ML at Amazon

Investments in ML for more than 20 years.
Thousands of engineers focused on ML.
More ML is built on AWS than anywhere else.
Our vision: “Put machine learning in the hands of every developer and data scientist”
The AWS Machine Learning Stack

**APPLICATION SERVICES**
- REKOGNITION
- REKOGNITION VIDEO
- POLLY
- LEX
- TRANSCRIBE
- TRANSLATE
- COMPREHEND

**PLATFORMS**
- Amazon SageMaker
- Amazon Mechanical Turk

**FRAMEWORKS & INFRASTRUCTURE**
- Caffe2
- CNTK
- mxnet
- PyTorch
- TensorFlow
- Keras
- Gluon

- **P3**
  - NVIDIA Tesla V100 GPUs
  - 5,120 Tensor cores
  - 1 Petaflop of compute
  - 128GB of memory
  - NVLink 2.0
  - Machine Learning AMIs

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Machine Learning Use Cases
Sample ML Use Cases Across Key Media Workloads

**Content Creation & Post Production**
- Automated highlights creation
- Pre-processing and optimization
- Dailies/editorial review
- Application & filesystem texture and asset search
- B-roll and false take tagging

**Digital Asset Management & Supply Chain**
- Tag on ingest
- Live and VOD feature extraction
- Celebrity detection
- Auto-categorization
- Metadata augmentation
- Logo/brand detection
- Activity Pathing
- Close captioning
- Automated captioning and translation
- Automated Compliance Marking
- Automated IP protection
- Performance optimization

**Publishing & Distribution**
- Ad personalization
- Content recommendation
- Filtering and quality control
- Translate services
- Audience engagement
- Demographics and sentiment analysis
- Anti-piracy
metadata generation

Contact AWS Sales or kuthan@amazon.com if you are interested in this use case and want to see the demo.
The Royal Wedding

The ROYAL WEDDING

WHO'S WHO?

WATCH NOW

Arrivals will appear here

PROFILES

Select an arrival card for more info on the guest.
The Royal Wedding
Subtitle Generation and Translation

Creating Subtitles and Translations Using Amazon Services:

Amazon Transcribe
Amazon Translate
Amazon Polly

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INFRASTRUCTURE
- P3
  - NVIDIA Tesla V100 GPUs
    (14x faster than P2)
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Media Analysis Solution demo

This solution leverages Amazon-native serverless services to automatically analyze, extract, index, and search on valuable metadata from your own image, video, and audio files.

Getting Started

1. Upload video, audio, or image file in the 'Upload' tab
2. Browse for uploaded media files in the 'Browse' tab and click to view results
3. View and highlight labels, faces, persons, celebrities, known faces, transcripts, phrases, and entities in the result page

Architecture

Contact AWS Sales or kuthan@amazon.com if you are interested in this use case and want to see the demo.
Custom Model
Media Analysis Solution

Machine Learning Services

Automated Metadata Generation
- Label & Face Detection
- Celebrity Detection
- Face Search
- Activity Tracking

Transcription
- Subtitle generation

Context
- Key Entity & Phrase Detection
- + upcoming expansions

+ additional solutions for media use cases

Go To aws.amazon.com > answers > media-entertainment > Media-Analysis-Solution

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Media Analysis Solution architecture
Use-Case: National Football League

**Background**
- The NFL is America’s largest sport organization with 180 million fans worldwide
- Big content creator, created 15 of the top 20 broadcasts in the US in 2017 alone
- Generate 3 TB of data within every game week

**Challenge**
- Evolve manually tracked and generated basic stats and start generating stats automatically
- Provide real-time data in <1 second
- Develop new ways of visualizing the action on the field
- Uncover deeper insights into the action on the field
- Expand the fan experience by offering a broader range of advanced statistics

**Solution**

<table>
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<th>DATA CAPTURE</th>
<th>NEXT GEN STATS PLATFORM ON AWS</th>
<th>END USERS</th>
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<td>CAPTURE PROCESS</td>
<td>COACHING OFFICIATING</td>
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<td>IN-STADIUM</td>
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**Results**

**Taking Next Gen Stats to the Next Level with ML**
- Formation recognition
- Route recognition
- Identifying key events
Use-Case: C-SPAN

Background

- Over 200,000 hours of content
- Only half of content is manually tagged
- How can we enrich our metadata in AWS?
- How can we unleash the value of content we already own once in AWS?

Challenge

- Large scale video library
- High accuracy required
- Limited budget
- Ability to extract from video
- Keep up with daily increase in content

Results

- Solution developed within three weeks
- Live video frame based analysis
- Established, searchable baseline archive
- All content is now tagged and indexed
- Over 99,000 faced indexed and searchable
- Saved ~9,000 hours a year in manual curation costs

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# Amazon ML Lab

Lots of companies doing Machine Learning

<table>
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<th><strong>Lack ML expertise</strong></th>
<th><strong>Unable to unlock business potential</strong></th>
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Amazon ML Lab provides the missing ML expertise

Leverage Amazon experts with decades of ML experience with technologies like Amazon Echo, Amazon Alexa, Prime Air and Amazon Go

- Brainstorming
- Modeling
- Teaching
Thank You and Build On!