Track 6 |Session 3

如何藉由 AWS AI 和機器學習平台搭建多功能的 AI 解決方案

Ivan Cheng (鄭志帆)
Manager, Solutions Architecture
Amazon Web Services

aws SUMMIT

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Centerpiece for digital transformation

Customer experience

Business operations

Decision making

Innovation

Competitive advantage

$50B

By 2021, global spending on AI and cognitive technologies will exceed $50 billion

Source: IDC, 2018

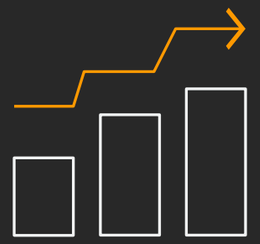
Our mission at AWS

Put machine learning (ML) in the hands of every developer

Why AWS for ML?

Broadest and deepest set of AI and ML services

200+ new features and services launched in the last year



Accelerate your adoption of ML with Amazon SageMaker

Up to 70% cost reduction in data labeling

Up to 10x faster performance

Up to 75% lower inference cost

Reduced deployment time

Built on the most comprehensive cloud platform optimized for ML

AWS named as a leader in Gartner's Infrastructure as a Service (IaaS) Magic Quadrant for the 9th consecutive year

ML is happening in companies of every size and in every industry

10,000+ customers | More ML happens on AWS than anywhere else

Technology

Bringing AI into your digital transformation requires a new stack that makes it easier to put ML to work

The AWS ML stack

Broadest and most complete set of ML capabilities

AI services

Vision
- Amazon Rekognition

Speech
- Amazon Polly
- Amazon Transcribe *+Medical* NEW

Text
- Amazon Comprehend *+Medical*
- Amazon Translate
- Amazon Textract

Search NEW!
- Amazon Kendra

Chatbots
- Amazon Lex

Personalization
- Amazon Personalize

Forecasting
- Amazon Forecast

Fraud NEW!
- Amazon Fraud Detector

Development NEW!
- Amazon CodeGuru

Contact centers NEW!
- Contact Lens *For Amazon Connect*

ML services

Amazon SageMaker

Ground Truth | Augmented AI | ML Marketplace

Amazon SageMaker Studio IDE NEW!

Built-in algorithms | Notebooks NEW! | Experiments NEW! | Model training & tuning | Debugger NEW! | Autopilot NEW! | Model hosting | Model Monitor NEW!

Neo

ML frameworks & infrastructure

TensorFlow | mxnet | PYTORCH | GLUON | Keras | HOROVOD

Deep learning AMIs & containers | GPUs & CPUs | Amazon Elastic Inference | AWS Inferentia | FPGA

The AWS ML stack

Broadest and most complete set of ML capabilities

AI services

Vision	Speech		Text			Search	Chatbots	Personalization	Forecasting	Fraud	Development	Contact centers
						NEW!				NEW!	NEW!	NEW!
Amazon Rekognition	Amazon Polly	Amazon Transcribe *+Medical* NEW	Amazon Comprehend *+Medical*	Amazon Translate	Amazon Textract	Amazon Kendra	Amazon Lex	Amazon Personalize	Amazon Forecast	Amazon Fraud Detector	Amazon CodeGuru	Contact Lens *For Amazon Connect*

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				Built-in algorithms	NEW! Notebooks	NEW! Experiments	Model training & tuning	NEW! Debugger	NEW! Autopilot	Model hosting	NEW! Model Monitor	

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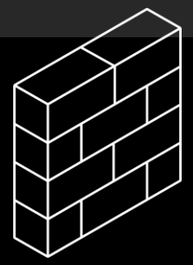
The ML workflow is iterative and complex

Bringing ML to all developers

Prepare

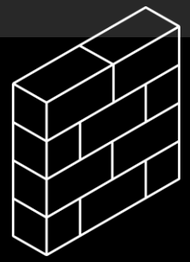


Collect and prepare training data

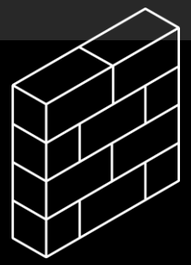
Build

Choose or build an ML algorithm

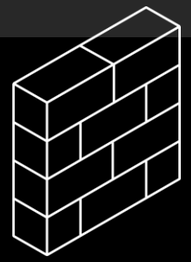
Train & tune



Set up and manage environments for training

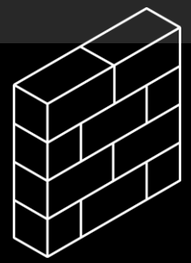


Train, debug, and tune models

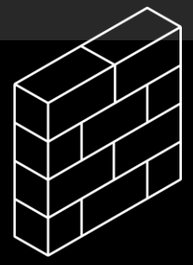


Manage training runs

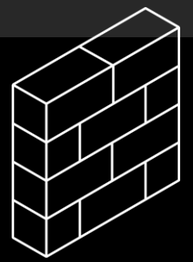
Deploy & manage



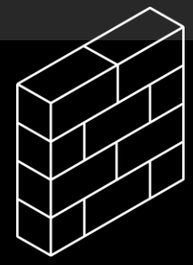
Deploy model in production



Monitor models

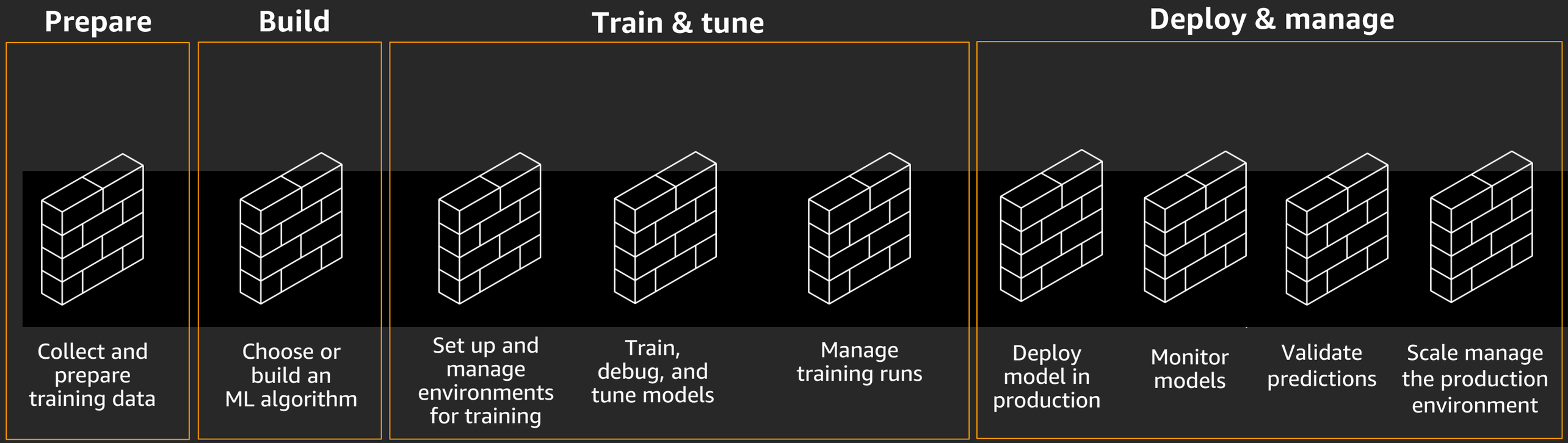


Validate predictions



Scale manage the production environment

Amazon SageMaker helps you build, train, and deploy models



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Prepare

Fully managed data processing jobs and data labeling workflows

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Collect and prepare training data

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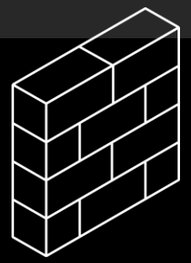

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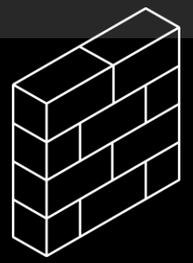

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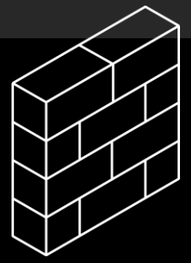
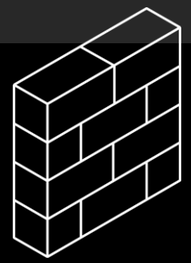


Train, debug, and tune models

Manage training runs

Deploy & manage



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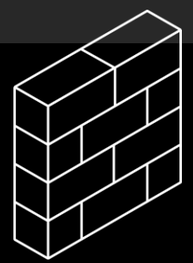

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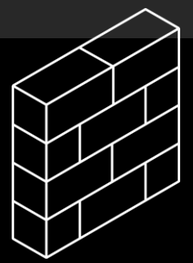

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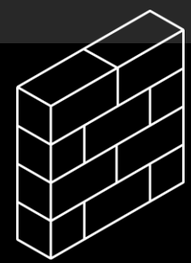

Scale manage the production environment

Web-based IDE for ML

Automatically build and train models

Amazon SageMaker helps you build, train, and deploy models

Prepare

Fully managed data processing jobs and data labeling workflows

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Collect and prepare training data

Build

One-click notebooks, built-in algorithms and models

Choose or build an ML algorithm

Classification
- Linear Learner
- XGBoost
- KNN

Working with text
- BlazingText
- Supervised
- Unsupervised

Computer vision
- Image classification
- Object detection
- Semantic segmentation

Recommendation
- Factorization machines

Anomaly detection
- Random Cut Forests
- IP insights

Regression
- Linear Learner
- XGBoost
- KNN

Topic modeling
- LDA
- NTM

Forecasting
- DeepAR forecasting

Feature reduction
- PCA
- Object2Vec

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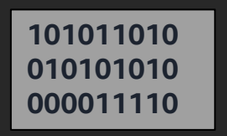

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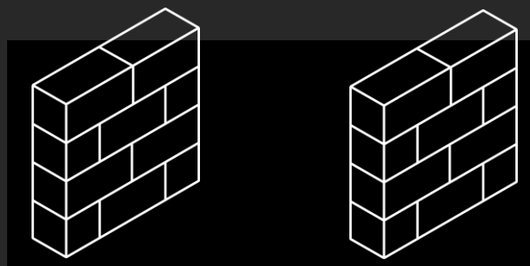

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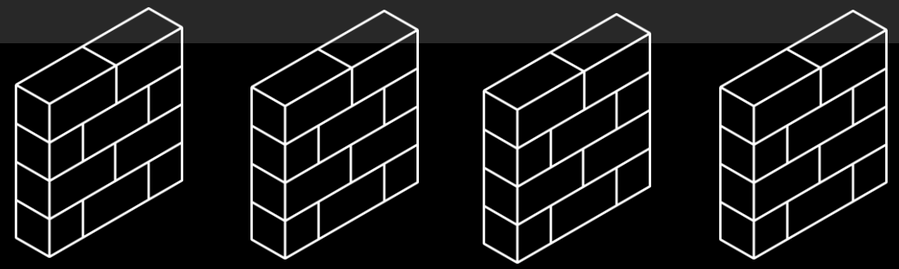

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Validate predictions

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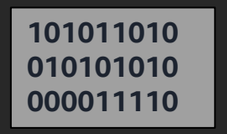

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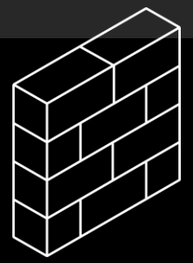

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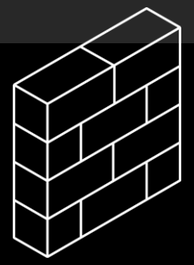

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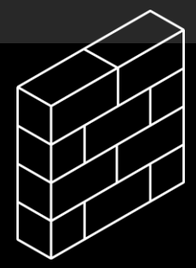

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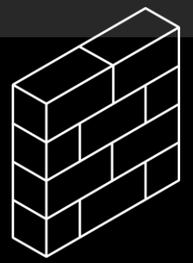

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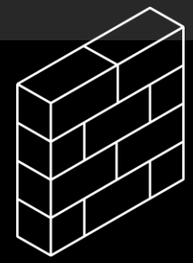

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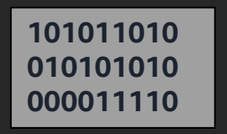

Collect and prepare training data

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Choose or build an ML algorithm

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Visually track and compare experiments

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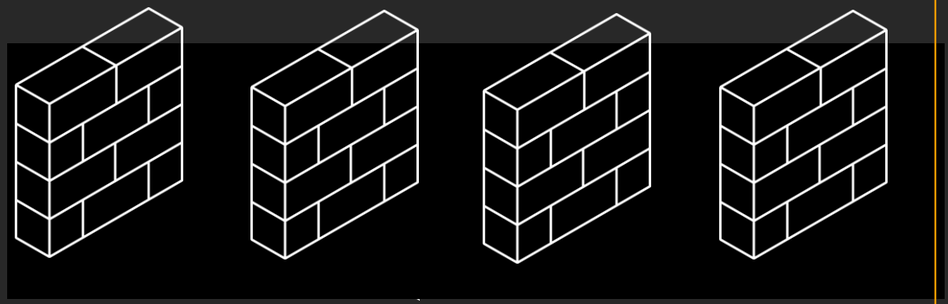

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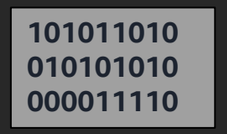

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One-click deployment and automatic scaling

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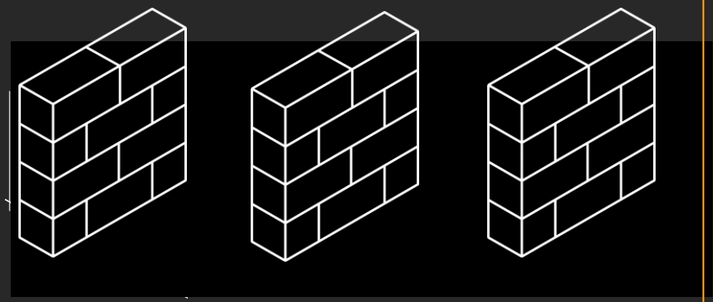

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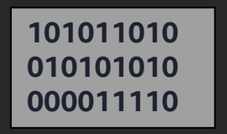

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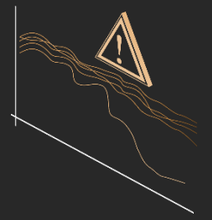

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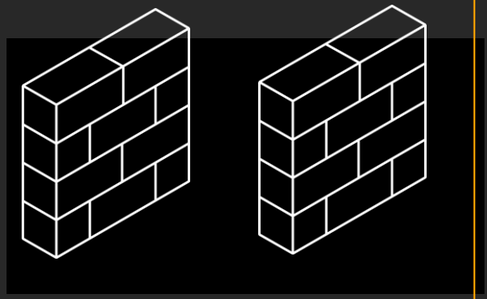

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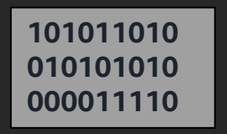

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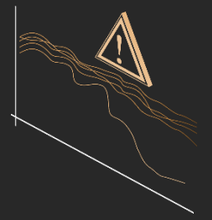
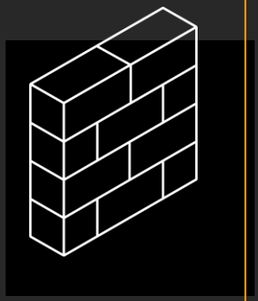


Monitor models

Add human review of predictions

Validate predictions



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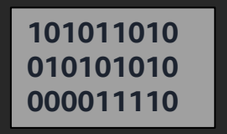

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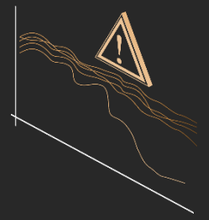

Monitor models

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Validate predictions

Fully managed with automatic scaling for 75% less

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The AWS ML stack

Broadest and most complete set of ML capabilities

AI services

Vision

Amazon Rekognition

Speech

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+Medical
NEW

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NEW! Autopilot

Model hosting

NEW! Model Monitor

Neo

ML frameworks & infrastructure

TensorFlow

mxnet

PYTORCH

GLUON

Keras

Deep learning AMIs & containers

GPUs & CPUs

Amazon Elastic Inference

AWS Inferentia

FPGA

New: Automate online fraud detection with Amazon Fraud Detector

Pre-built fraud detection model templates

Automatic creation of custom fraud detection models

Models learn from past attempts to defraud Amazon

Amazon SageMaker integration

One interface to review past evaluations and detection logic

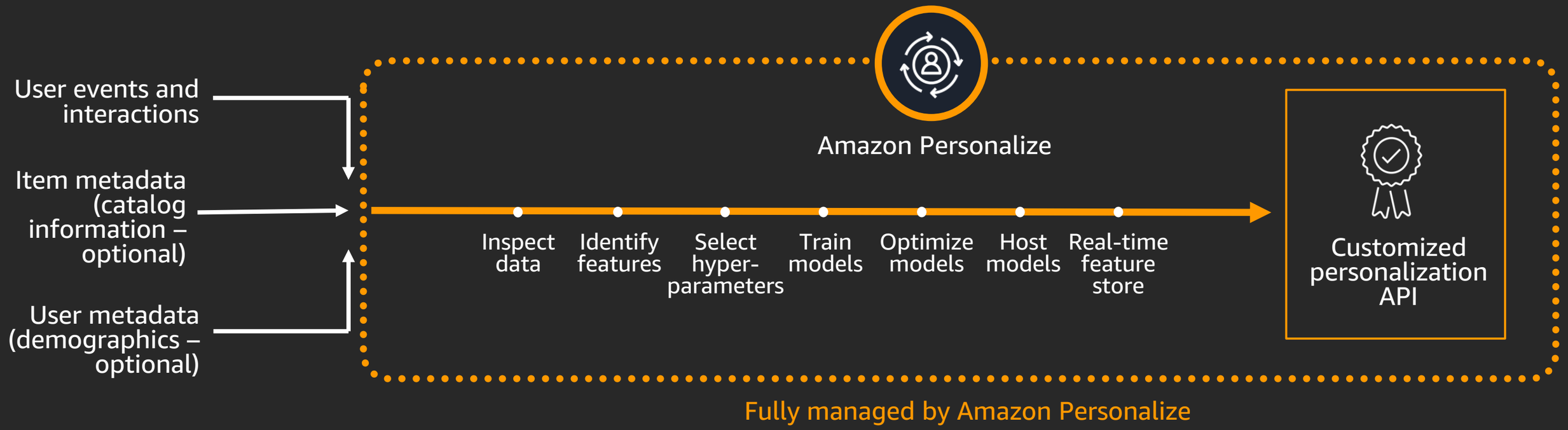
Amazon Personalize

Based on the technology that powers personalization at Amazon.com

- Fully managed service for generating personalized recommendations
- Uses the same ML technology that is being used at Amazon.com
- Generates highly relevant recommendations using deep learning techniques
- Does not require ML expertise to use
- Builds custom and private ML models using your own data

Amazon Personalize

Behind the scenes

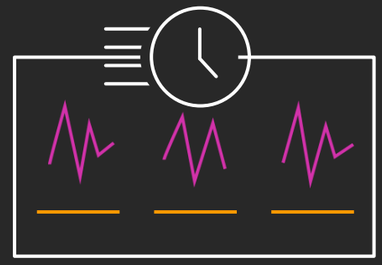


Amazon Personalize

Improve customer experiences with personalization and recommendations

Deliver high-quality recommendations

Real-time



Deliver personalization in days, not months

Works with any product or content

Key features

Context-aware recommendations	Automated ML	Continuous learning to improve performance	Bring existing algorithms from Amazon SageMaker

The AWS ML stack

Broadest and most complete set of ML capabilities

AI services

Vision	Speech		Text			Search	Chatbots	Personalization	Forecasting	Fraud	Development	Contact centers
						NEW!				NEW!	NEW!	NEW!
Amazon Rekognition	Amazon Polly	Amazon Transcribe *+Medical* NEW	Amazon Comprehend *+Medical*	Amazon Translate	Amazon Textract	Amazon Kendra	Amazon Lex	Amazon Personalize	Amazon Forecast	Amazon Fraud Detector	Amazon CodeGuru	Contact Lens *For Amazon Connect*

ML services

Amazon SageMaker	Ground Truth	Augmented AI	ML Marketplace	Amazon SageMaker Studio IDE NEW!								Neo
				Built-in algorithms	NEW! Notebooks	NEW! Experiments	Model training & tuning	NEW! Debugger	NEW! Autopilot	Model hosting	NEW! Model Monitor	

ML frameworks & infrastructure

TensorFlow	mxnet	PYTORCH	GLUON	Keras	HOROVOD	Deep learning AMIs & containers	GPUs & CPUs	Amazon Elastic Inference	AWS Inferentia	FPGA

Culture

Setting your organization up for success

Enabling the next ML developers

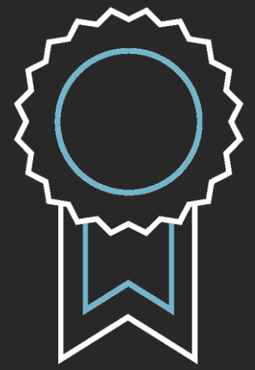
ML educational devices

AWS DeepLens
Deep learning

AWS DeepRacer
Reinforcement learning

AWS DeepComposer
Generative AI

Training and certification



AWS ML training
and certification

UDACITY

coursera

edX

Partnerships
with MOOCs

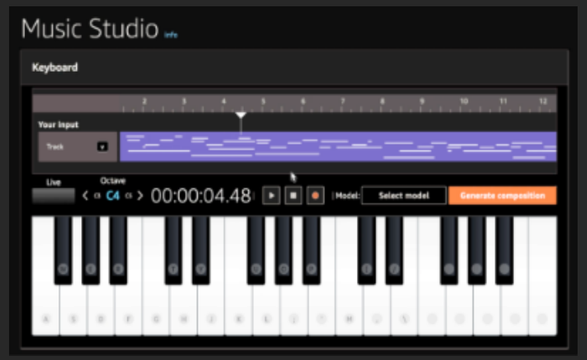
AWS

DeepComposer

The world’s first machine learning-enabled musical keyboard for developers

Creative meets generative

1



Input a melody by connecting the AWS DeepComposer keyboard

2

Choose from jazz, rock, pop, or classical, or build your own custom genre model in Amazon SageMaker

3

Publish your tracks to SoundCloud from the console; export MIDI files to your favorite DAW

AWS Machine Learning Solutions Lab

More than 100 deployed ML engagements

Ideation through to production

Global footprint

Cerner

AstraZeneca

Celgene

NFL

MAJOR LEAGUE BASEBALL

DigitalGlobe

COMPLETION
PROBABILITY
45.59%
EAGLES
JEFFERY
NFL
NEXT GEN
STATS
powered by
aws

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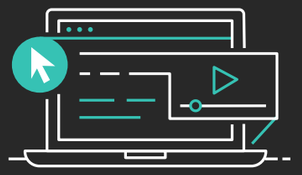

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Visit the ML learning paths at https://aws.training/ML

Thank you!

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