Amazon SageMaker

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AWS re:Invent

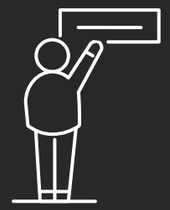
aws

Machine Learning is Hard

Collect and prepare training data

Choose and optimize your ML algorithm

Set up and manage environments for training

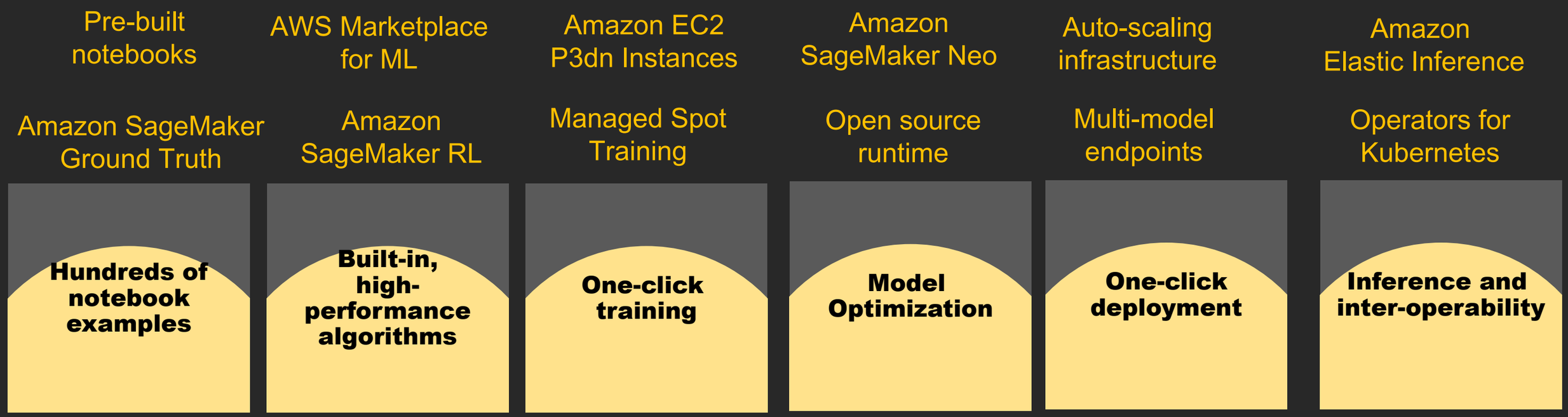


Train and Tune ML Models

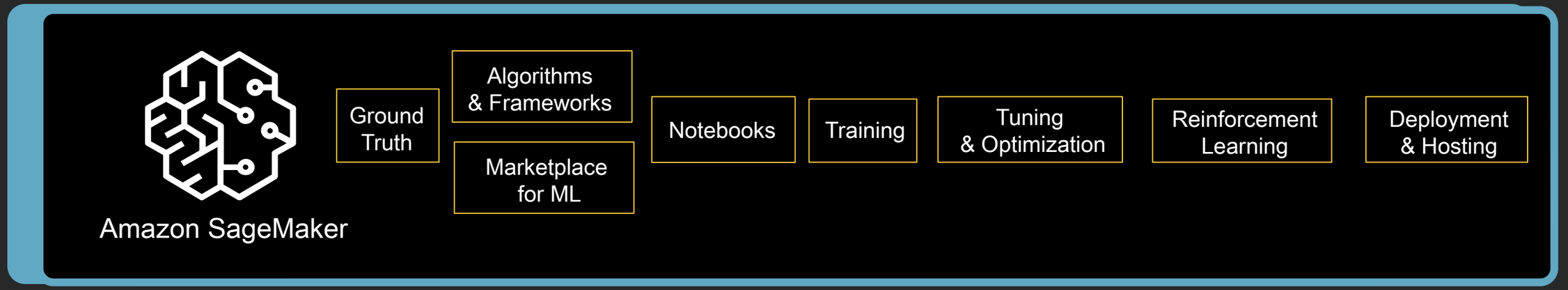
Deploy models in production

Scale and manage the production environment

Amazon SageMaker
Getting models from concept to production



Build, Train, Deploy Machine Learning Models Quickly at Scale



Machine learning is iterative involving dozens of tools and hundreds of iterations

Multiple tools needed for different phases of ML process

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Lack of an integrated experience

+

Large number of iterations

=

Cumbersome, lengthy processes,, resulting in loss of productivity to get ML solutions to address business requirements

NEW

Introducing Amazon SageMaker Studio

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

Collaboration at scale

Share scalable notebooks without tracking code dependencies

Easy experiment management

Organize, track, and compare thousands of experiments

Automatic model generation

Get accurate models for with full visibility & control without writing code

Higher quality ML models

Automatically debug errors, monitor models, & maintain high quality

Increased productivity

Code, build, train, deploy, & monitor in a unified visual interface

Sharing data science and the burden of setting up and managing resources

Setup and manage resources

+

Code dependencies for collaboration

+

Lack of IDE for large data science teams

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Reproducing and building on existing work is a significant time sink

NEW

Introducing a new Amazon SageMaker notebook experience

Setup free notebooks for collaboration at scale

Easy access with single sign-on

Access your notebooks in seconds with SSO

No setup of resources

Start your notebooks without spinning up compute

Full managed and secure

Administrators manage access and permissions

Collaboration at scale

Share with peers as a URL with a single click

Scale on the go

Scale up your notebooks without restart

Debugging and profiling deep learning is painful

Large neural networks
with many layers

+

Many connections

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Additional tooling for analysis
and debug

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Extraordinarily difficult
to inspect, debug, and profile
the ‘black box’

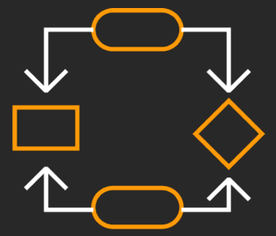
NEW

Introducing Amazon SageMaker Debugger

Analysis & debugging, explainability, and alert generation

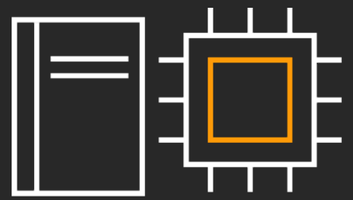
Relevant data capture

Data is automatically captured for analysis



Automatic data analysis

Debug data with no code changes



Automatic error detection

Errors are automatically detected based on rules

Improved productivity with alerts

Alerts are sent with violations, to take action

Visual analysis and debug

Visually analyze & debug from SageMaker Studio

Managing trials and experiments is cumbersome

Hundreds of experiments

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Hundreds of parameters per experiment

+

Compare and contrast

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Very cumbersome and error prone

NEW

Introducing Amazon SageMaker Experiments

A system to organize, track, and evaluate training experiments

Experiment tracking at scale

Track parameters & metrics across experiments & users

Organize experiments

Organize by teams, goals, & hypotheses

Visualization for best results

Visualize & compare between experiments

Flexibility with Python SDK & APIs

Log custom metrics & track models using APIs

Iterate quickly

Iterate & develop high-quality models

Deploying a model is not the end, you need to continuously monitor it in production and iterate

Concept drift due to divergence of data

+

Model performance can change due to unknown factors

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Continuous monitoring of model performance and data involves a lot of effort and expense

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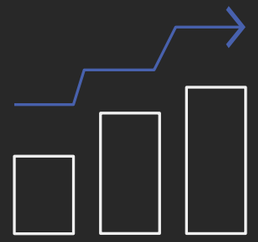
Model monitoring is cumbersome but critical

NEW

Introducing Amazon SageMaker Model Monitor
Continuous monitoring for deployed models

Automatic data collection

ata is automatically collected from endpoints



Visual data analysis

Data is analyzed based on built-in rules or custom rules

Higher model quality

Model quality is monitored and alerts are sent for deviations in quality

CloudWatch Integration

Act on emitted metrics on Amazon CloudWatch

Flexibility with rules

Use built-in rules or custom rules for monitorin

Successful ML requires complex, hard to discover combinations

of algorithms, data, parameters

Largely explorative & iterative

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Requires broad and complete knowledge of ML domain

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Lack of visibility

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Time consuming, error prone process even for ML experts

NEW

Introducing Amazon SageMaker Autopilot
Automatic model creation with full visibility & control

Quick to start

Provide your data in a tabular form & specify target prediction

Automatic model creation

Feature engineering & automatic model tuning are automatically done

Transparency

Get the model notebook with source code

Recommendations & Optimization

Get recommendations on a leaderboard & continue to better your model

Build, Train, Deploy Machine Learning Models Quickly at Scale

Getting started

http://aws.amazon.com/free

https://aws.amazon.com/sagemaker

https://github.com/aws/sagemaker-python-sdk

https://sagemaker.readthedocs.io/

https://github.com/awslabs/amazon-sagemaker-examples

https://youtube.com/juliensimonfr

https://medium.com/@julsimon