

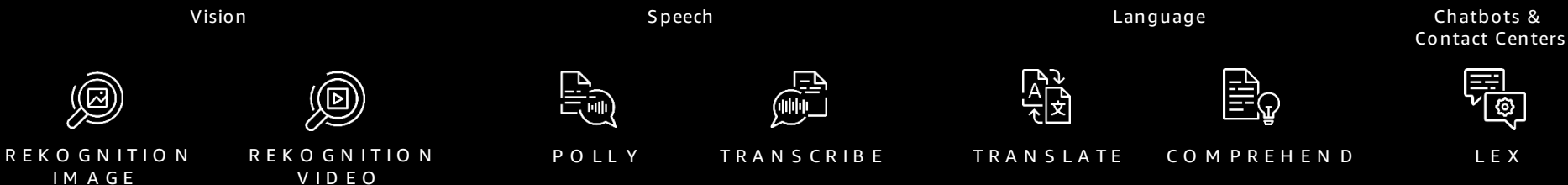
AWS INNOVATE
ONLINE CONFERENCE 2019
MACHINE LEARNING & AI EDITION

**Getting Started with Amazon SageMaker -
Build, Train, and Deploy Machine Learning
Models (Level 200)**

Tapan Hoskeri, Solution Architect, AISPL

The Amazon Machine Learning Stack

AI SERVICES



ML SERVICES



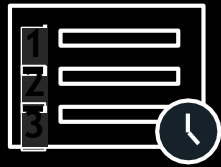
ML FRAMEWORKS & INFRASTRUCTURE



ML Is Still Too Complicated For Everyday Developers...



Collect and
prepare
training data



Choose and
optimize your
ML algorithm



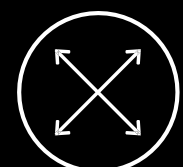
Set up and
manage
environments
for training



Train and
tune model
(trial and error)

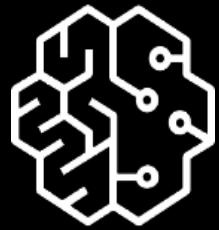


Deploy model
in production



Scale and manage
the production
environment

Machine Learning Made Simple



AMAZON
SAGEMAKER

One-Click

model training
& deployment

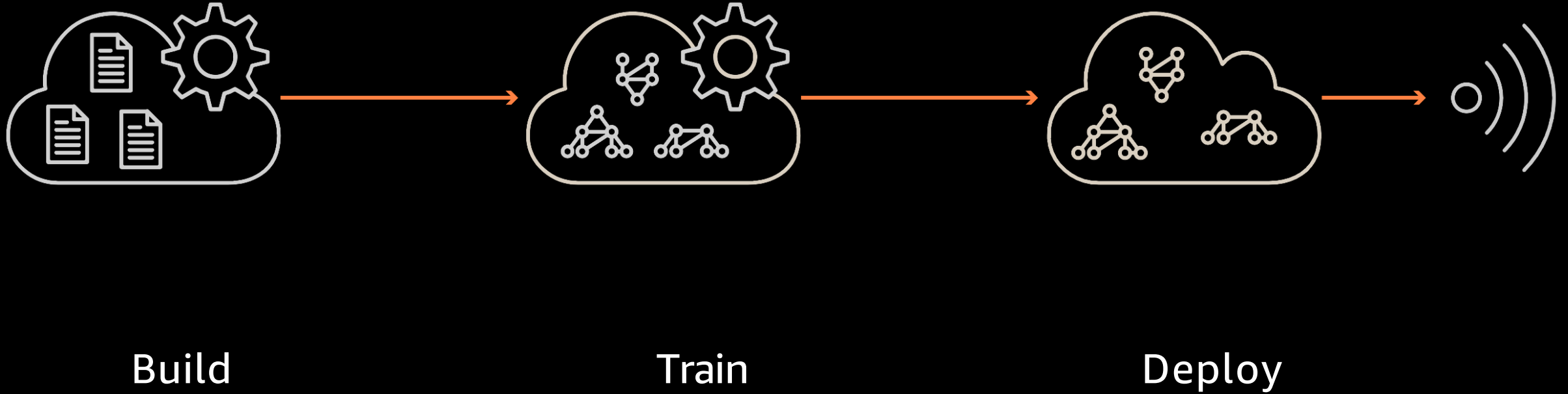
10x

better algorithm
performance

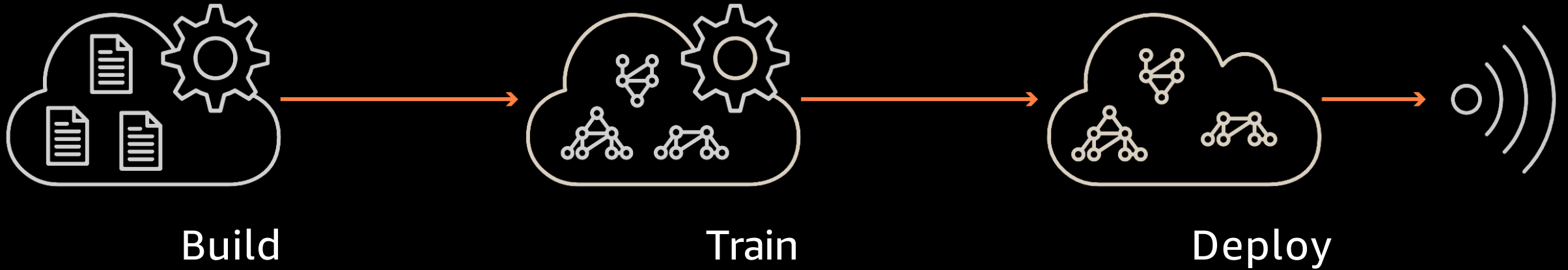
Predictive insights

to improve business
decision making

Amazon SageMaker Simplifies ML

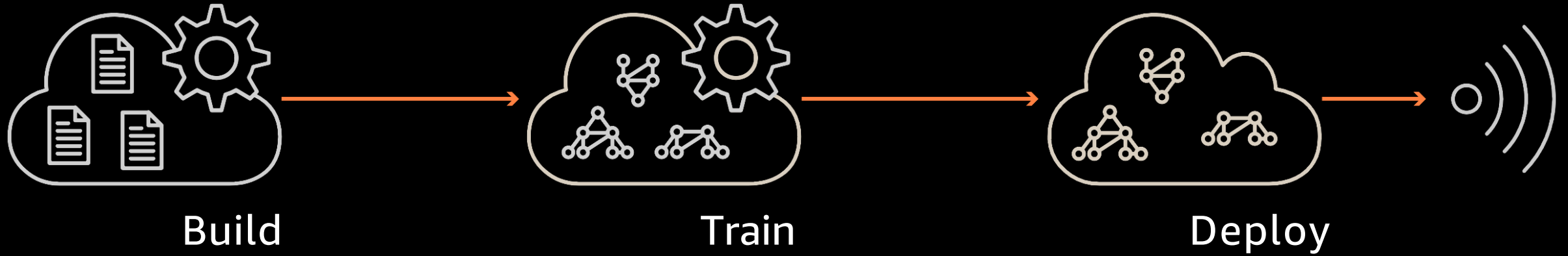


Amazon SageMaker Modules



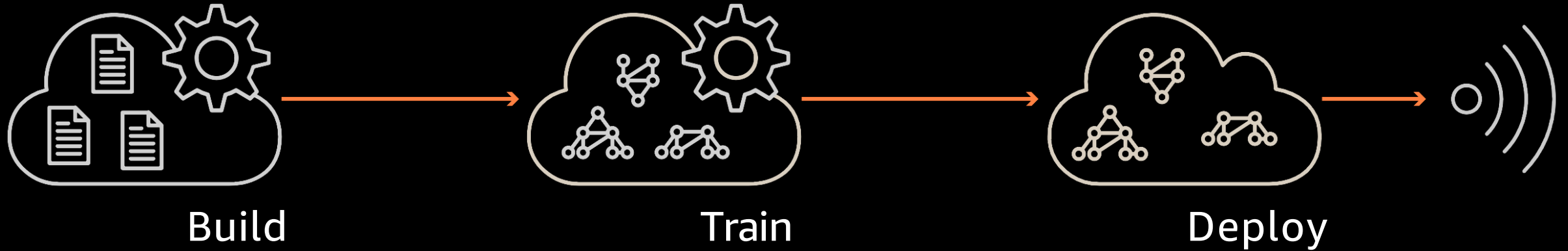
- Notebook instances
- Call APIs from your device

Amazon SageMaker Modules



- Managed
- Distributed
- High performance I/O

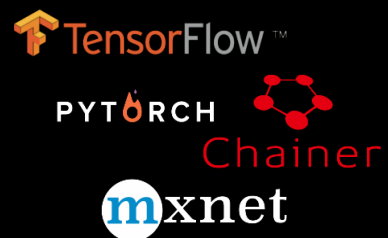
Amazon SageMaker Modules



- Realtime endpoints
- Batch transform
- AWS Greengrass
- AWS DeepLens



Amazon
SageMaker
algorithms



Frameworks



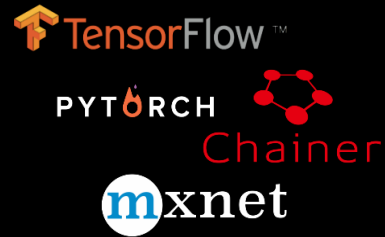
Bring
your own



Automatic
model tuning



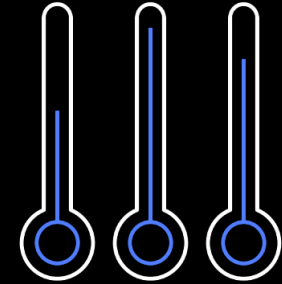
Amazon SageMaker algorithms



Frameworks



Bring your own



Automatic model tuning

- Designed for speed and scale
- Supervised, unsupervised, computer vision, and NLP

Amazon SageMaker Built-In Algorithms

Amazon SageMaker: broad set of built-in algorithms

ALGORITHMS

K-Means Clustering	XGBoost
Principal Component Analysis	Topic Modeling (LDA)
Neural Topic Modelling	Image Classification
Factorization Machines	Seq2Seq
Linear Learner (Regression)	Linear Learner (Classification)
BlazingText	DeepAR Forecasting
Reinforcement Learning	



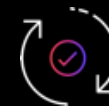
Designed to be 10x faster



Built into Amazon SageMaker



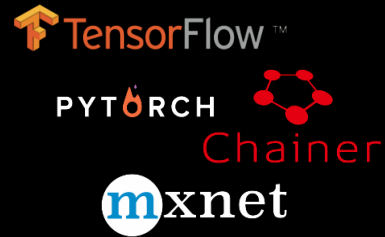
Improving and expanding continually



40% more algorithms added since SageMaker launch



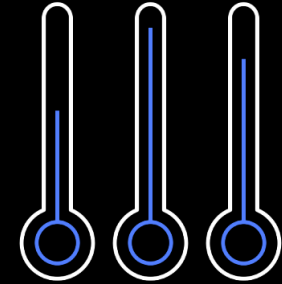
Amazon
SageMaker
algorithms



Frameworks



Bring
your own

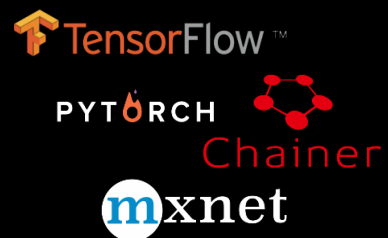


Automatic
model tuning

- 20 lines of Python
- Open sourced
- Local mode for testing



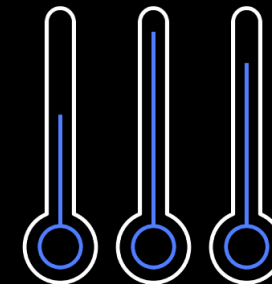
Amazon
SageMaker
algorithms



Frameworks



Bring
your own

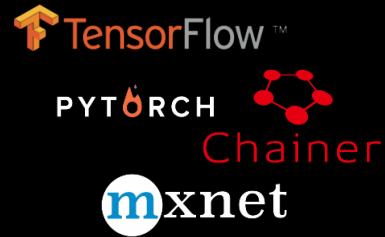


Automatic
model tuning

- Publish to a container registry
- R, Java, Julia, etc.



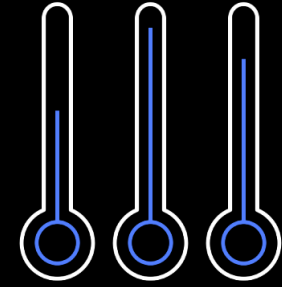
Amazon
SageMaker
algorithms



Frameworks



Bring
your own



Automatic
model tuning

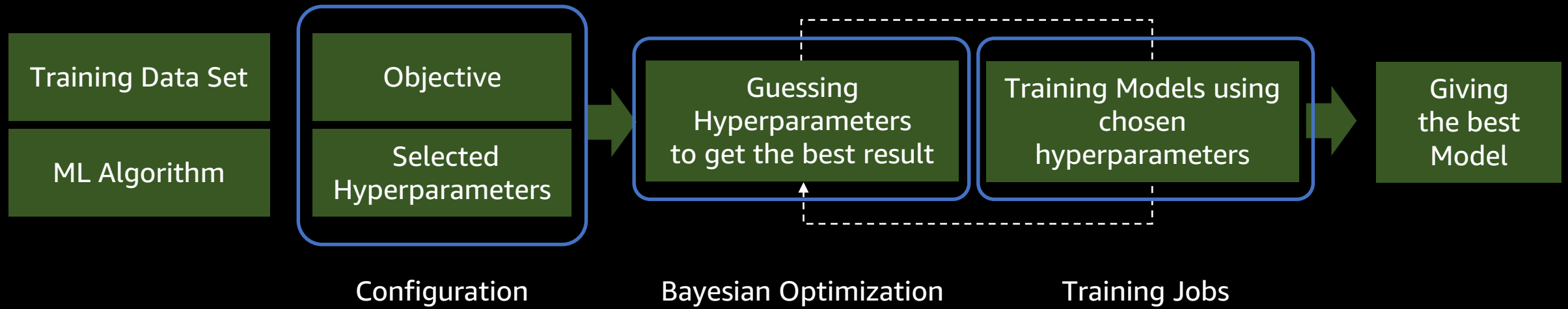
- Efficient meta-model hyperparameter tuning
- Works with algorithms, frameworks, and BYO

Automatic Model Tuning

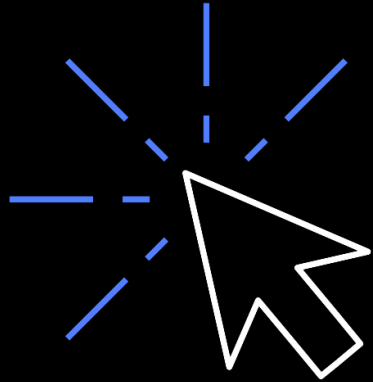
Hyperparameter tuning finds the best hyperparameter using Bayesian optimization

All ML Algorithms Supported

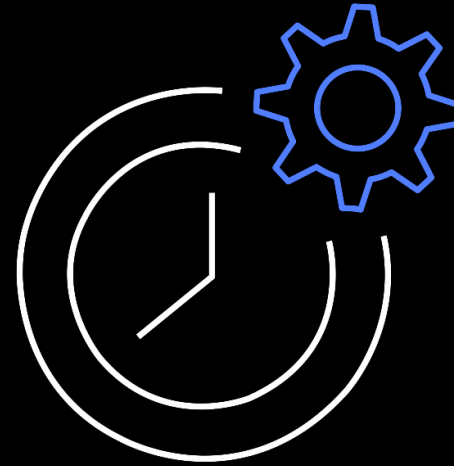
Amazon SageMaker Built-in Algorithms or custom algorithms



Create And Manage Endpoints Easily

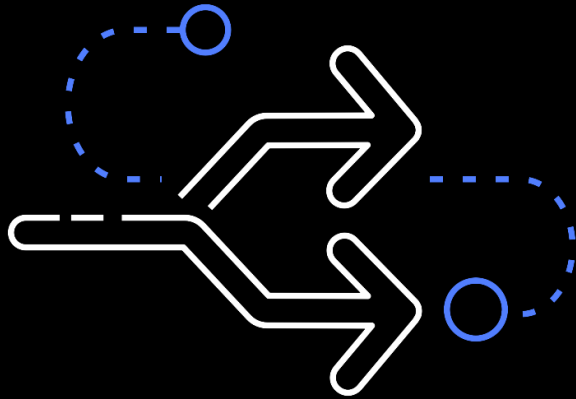


Easy deployment to
production REST API

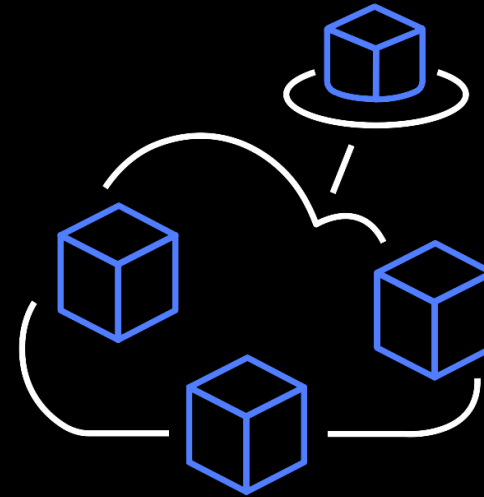


Scalable, high
throughput, and high
reliability

Create And Manage Endpoints Easily

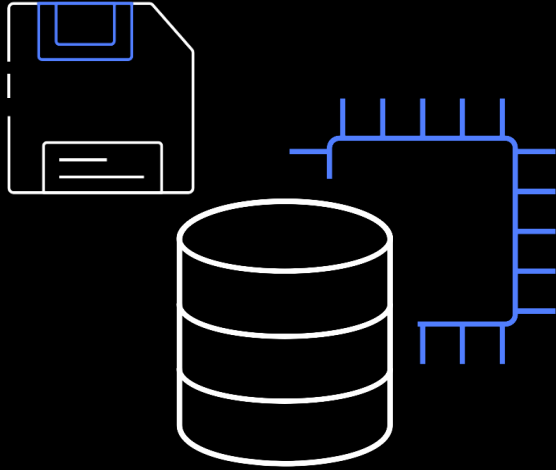


Blue-green
deployments means
no scheduled
downtime



Deploy one or more
models behind the
same endpoint

Create And Manage Endpoints Easily



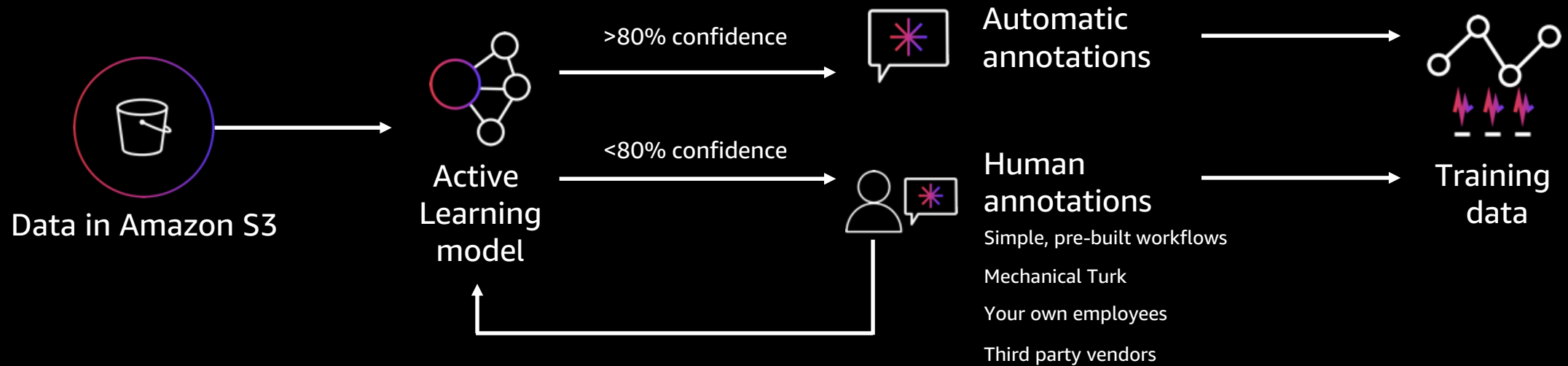
Algorithms have
different memory,
CPU, or GPU
requirements



Autoscale based on
endpoint instance's
Amazon CloudWatch
Metrics

Amazon SageMaker – Ground Truth

Build highly accurate training datasets and reduce data labeling costs by up to 70% using Machine Learning



AWS Marketplace For Machine Learning

Over a hundred algorithms and models that can be deployed directly to Amazon SageMaker



Browse or search
AWS Marketplace



Subscribe
in a single click



Available through
Amazon SageMaker

Selling algorithms &
models on AWS
Marketplace



Package algorithm, models and configuration



Register with AWS Marketplace



Automatic validation on Amazon SageMaker



Self-service listing on AWS Marketplace

Natural Language Processing

Grammar and Parsing

Computer Vision

Named Entity Recognition

Speech Recognition

Text to Speech

Text Classification

3D Images

Text Clustering

Handwriting Recognition

Text Generation

Object Detection in Images

Regression

Ranking

Text OCR

Speaker Identification

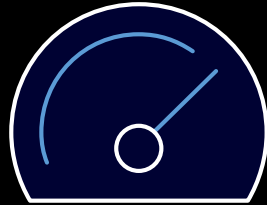
Video Classification

Anomaly Detection

Amazon SageMaker Neo Train Once, Run Anywhere



Get accuracy
and performance



Automatic
optimization



Broad framework
support



Broad hardware
support

KEY FEATURES

Compiler & run-time are open source

1/10th the size of original models

Using Amazon SageMaker, GE Healthcare developed an ML model that can learn from thousands of medical scans to detect anomalies more accurately and efficiently, allowing radiologists to prioritize patients needing immediate attention



GE Healthcare

One week of NFL games now
creates 3TB of data

NFL uses Amazon SageMaker
to analyze telemetry data to
predict plays

Computations that could take
months to refine now take only
weeks or days



Using TensorFlow on Amazon SageMaker, Siemens Financial Services developed an NLP model to extract critical information to accelerate investment due diligence, reducing time to summarize diligence documents from 12 hours down to 30 seconds



SIEMENS

Conclusion

- Amazon SageMaker is a versatile platform to build, train, and deploy machine learning models at scale.
- Customers like the NFL are benefiting from integrating Amazon SageMaker into their delivery pipelines.
- Explore Amazon SageMaker (free tier eligible*) and build models of your own.
- And yes, No Machine Learning Experience required to get started!

*<https://aws.amazon.com/free/>

Learn why customers choose AWS for machine learning



Demo Arena

Watch how machine learning is used in real life applications



Ask the Experts

Get your questions answered by AWS Experts



Machine Learning on AWS

<https://aws.amazon.com/machine-learning/>

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