genomic data. It enables integration and analysis of large-scale omics data, facilitating insights into genetic conditions and disease mechanisms.
	**Amazon Comprehend Medical** extracts medical information from unstructured text like patient records or clinical reports. It identifies entities like medical conditions, medications, and treatments.

Specialized AI Services

	**Amazon CodeGuru** is a developer tool that uses ML to identify code quality issues and suggest improvements. It provides automated code reviews and performance recommendations for Java and Python applications.
	**Amazon DevOps Guru** uses ML to identify operational issues in applications. Integrates with AWS services to monitor resources and suggest improvements for application reliability.
	**AWS Panorama** is an ML SDK for running computer vision models on local devices. It enables integration with existing cameras without cloud connectivity and helps automate tasks like monitoring safety, productivity, and operational efficiency in physical environments.

Conversational AI

	**Amazon Lex** is a service for building conversational interfaces using voice and text. It leverages the same deep learning technologies as Amazon Alexa to understand natural language and map intent. Lex enables easy creation of chatbots and virtual assistants with integrated voice and text capabilities.
	**Amazon Kendra** is an intelligent search service that uses ML to deliver accurate search results. It enables organizations to index and search their data across multiple repositories. Kendra provides natural language search capabilities and context-aware responses to implement user-friendly bots and assistance solutions.

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Industry-Specific Solutions

	**Amazon Q** is a versatile AI tool that can generate, transform, test, and debug code for developers. It also has reasoning capabilities; we can connect enterprise data repositories with it, which enables it to answer questions from company employees or clients about company policies or services.
	**Amazon Forecast** provides support for generating accurate time-series forecasts using ML. It is useful in the prediction of future trends in multiple fields, including retail, finance, healthcare, and custom domain-specific metrics like web traffic and finances of a company based on the current data.
	**Amazon Fraud Detector** uses ML to identify and prevent online fraudulent activity in real-time. It analyzes patterns and anomalies in data to detect potential fraud. The service offers pre-built models and customizable options to tailor fraud detection to specific needs, such as identifying suspicious payments, detecting illegitimate new registrations for accounts, and detecting compromised accounts.
	**Amazon Personalize** enables real-time personalized recommendations by using ML. It automates the entire recommendation process, from data handling to model deployment. It helps improve user engagement and conversion rates by delivering relevant experiences.
	**Amazon Lookout for Metrics** detects anomalies in business metrics to identify and investigate the root cause. It integrates with AWS databases and third-party SaaS applications.
	**Amazon Lookout for Equipment** uses ML to detect anomalies and predict equipment failures. It analyzes data from sensors to identify signs of potential issues before they lead to downtime.
	**Amazon Lookout for Vision** uses ML to detect defects and anomalies in images for quality control. It trains custom models to recognize patterns and irregularities in visual data. This service helps improve product quality by identifying potential issues before they affect customers.
	**Amazon Monitron** is an end-to-end system that detects equipment anomalies and predicts maintenance needs. It simplifies industrial equipment monitoring by analyzing sensor data to prevent failures. Monitron helps reduce downtime and maintenance costs with automated insights.