AWS re:Invent

MKT205-R

Build a machine learning model using a third-party algorithm

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Senior Solutions Architect

AWS Marketplace for machine learning

Amazon Web Services

AWS re:Invent

aws

Agenda

Prerequisites: AWS account

Overview and introduction

Start lab

- Subscribe to the algorithm from AWS Marketplace
- Create an Amazon SageMaker notebook instance

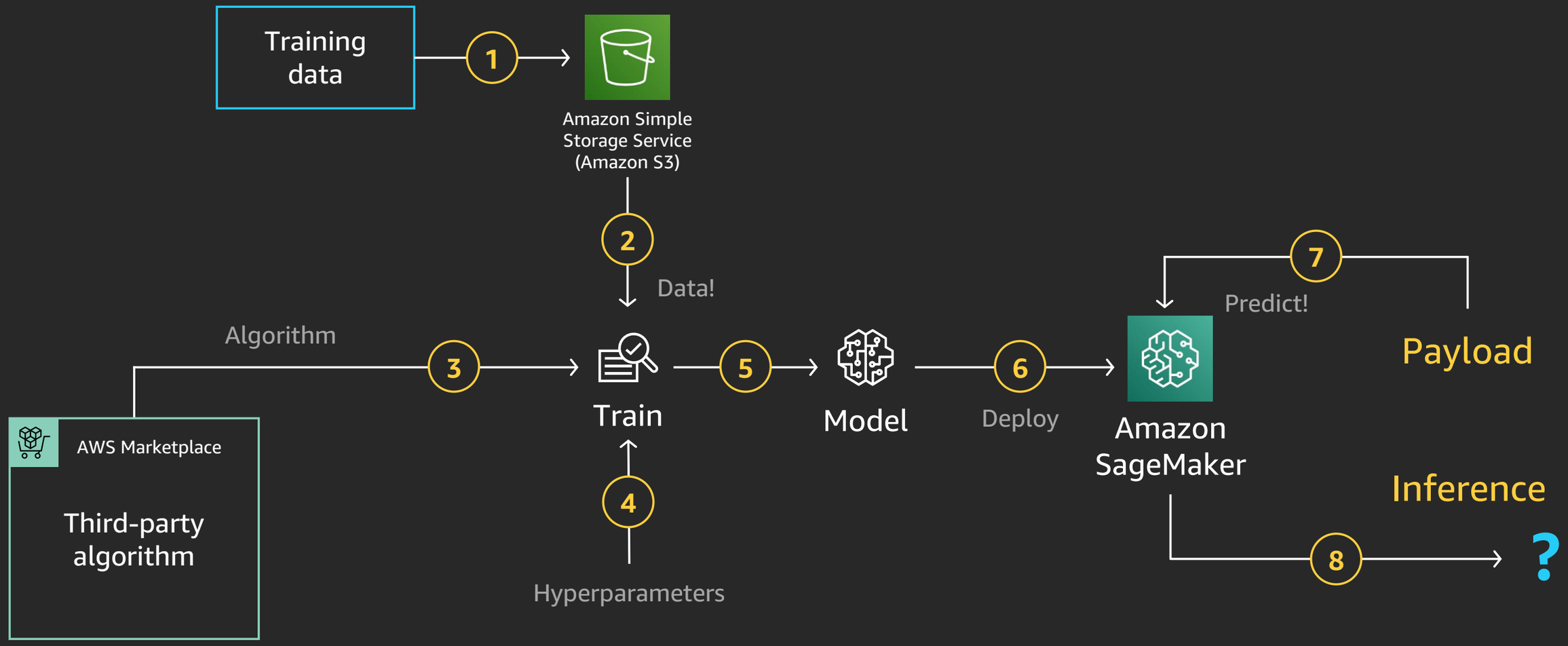
Run sample notebook

How does AWS Marketplace support machine learning (ML) workloads? (2 minutes)

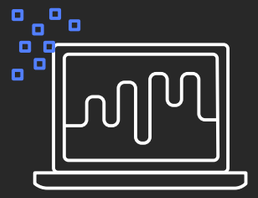
Overview: AWS Marketplace for ML

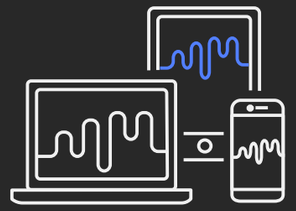
Lab and Q&A

Train a ML model



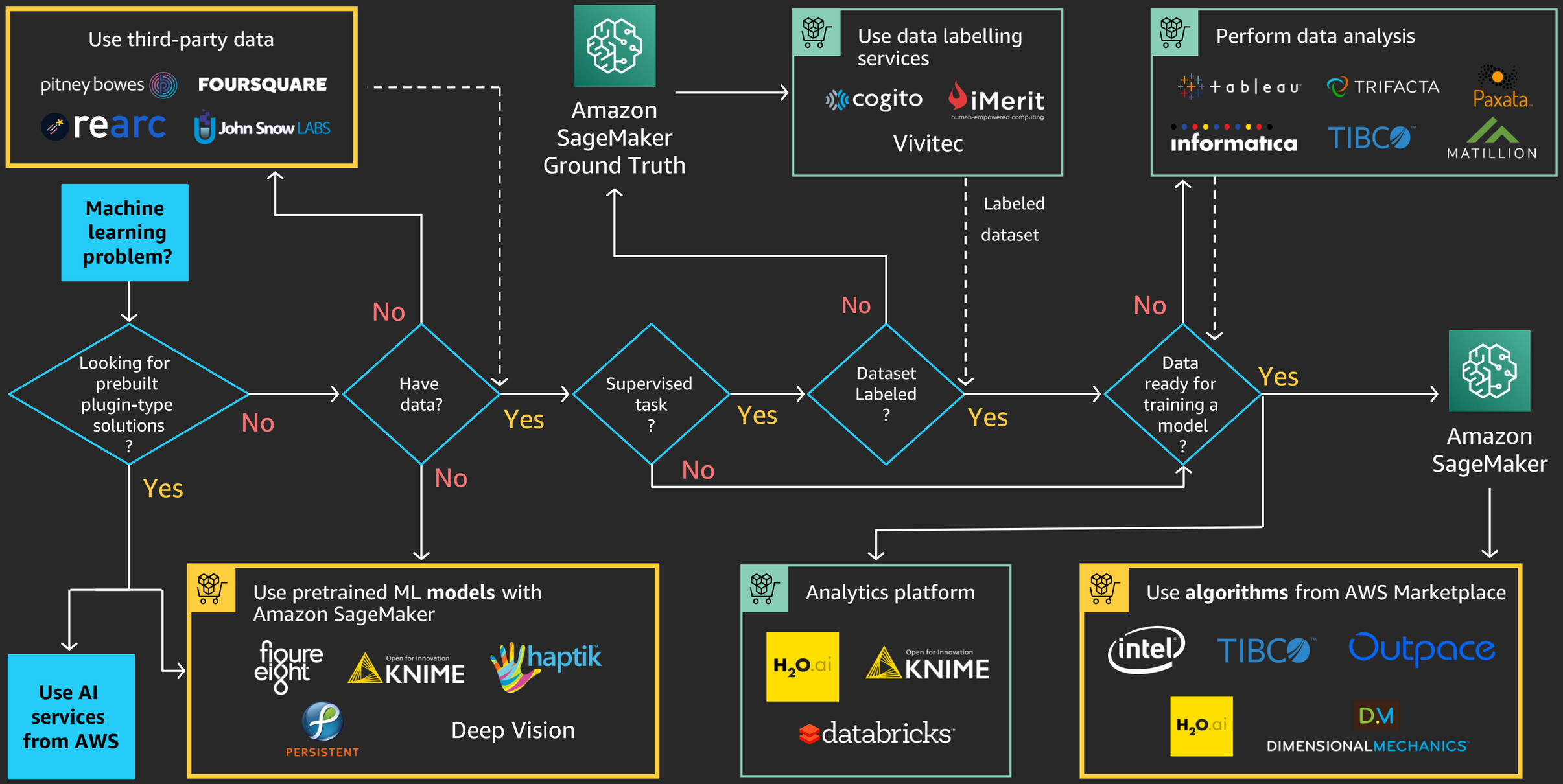
Task: Train a model using an algorithm from AWS Marketplace





Amazon SageMaker

1. Identify algorithm from Amazon SageMaker console
2. Subscribe
3. Train a model using Amazon SageMaker
4. Run batch transform job
   Perform real-time inference


Use third-party data
pitney bowes
FOURSQUARE
rearc
John Snow LABS
Amazon SageMaker Ground Truth
Use data labelling services
cogito
iMerit
human-empowered computing
Vivitec
Perform data analysis
+ableau
TRIFACTA
Paxata
informatica
TIBCO
MATILLION
Machine learning problem?
Looking for prebuilt plugin-type solutions ?
No
Have data?
No
Yes
Supervised task ?
Yes
No
Dataset Labeled ?
Yes
No
Labeled dataset
Data ready for training a model ?
Yes
No
Amazon SageMaker
Yes
Use AI services from AWS
Use pretrained ML models with Amazon SageMaker
figure eight
Open for Innovation KNIME
haptik
PERSISTENT
Deep Vision
Analytics platform
H2O.ai
Open for Innovation KNIME
databricks
Use algorithms from AWS Marketplace
intel
TIBCO
Outpace
H2O.ai
D.M
DIMENSIONALMECHANICS

AWS Marketplace for ML

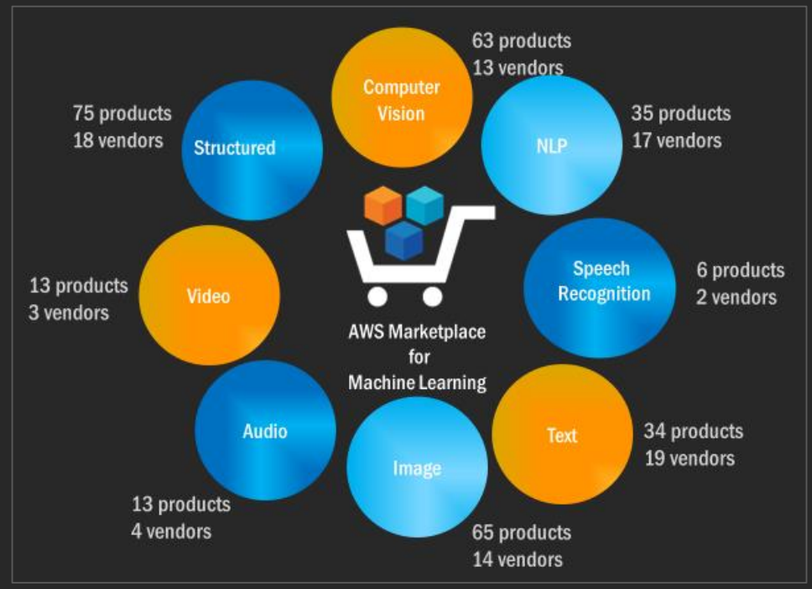
Amazon SageMaker

Curated and trusted catalog of over **250 ML model packages** and **algorithms**

- **14** Industry segments
- **40** Partners

Simple software provisioning from AWS Marketplace

- Consolidated into your AWS billing
- Free | Free trial | Paid subscriptions



H2O.ai · Open for Innovation KNIME · intel · figure eight · Knowledgent · D.M DIMENSIONALMECHANICS · wipro · TIBCO

Find, buy, and use pretrained models or algorithms on Amazon SageMaker

Model packages in AWS Marketplace

Amazon SageMaker

Perform inference

Identify make and model of the car

Generate synthetic features

Extract additional features from images and improve recommendations

Identify high-quality data

Identify and remove audio files with background noise

ML algorithms in AWS Marketplace

Can I train/tune a model?

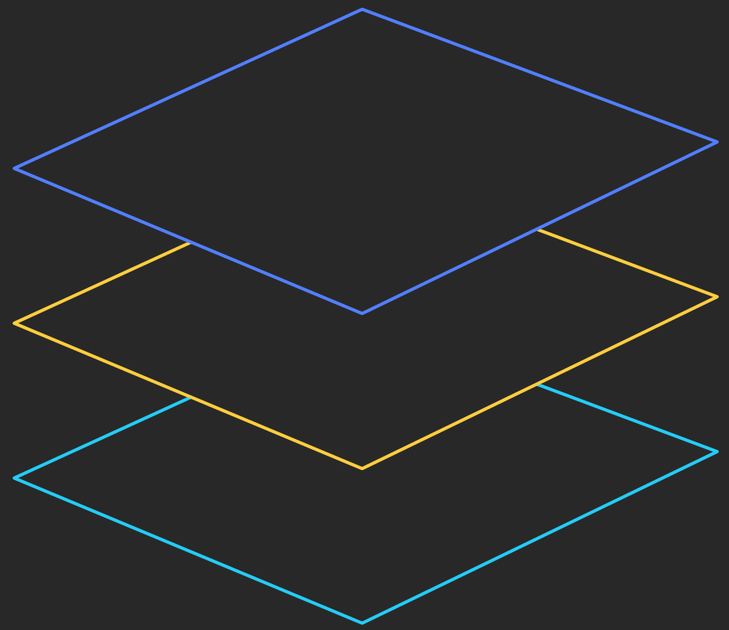
Yes!

How's the experience?

Much like Amazon SageMaker built-in algorithms

What do I need to know?

AWS Marketplace algorithm code is not visible to buyer



AWS Marketplace algorithms

Prediction problem	Amazon SageMaker built-in		AWS Marketplace
Classification	• Linear learner • XGBoost • K-nearest neighbors (K-nn) • Factorization machines	+	• Dense Random Forest classification • Sparse Random Forest classification • H2O.ai H2O-3 Automl algorithm • H2O.ai H2O-3 GBM algorithm • Sparse Gradient Boosting classification • Dense Gradient Boosting classification • Intel® DAAL k-Nearest Neighbors • H2O.ai's H2O-3 deep learning algorithm • Sparse logistic regression
Regression	• Linear learner • XGBoost • K-nn	+	• Dense Random Forest regression • Sparse Random Forests regression • Dense Gradient Boosting regression • Sparse Gradient Boosting for regression • H2O.ai H2O-3 GBM algorithm • H2O.ai's H2O-3 Deep learning algorithm
Anomaly detection (Is the behavior normal?)	• IP insights • Random Cut Forests	+	• Bigfinite OutlierDetection • Autoencoder for anomaly detection

AWS Marketplace algorithms

Prediction problem	Amazon SageMaker built-in		AWS Marketplace
Computer vision	• Image classification <> • Object detection <> • Semantic segmentation	+	• Batch image/video object detection • Image/video embeddings using SVD • Automatic video/image recognition • Automatic video recognition and tagging • Action/sport recognition in video • Image/video face recognition • Automatic image tagging • Batch object detection
Recommendation	• Factorization machines	+	• Implicit alternating least squares • Implicit BPR • Spotlight implicit sequence/factorization • Spotlight explicit factorization
Reinforcement learning	• Amazon SageMaker RL	+	• Multi-armed bandits & Thompson sampling • Game tweaks • Sustainable dynamic pricing

AWS Marketplace algorithms

Prediction problem	Amazon SageMaker built-in		AWS Marketplace
Forecasting	• DeepAR	+	• Demand forecasting for intermittent data • Demand forecasting for frequent data • Demand intermittency classifier
Feature reduction	• PCA • Object2Vec	+	• Intel® DAAL PCA • Sparse singular value decomposition
Working with text	• Blazing text • Supervised • Unsupervised	+	• Cognitive QnA • Novetta Text Tagger • Text similarity analyzer

And many more..

Prediction problem	Custom algorithms from AWS Marketplace
Time-series clustering	• K-Shape: Time series clustering
Segmentation	• Customer segmentation
Churn classification	• Non-contractual churn classification
QnA	• Cognitive QnA algorithm

Working session

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Thank you!

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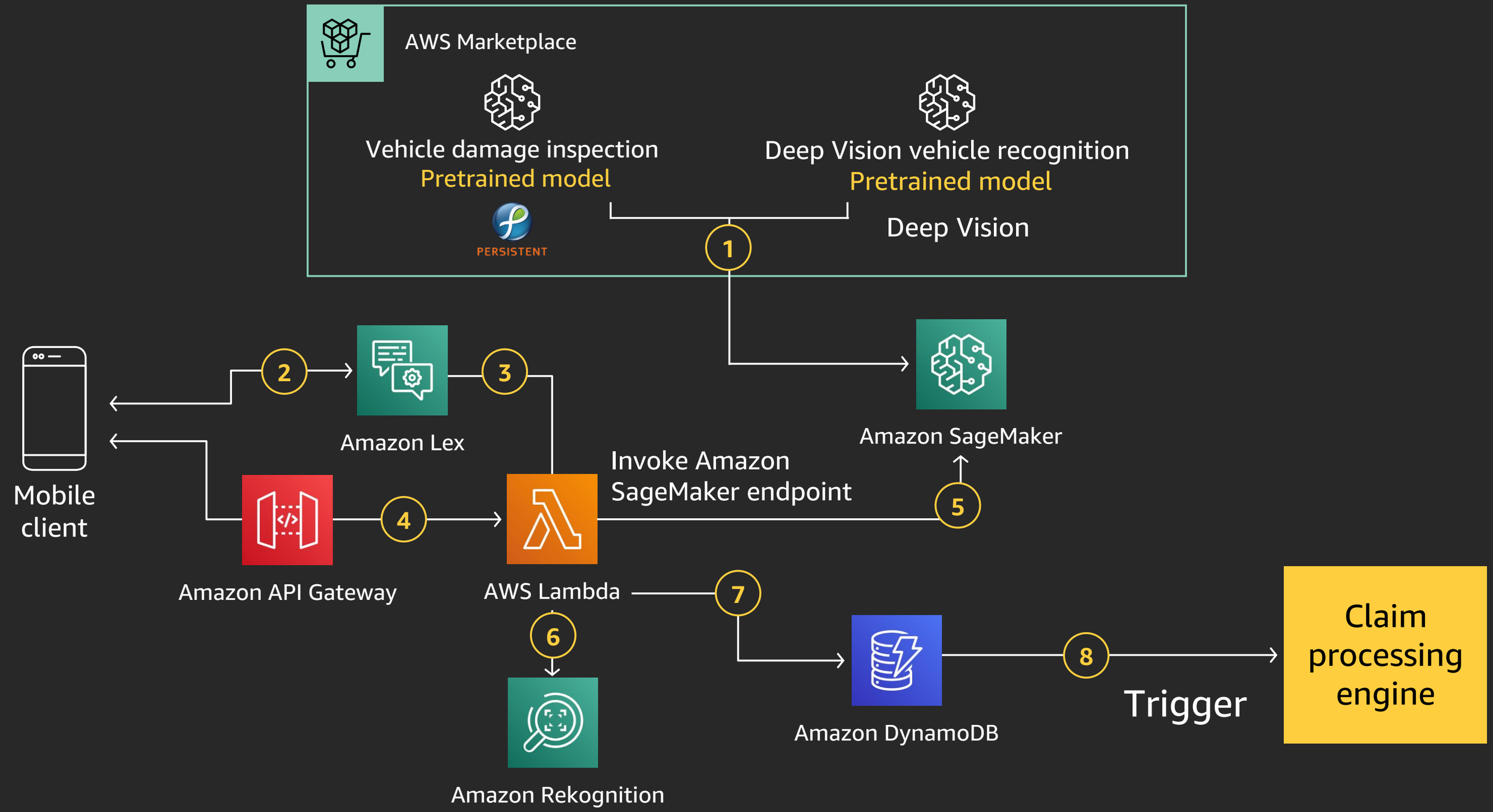
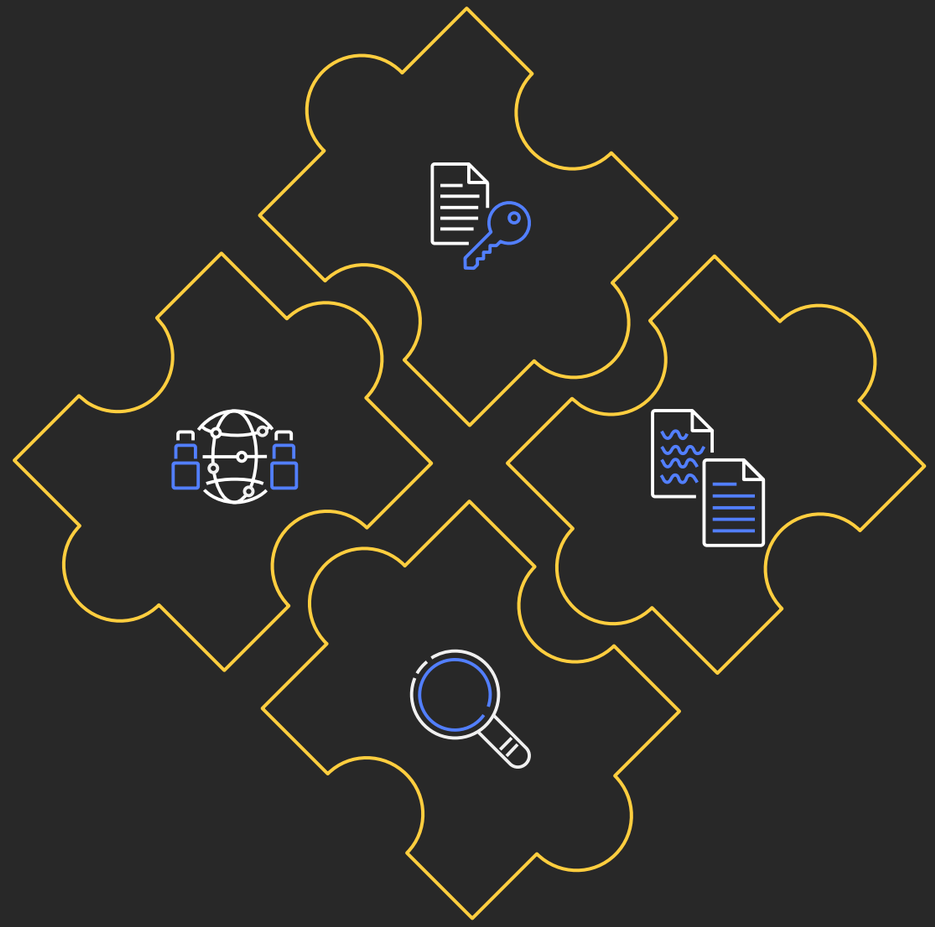
Please complete the session survey in the mobile app.

Appendix


AWS Marketplace
Vehicle damage inspection
Pretrained model
PERSISTENT
Deep Vision vehicle recognition
Pretrained model
Deep Vision
1
Amazon SageMaker
2
Amazon Lex
3
Mobile client
Invoke Amazon SageMaker endpoint
5
4
Amazon API Gateway
AWS Lambda
7
6
Amazon Rekognition
Amazon DynamoDB
8
Trigger
Claim processing engine

Security



IAM policies

Private AWS Marketplace

AWS Service Catalog

Amazon SageMaker

Prebuilt notebooks for common problems

Collect and prepare training data

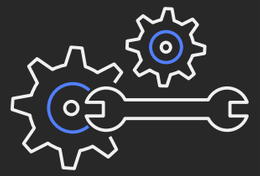
Built-in, high-performance algorithms

Choose and optimize your ML algorithm

One-click training

Set up and manage environments for training

Optimization



Train and tune model (trial and error)

One-click deployment

Deploy model in production

Fully managed with auto-scaling, health checks, automatic handling of node failures, and security checks

Scale and manage the production environment

Procure ML **algorithm** from AWS Marketplace

Deploy ML **model package** from AWS Marketplace

Media and entertainment and retail applications using computer vision

Use cases

Media and entertainment

- **Track brand air time**—how long a logo was in the game
- Add searchable information to index video content archive
- **Activity detection**

Retail

- **Visual product search—**Convert images into product search tag, brands
- Recommendation
- **Emerging trends—**Tagging brands, products detected in images
- Website product listing quality—Detect watermark or text, moderate unsafe content, celebrity picture detection

Computer vision ML models

- Deep Vision brand recognition API
- Sensifai Logo Recognition in Images
- Cortexica Fashion Localization
- Cortexica Interior Localization
- Deep Vision visual search API
- Deep Vision context recognition API
- Cortexica Person Detector
- Deep Vision face recognition API
- ViSenze Image collage classifier
- ViSenze Image detail classifier
- ViSenze Image text classifier
- Category Recommendation Inference Model
- ViSenze Image human classifier
- ViSenze Image mosaic classifier
- Face Anonymizer
- RocketML Face blurring for Privacy
- Cortexica BodyParts Localizer
- RocketML Barcode Detection
- NSFW Content Recognition in Images
- NSFW Content Recognition in Videos
- Celebrity Recognition in Images
- Celebrity Recognition in Videos
- RocketML Credit Card detection

Compliance, insurance, and industrial IoT applications using ML

Use cases

Compliance

- **Know your customer**—Verification checks at scale
- **Worker safety**—protective gear

Insurance

- **Insurance claim** processing automation
- Insurance claim predictor

IoT

- Industrial **asset utilization**
- **Preventive maintenance**

ML models

- Passport Data Page Detection
- Passport Stamp Detection
- Persistent Vehicle damage inspection
- RocketML Vehicle Attribute Detection
- Parking Lot Occupancy Identification
- Deep Vision vehicle recognition
- indus.ai Construction Machines Detector
- Agmis Construction Worker Detection
- Provectus Hard Hat Detector for Worker Safety
- Agmis Personal Protective Equipment
- Mphasis HyperGraf Auto Claims Prediction
- RocketML Person Attribute detection
- Construction Worker Protective Equipment Detection
- Welding classification
- Person and Truck Segmentation
- Modjoul Geo Fence Model
- Modjoul Asset Utilization Model
- Modjoul Stationary Work Model
- Modjoul Walking Model
- Modjoul Motion Model
- Ball Bearings Quality Inspection
- Mphasis DeepInsights Truck Vol Estimate
- Modjoul Automotive Telematics Model

Customer support, content curation, and cyber security using natural language processing

Use cases

Cyber security and filtering

- **Security threat intelligence**—Phishing
- **Web filtering**—Content control

Customer support

- **Domain specific chatbot** (intent matching) e.g., legal, HR
- **Regulatory compliance**—Ethical and caring treatment of consumers facing difficulty
- **Basic sentiment predictor**—Airline reviews

Content curation

- **Classify text** into domain specific categories
- Text summarizer

ML models

- Demisto Phishing Email Classifier
- Abusive Text Content Detection
- Text Similarity
- Named Entity Recognition
- LexisNexis US Legal Taxonomy—Level 1
- Word Associations Inference Model
- Sentiment Analysis Inference Model
- Mphasis DeepInsights Behavioral AI
- Topic Tagging Inference Model
- Novetta Text Tagger
- Insult detection
- Emotion Analysis Inference Model
- Banking FAQ Intent Matching
- Review Helpfulness Prediction
- Lemmatizer Inference Model
- Text Similarity Inference Model
- Text Similarity Analyzer
- Language Scoring Inference Model
- Lyrics Generator (CPU)
- Neural Paraphrase Generation
- Novetta News Tagger (Foreign Policy)
- Novetta News Tagger (Humanitarian)
- Wipro HOLMES™ E-KYC Controller Extractor
- Sentiment Analysis