

AWS MACHINE LEARNING CERTIFICATION



DOMAIN #3: MODELING (36% EXAM)



AWS ML CERTIFICATION EXAM DOMAINS



Domain	% of Examination
Domain 1: Data Engineering	20%
Domain 2: Exploratory Data Analysis	24%
Domain 3: Modeling	36%
Domain 4: Machine Learning Implementation and Operations	20%
TOTAL	100%

Source: [https://d1.awsstatic.com/training-and-certification/docs-ml/AWS%20Certified%20Machine%20Learning%20-%20Specialty_Exam%20Guide%20\(1\).pdf](https://d1.awsstatic.com/training-and-certification/docs-ml/AWS%20Certified%20Machine%20Learning%20-%20Specialty_Exam%20Guide%20(1).pdf)



DOMAIN #3 OVERVIEW:

SECTION #8: MACHINE AND DEEP LEARNING BASICS – PART #1

- Artificial Neural Networks Basics: Single Neuron Model
- Activation Functions
- Multi-Layer Perceptron Model
- How do Artificial Neural Networks Train?
- ANN Parameters Tuning – Learning rate and batch size
- Tensorflow playground
- Gradient Descent and Backpropagation
- Overfitting and Under fitting
- How to overcome overfitting?
- Bias Variance Trade-off
- L1 Regularization
- L2 Regularization

SECTION #9: MACHINE AND DEEP LEARNING BASICS – PART #2

- Artificial Neural Networks Architectures
- Convolutional Neural Networks
- Recurrent Neural Networks
- Vanishing Gradient Problem
- LSTM Networks
- Model Performance Assessment – Confusion Matrix
- Model Performance Assessment – Precision, recall, F1-score
- Model Performance Assessment – ROC, AUC, Heatmap, and RMSE
- K-Fold Cross validation
- Transfer Learning
- Ensemble Learning – Bagging and Boosting

DOMAIN #3 OVERVIEW:



SECTION #10: MACHINE AND DEEP LEARNING IN AWS – BUILT-IN ALGORITHMS PART #1

- AWS SageMaker
- Deep Learning on AWS
- SageMaker Built-in algorithms
- Object Detection
- Image Classification
- Semantic Segmentation
- SageMaker Linear Learner
- Factorization Machines
- XG-Boost
- SageMaker Seq2Seq
- SageMaker DeepAR
- SageMaker Blazing Text

SECTION #11: MACHINE AND DEEP LEARNING IN AWS – BUILT-IN ALGORITHMS PART #2

- Random Cut Forest
- Neural Topic Model
- LDA
- K-Nearest Neighbours (KNN)
- K Means
- Principal Component Analysis (PCA)
- IP insights
- Reinforcement Learning
- Object2Vec
- Automatic Model Tuning
- SageMaker and Spark



DOMAIN #3 OVERVIEW:



SECTION #12: MACHINE AND DEEP LEARNING IN AWS – HIGH LEVEL AI/ML PART #3

- ReKognition
- Amazon Comprehend and Comprehend Medical
- Translate
- Transcribe
- Polly
- Forecast
- Lex
- Personalize
- Textract
- AWS DeepLens
- AWS DeepRacer

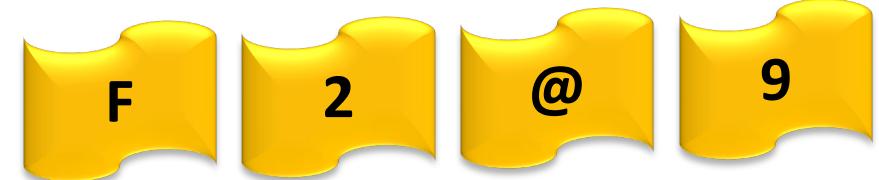


WE ARE HERE!

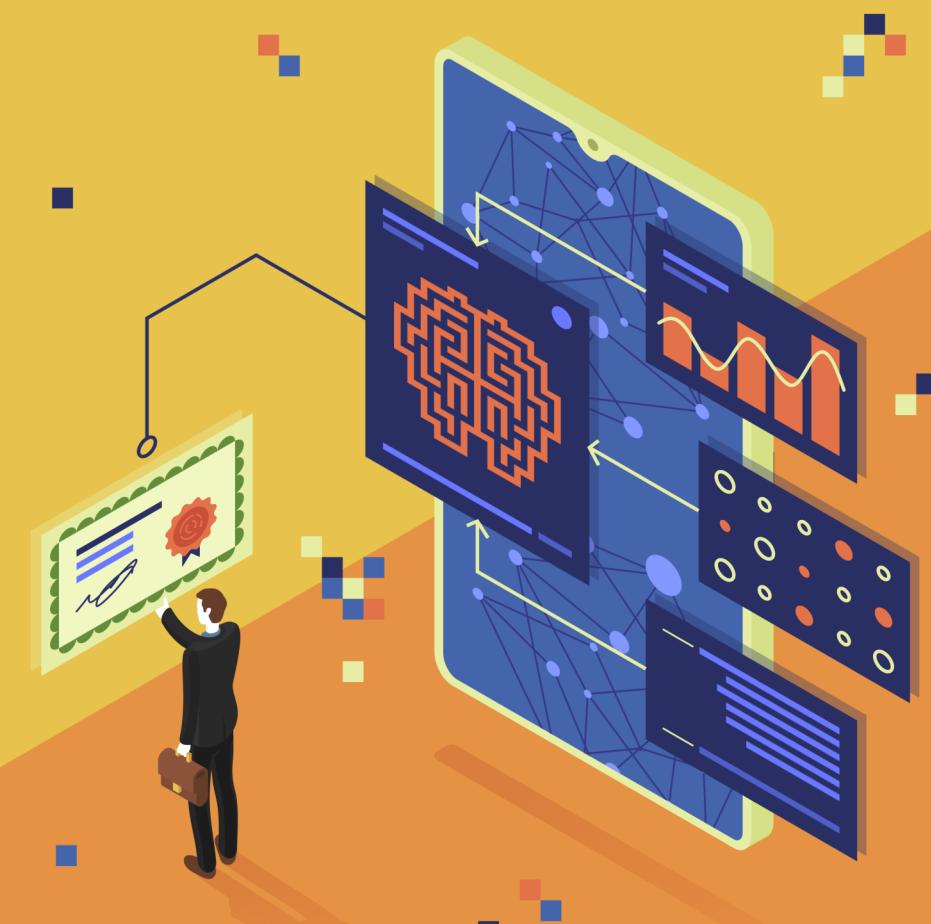
RECALL OUR MINI CHALLENGE AND PRIZE!



- For those of you who will successfully complete the entire section and watch the videos till the end, they will receive a valuable prize!



AMAZON AI/ML SERVICES



AMAZON AI/ML SERVICES



- SageMaker Algorithms presented so far require some level of programming skills to build, train and deploy AI/ML models.
- Besides that, Amazon offers a list of AI/ML services that DO NOT require any programming skills at all!!
- These are pre-trained AI services that could do the following:
 - Computer vision
 - Natural Language
 - Recommendations
 - Forecasting

The screenshot shows the AWS navigation bar with links for Products, Solutions, Pricing, Documentation, Learn, Partner Network, AWS Marketplace, Customer Enablement, Events, Explore More, and a search bar. The "AI/ML Services" dropdown menu is open, showing a list of services: Amazon Comprehend, Amazon Elastic Inference, Amazon Forecast, Amazon Lex, Amazon Personalize, Amazon Polly, Amazon Rekognition, Amazon SageMaker, Ground Truth, Amazon SageMaker Neo, Amazon Textract, Amazon Transcribe, Amazon Translate, AWS Deep Learning AMIs, AWS DeepLens, and AWS DeepRacer. The main content area features the Amazon SageMaker logo and a sub-headline "Machine learning for every developer". Below this is a "Get Started with Amazon SageMaker" button and a detailed description of the service's capabilities. To the right is a large, abstract network graph visualization.

YOUTUBE VIDEO COVERING 5 HIGHLEVEL AI/ML SERVICES



https://www.youtube.com/watch?v=pwKMW_fiv-Y&t=1s



AMAZON REKOGNITION



AMAZON REKOGNITION: OVERVIEW

- Amazon Rekognition allows for video and image analysis by detecting objects, people, text and scenes.
- Amazon recognition does not require any machine learning expertise!
- It is based on advanced deep learning technology that learns every day as more data becomes available.
- Simply upload a video or image to Amazon S3 and analyze it using Amazon Rekognition.
- It could also provide:
 - Facial recognition/Facial analysis
 - Celebrity recognition
 - Face comparison
 - Text detection in image
- Facial recognition performance depends on lighting and resolution
- Video streams comes from Kinesis Video Streams H.264 encoded 5-30 FPS

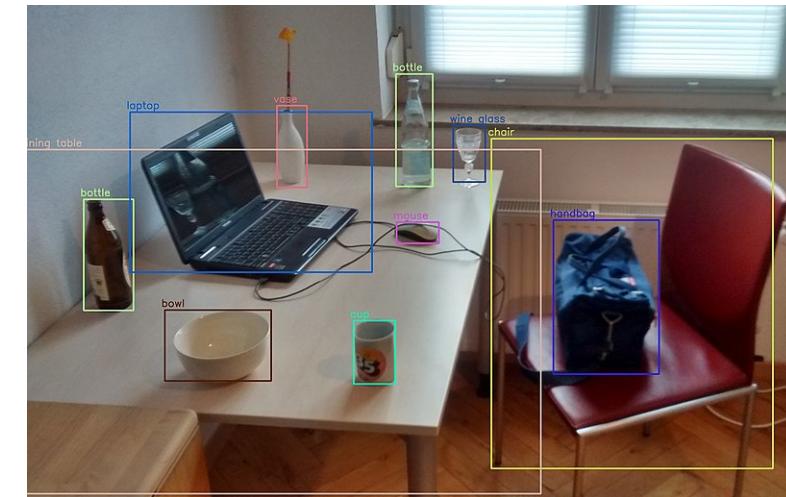


Photo Credit: <https://commons.wikimedia.org/wiki/File:Detected-with-YOLO--Schreibtisch-mit-Objekten.jpg>
Photo Credit: https://uk.wikipedia.org/wiki/%D0%A4%D0%B0%D0%B9%D0%BB:Face_detection.jpg

AMAZON RECOGNITION: FEATURES



EASY INTEGRATION

- Easy and simple API.

IMPROVING PERFORMANCE EVERYDAY!

- Learning, growing and becoming better as more data becomes available.

NO MANAGEMENT/HASSLE

- Amazon Rekognition can support millions of request with minimum latency.

REALTIME PERFORMANCE

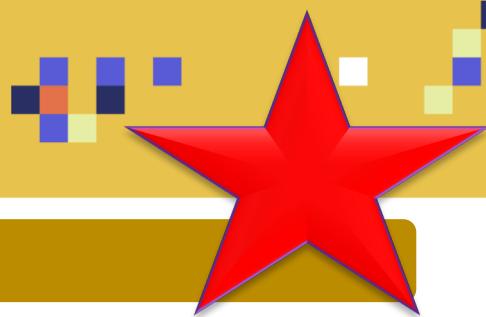
- Works in Realtime (with Kinesis Video Streams) and in batch mode to analyze millions of images.

LOW COST

- Only pay for per images and video time along with storage. Zero upfront cost.



AMAZON REKOGNITION: FEATURES



OBJECT DETECTION AND SCENE UNDERSTANDING

- Object and scene recognition besides activity detection such as “cat drinking milk”

FACIAL RECOGNITION

- Feed in a series of images to perform facial recognition.

FACIAL ANALYSIS

- Obtain information about your face such as age, level of happiness, and facial hair.

PATHING

- Amazon Rekognition can capture the path of objects in a given scene. Example: athletes movement in a field to perform post-game analysis.

UNSAFE CONTENT IDENTIFICATION

- Detect inappropriate or hazardous content.

CELEBRITY RECOGNITION

- Recognize faces of celebrities.

TEXT IN IMAGES

- Amazon Rekognition can detect text from images, such as street names and license plates.

AMAZON REKOGNITION: IN ACTION!



AWS Services Resource Groups 🔍

RyanAhmed N. Virginia Support

Amazon Rekognition Metrics Demos Object and scene detection

Rekognition automatically labels objects, concepts and scenes in your images, and provides a confidence score.

Done with the demo? [Learn more](#)

Results

City	99.1 %
Town	99.1 %
Building	99.1 %
Urban	99.1 %
Metropolis	98.5 %
High Rise	98.2 %

Show more ▶ Request ▶ Response

Object and scene detection

Choose a sample image Use your own image Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

or drag and drop

The screenshot shows the 'Object and scene detection' demo page. On the left, a sidebar lists various services like Metrics, Demos, and Additional Resources. The main area features a large image of the New York City skyline. Below it are two input fields: 'Choose a sample image' with a thumbnail of a street scene, and 'Use your own image' with a thumbnail of a blue sky. A central button says 'Upload' or 'or drag and drop'. To the right, the 'Results' section displays a table of detected concepts with their confidence scores. At the bottom, there are links for 'Show more', 'Request', and 'Response'.

AMAZON REKOGNITION: IN ACTION!



DNS Services Resource Groups

RyanAhmed N. Virginia Support

Amazon Rekognition

Metrics

Demos

Object and scene detection

Image moderation

Facial analysis

Celebrity recognition

Face comparison

Text in image

Video Demos

Video analysis

Additional Resources

Getting started guide

Download SDKs

Developer resources

Pricing

FAQ

Forum

Facial analysis

Get a complete analysis of facial attributes, including confidence scores.

Choose a sample image

Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload or drag and drop

Done with the demo? [Learn more](#)

Results

looks like a face	99.9 %
appears to be male	99.4 %
age range	22 - 34 years old
smiling	99.9 %
appears to be happy	99.7 %
not wearing glasses	99.6 %
not wearing sunglasses	99.9 %
eyes are open	93.1 %
mouth is open	99.8 %
does not have a mustache	83.5 %

AMAZON REKOGNITION: IN ACTION!



AWS Services Resource Groups

Get a complete analysis of facial attributes, including confidence scores.

Amazon Rekognition

- Metrics
- Demos
- Object and scene detection
- Image moderation
- Facial analysis**
- Celebrity recognition
- Face comparison
- Text in image

Video Demos

- Video analysis

Additional Resources

- Getting started guide
- Download SDKs
- Developer resources
- Pricing
- FAQ
- Forum

Choose a sample image

Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload or drag and drop

Done with the demo?
[Learn more](#)

▼ Results

Attribute	Confidence Score (%)
looks like a face	100 %
appears to be male	94.3 %
age range	23 - 35 years old
smiling	99.8 %
appears to be happy	99.3 %
not wearing glasses	99.1 %
not wearing sunglasses	99.8 %
eyes are open	64.7 %
mouth is open	98.9 %
does not have a mustache	98.4 %
does not have a beard	81.2 %

AMAZON COMPREHEND

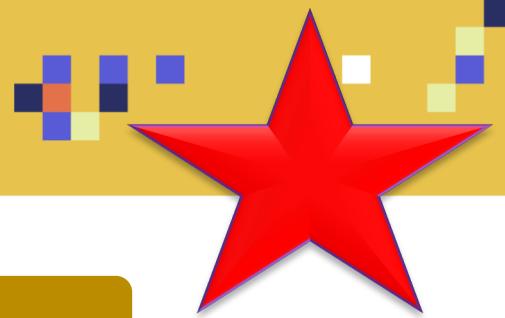


AMAZON COMPREHEND



- Amazon Comprehend is a natural language processing (NLP) service that relies on Machine learning/Artificial Intelligence to gain valuable insights from text.
- You do not need to know any machine learning or programming to use Amazon Comprehend!
- Use cases:
 - Use Comprehend to analyze customer-related text such as product reviews, social media posts, and emails.
 - This is crucial for companies because now they can perform sentiment analysis on the data (getting a feel of whether customers are happy or not!)
- Amazon Comprehend follows pay per use model
- No need for machine learning experience and servers to manage
- Comprehend is capable of:
 - Identify important phrases
 - List Brands
 - Sentiment analysis (whether customers are happy or not)
 - Extract locations and places

AMAZON COMPREHEND: FEATURES



EXTRACT CRITICAL CUSTOMER INSIGHTS

- Amazon Comprehend can provide important information about customers such as whether they are happy or not with the produce or service. This is done by analyzing customers data from social media posts and product reviews.

DOCUMENT ORGANIZATION

- Amazon Comprehend can take in a series of documents and organize them by topics. You can then use these organized topics to offer customized/targeted customer experience.

EASILY TRAINED ON YOUR OWN DATA (ZERO ML EXPERIENCE)

- Anyone can feed in data to Comprehend and it identifies key elements in the data such as part codes. It could also organize social media posts by product for example.

WORKS WITH GENERAL AND SPECIFIC INDUSTRY

- Amazon comprehend can be used for general text or for industry specific cases such as Amazon comprehend Medical (see next slide!)

AMAZON COMPREHEND MEDICAL



- Comprehend offers a specialized service in the medical field known as Amazon Comprehend Medical.
- Amazon comprehend medical can take in unstructured medical data such as doctor's notes and patient health records and generate medical information from unstructured data such as:
 - Medications
 - Dosages
 - Strengths
 - Frequencies
- Use case:
 - **Input:** feed in Amazon Comprehend Medical with unstructured doctors notes
 - **Output:** Amazon comprehend will generate medications, dosage, strength, and frequency



AMAZON COMPREHEND: IN ACTION!

The screenshot shows the AWS Amazon Comprehend service interface under the 'Real-time analysis' section. On the left, a sidebar lists options like 'Real-time analysis', 'Analysis jobs', 'Customization' (with 'Custom classification' and 'Custom entity recognition'), and 'Amazon Comprehend Medical' (with 'Real-time analysis' and 'Analysis jobs'). A red arrow labeled 'INPUTS' points from the text input area to the sidebar. The main content area has a blue header bar with 'Learn more' and a description about indexing and analyzing unstructured text. Below this is a breadcrumb navigation: 'Amazon Comprehend > Real-time analysis'. The main title is 'Real-time analysis' with an 'Info' link. A sub-section titled 'Input text' shows a text input box containing the sentence 'Udemy.com is an online learning platform aimed at professional adults and students.' A larger block of text below it discusses Udemy's global reach and corporate customers. A red arrow labeled 'OUTPUTS' points from the 'Insights' section to this text. At the bottom of the 'Input text' section are 'Clear text' and 'Analyze' buttons. The 'Insights' section below contains tabs for 'Entities', 'Key phrases', 'Language', 'Sentiment', and 'Syntax', with the 'Entities' tab currently selected. A red dashed oval highlights the 'Entities' tab and the surrounding area.

AMAZON COMPREHEND: ENTITIES AND KEY PHRASES

AWS Services Resource Groups

Amazon Comprehend

Real-time analysis Analysis jobs

Customization Custom classification Custom entity recognition

Amazon Comprehend Medical Real-time analysis Analysis jobs

Entities Key phrases Language Sentiment Syntax

Analyzed text

Udemy.com is an online learning platform aimed at professional adults and students. Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. Udemy also has over 4,000 enterprise customers and 80% of Fortune 100 companies use Udemy for employee upskilling (Udemy for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. Udemy has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3] As of 2019, there are more than 130,000 courses on the website.[4]

Results

Entity	Category	Confidence
Udemy.com	Title	0.51
Udemy	Organization	0.99+
more than 30 million students	Quantity	0.99+
50,000 instructors	Quantity	0.99+
60 languages	Quantity	0.95
over 245 million course	Quantity	0.99+
190+ countries	Quantity	0.99+
2/3 of students	Quantity	0.99+

AWS Services Resource Groups

Amazon Comprehend

Real-time analysis Analysis jobs

Customization Custom classification Custom entity recognition

Amazon Comprehend Medical Real-time analysis Analysis jobs

Entities Key phrases Language Sentiment Syntax

Analyzed text

Udemy.com is an online learning platform aimed at professional adults and students. Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. Udemy also has over 4,000 enterprise customers and 80% of Fortune 100 companies use Udemy for employee upskilling (Udemy for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. Udemy has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3] As of 2019, there are more than 130,000 courses on the website.[4]

Results

Key phrases	Confidence
Udemy.com	0.98
an online learning platform	0.99+
professional adults and students	0.96
Udemy	0.64
a portmanteau	0.99+
+ academy	0.89
more than 30 million students	0.98

AMAZON COMPREHEND: LANGUAGE AND SENTIMENT

AWS Services Resource Groups ⚡

Amazon Comprehend X

Real-time analysis Analysis jobs

Customization Custom classification Custom entity recognition

Amazon Comprehend Medical Real-time analysis Analysis jobs

Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. **Udemy** also has over 4,000 enterprise customers and 80% of Fortune 100 companies use **Udemy** for employee upskilling (**Udemy** for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. **Udemy** has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3]

842 of 5000 characters used.

Analyze

Insights Info

Entities Key phrases Language Sentiment Syntax

Analyzed text

Udemy.com is an online learning platform aimed at professional adults and students. Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. Udemy also has over 4,000 enterprise customers and 80% of Fortune 100 companies use Udemy for employee upskilling (Udemy for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. Udemy has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3] As of 2019, there are more than 130,000 courses on the website.[4]

▼ Results

Language

English, en
0.99 confidence

► Application integration

AWS Services Resource Groups ⚡

Amazon Comprehend X

Real-time analysis Analysis jobs

Customization Custom classification Custom entity recognition

Amazon Comprehend Medical Real-time analysis Analysis jobs

Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. **Udemy** also has over 4,000 enterprise customers and 80% of Fortune 100 companies use **Udemy** for employee upskilling (**Udemy** for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. **Udemy** has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3]

842 of 5000 characters used.

Analyze

Insights Info

Entities Key phrases Language Sentiment Syntax

Analyzed text

Udemy.com is an online learning platform aimed at professional adults and students. Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. Udemy also has over 4,000 enterprise customers and 80% of Fortune 100 companies use Udemy for employee upskilling (Udemy for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. Udemy has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3] As of 2019, there are more than 130,000 courses on the website.[4]

▼ Results

Sentiment

Sentiment	Confidence
Neutral	0.98 confidence
Positive	0.01 confidence
Negative	0.00 confidence
Mixed	0.00 confidence

► Application integration

AMAZON COMPREHEND: SYNTAX



Screenshot of the AWS Amazon Comprehend Syntax analysis interface.

The interface shows the analyzed text: "Udemy.com is an online learning platform aimed at professional adults and students. Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. Udemy also has over 4,000 enterprise customers and 80% of Fortune 100 companies use Udemy for employee upskilling (Udemy for Business). Students take courses largely as a means of improving job-related skills.[2] Some courses generate credit toward technical certification. Udemy has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.[3] As of 2019, there are more than 130,000 courses on the website.[4]"

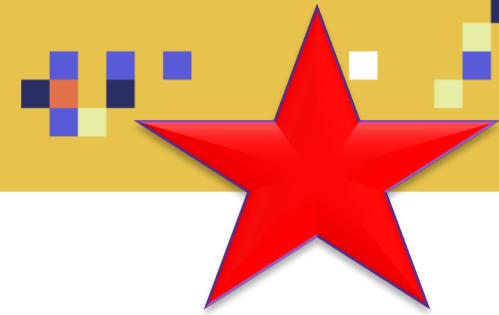
The results table lists the following words and their parts of speech:

Word	Part of speech	Confidence
Udemy.com	Proper noun	0.67
is	Verb	0.99+
an	Determiner	0.99+
online	Adjective	0.84
learning	Noun	0.91
platform	Noun	0.99+
aimed	Verb	0.99+
at	Adposition	0.99+

AMAZON TRANSLATE

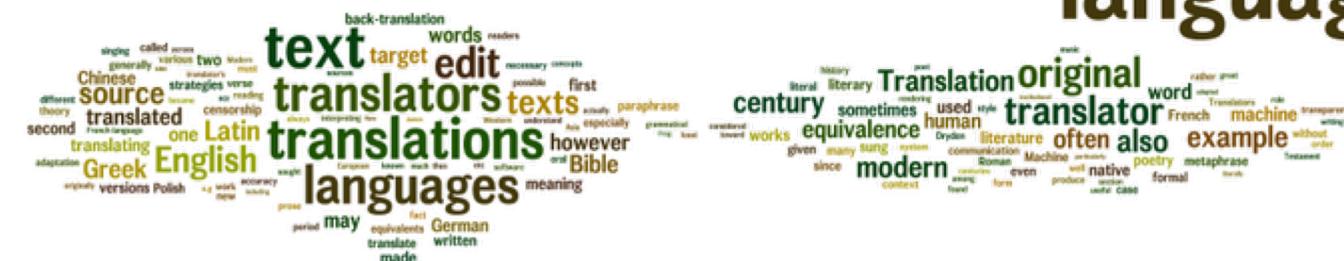


AMAZON TRANSLATE



- Amazon Translate offers a translation service using deep learning.
- Amazon translate offers multiple language translation so it makes it easier for corporates and content producers to localize content to any country ,
- Amazon translate offer more natural, robust and accurate translation compared to basic rule-based translation methods.

translation language



AMAZON TRANSLATE: FEATURES



CONTINOUS PERFORMANCE IMPROVEMENT

- Amazon Translate is based on deep learning. The algorithms are getting better everyday as more data becomes available.

EASY INTEGRATION

- Amazon Translate offers a simple API so it simplifies the process of building real-time application.

CUSTOMIZABLE

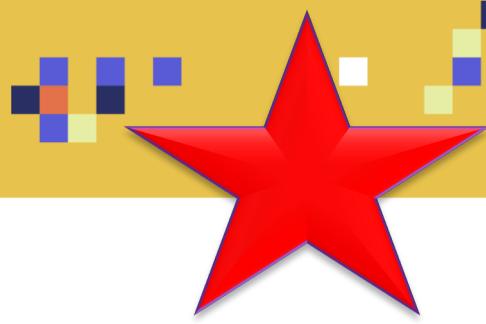
- Minimum need of editing by human translators. Amazon Translate offers customization features that allows you to select how to translate unique terms.

EASILY SCALABLE

- Amazon translate can be easily scaled and works with words, paragraphs and large scale documents.



AMAZON TRANSLATE: USE CASES



USE CASE #1: PERFORM SENTIMENT ANALYSIS ON CONTENT WITH MULTIPLE LANGUAGES

- By integrating Amazon Translate with Amazon Comprehend, you can get critical information about your customers such as reviews, are they happy with the product or not..etc.
- This could be done by using Amazon translate to convert from any language to English and then run Amazon Comprehend (natural language processing (NLP) application) to make sentiment analysis predictions

USE CASE #2: PERFORM REALTIME CONTENT TRANSLATION

- In Realtime, Amazon translate can translate content such as feed stories, news, and comments.
- By relying on English speaking workforce only to address customers Q&A, Amazon Translate can provide real-time translation to chat and email from any language to English.

AMAZON TRANSLATE: LANGUAGES SAMPLE



AWS Services Resource Groups Ryan

Machine learning

Amazon Translate

Natural and fluent translation

Amazon Translate provides fast, affordable, and quality translations for your multilingual needs.

How it works

Amazon Translate uses deep learning techniques to produce more accurate and fluent translation than traditional statistical and rule-based translation models.

Features and benefits

High-quality Real-time

Start translating text
We know you're curious. Jump in and test our Machine Translation API.
[Launch real-time translation](#)

Pricing (US)

The first 2 million characters in each monthly cycle will be free for the first 12 months starting the day you first use the service. Usage beyond the first 2 million characters every month will be billed at \$15 per million input characters, on a pay-as-you-go basis - no setup cost and no minimum fee. For additional pricing details, see the Amazon Translate pricing page on our website.

2 million characters/month	Free
1 million characters	\$15

Target language

English (en)



Arabic (ar)

Chinese (zh)

Chinese Traditional (zh-TW)

Czech (cs)

Danish (da)

Dutch (nl)

English (en)

Finnish (fi)

French (fr)

German (de)

Greek (el)

Hebrew (he)

Hindi (hi)

Hungarian (hu)

Indonesian (id)

Italian (it)

Japanese (ja)

Korean (ko)

Malay (ms)

Norwegian (no)

AMAZON TRANSLATE: ENGLISH TO ARABIC

The screenshot shows the Amazon Translate interface for real-time translation. The source language is set to "Auto (auto)" and the target language is "Arabic (ar)". The input text is about Udemy, an online learning platform. The translated output in Arabic discusses Udemy's global reach, its business customers, and its employee upskilling program. A note at the bottom right indicates the data is from 2019.

Source language: Auto (auto)

Target language: Arabic (ar)

Udemy.com is an online learning platform aimed at professional adults and students.

Udemy, a portmanteau of you + academy, has more than 30 million students and 50,000 instructors teaching courses in over 60 languages. There have been over 245 million course enrollments. Students and instructors come from 190+ countries and 2/3 of students are located outside of the U.S. Udemy also has over 4,000 enterprise customers and 80% of Fortune 100 companies use Udemy for employee upskilling (Udemy for Business). Students take courses largely as a means of improving job-related skills.^[2] Some courses generate credit toward technical certification. Udemy has made a special effort to attract corporate trainers seeking to create coursework for employees of their company.^[3]

As of 2019, there are more than 130,000 courses on the website.^[4]

842 characters, 842 of 5000 bytes used. [Info](#)

Detected language: English (en)

▶ Additional settings

Udemy.com هو منصة تعلم عبر الإنترنت تهدف إلى البالغين والطلاب المحرفيين. Udemy، أحد أكاديمية+portmanteau ممك، أكثر من 30 مليون طالب و 50.000 مدرب تدريس دورات في أكثر من 60 لغة. وقد بلغ عدد المانحين بالدورات الدراسية أكثر من 245 مليون طلاب والمدربون يأتون من أكثر من 190 دولة، وبقى 2/3 من الطلاب خارج الولايات المتحدة الأمريكية لديها أيضاً أكثر من 4:000 عميل المؤسسة و 80% من الشركات فورهن 100 استخدام Udemy لتطوير مهارات الموظفين (Udemy for Business)، يأخذ الطلاب دورات إلى حد كبير كوسيلة لتحسين المهارات المتعلقة بالعمل.^[2] بعض الدورات تولد الأصوات نحو الاعتماد الفنى، بذلك Udemy جهداً خاصاً لجذب المدربين الشركات الذين يسعون إلى إنشاء دورات تدريبية لموظفي شركتهم.^[3]

اعتباراً من عام 2019، هناك أكثر من 130.000 دوره على الموقع.^[4]

Is this translation what you expected? Please leave us [feedback](#)

AMAZON TRANSCRIBE



AMAZON TRANSCRIBE



- Amazon Transcribe is a speech to text service (Automatic Speech Recognition (ASR)).
- You can feed in audio files from Amazon S3 to Amazon Transcribe and then get text file as an output.
- Amazon transcribe works in Realtime as well! Feed in live audio steam and generate transcripts on the fly!
- Applications:
 - Movie/YouTube Subtitles
 - Customer audio calls transcription

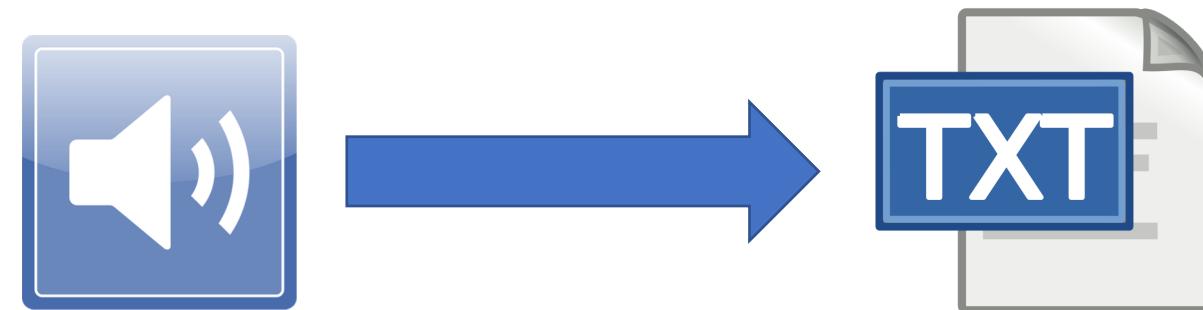
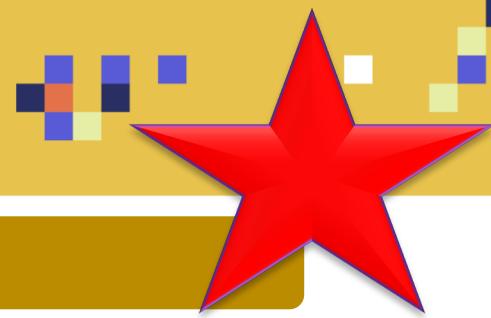


Photo Credit: <https://pixabay.com/vectors/audio-button-volume-box-glossy-152943/>

Photo Credit: <https://commons.wikimedia.org/wiki/File:Text-txt.svg>

AMAZON TRANSCRIBE: KEY FEATURES



NATURAL TRANSCRIPTIONS WITH PUNCTUATION

- Using advanced Deep Learning algorithms, Amazon Transcribe offers punctuation and formatting automatically

GENERATES TIMESTAMPS

- Amazon Transcribe returns a timestamp for each word, so that you can easily locate the audio in the original recording by searching for the text.

MANY USE CASES

- Works great with poor Audio quality such as customer phone calls

RICH VOCABULARY

- Amazon transcribe allows users to add their own custom vocabulary words to enrich its content.

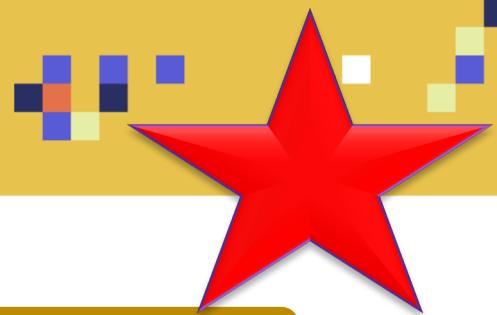
TRANSCRIBE AUDIO FROM MANY SPEAKERS

- Amazon Transcribe is capable of classifying text from many speakers. This is extremely efficient with cases such as phone calls and meeting transcriptions

MULTI CHANNEL IDENTIFICATION

- Amazon Transcribe is able to consume audio files from many channels.

AMAZON TRANSCRIBE: USE CASES



USE CASE #1: ENHANCED CUSTOMER SERVICE

- Integrating Amazon Transcribe with Amazon Comprehend can allow companies to record voice data such as phone calls, converting them into text (Using Transcribe) and then analyzing them (with comprehend) to obtain sentiment, intent and valuable insights.

USE CASE #2: AUTOMATIC SUBTITLES

- Amazon Transcribe could allow content creators to easily and effectively generate subtitles for their videos. Time stamps is also provided!

USE CASE #3: ARCHIVING AUDIO CONTENT

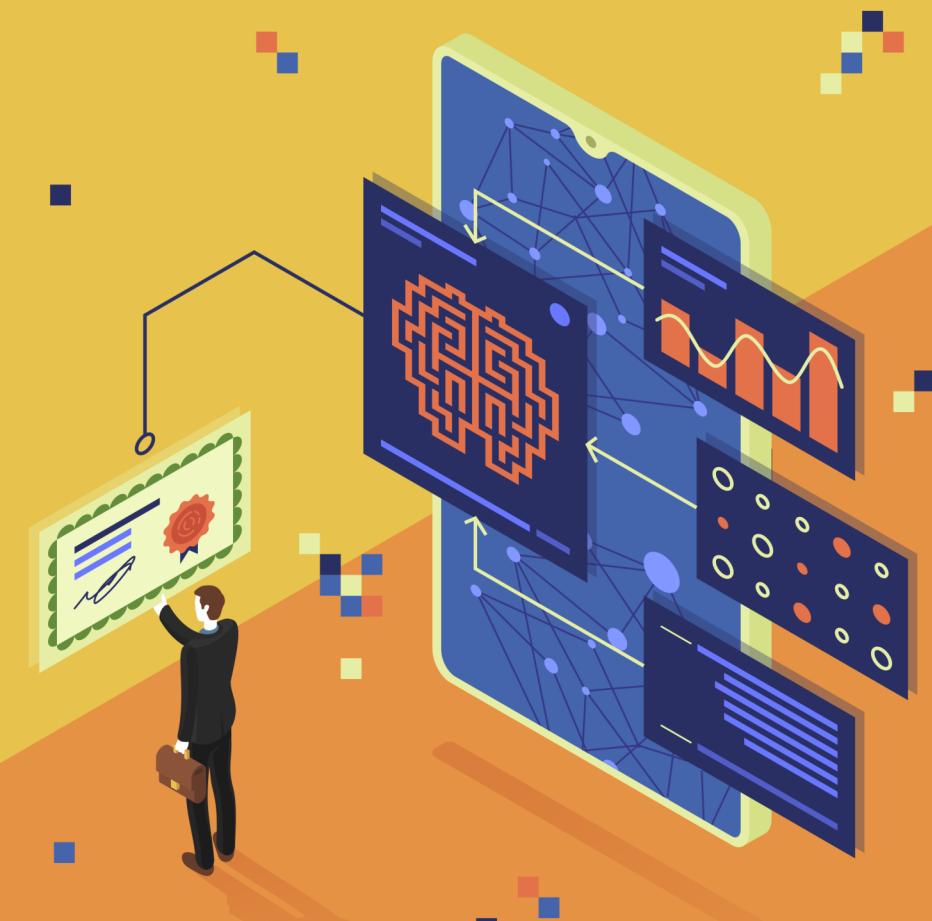
- To enhance corporate compliance and reduce risk for enterprises, companies can use transcribe to convert audio and video content into text (searchable archives). Amazon Elasticsearch service can be later used to perform text-based search across audio/video library.

AMAZON TRANSCRIBE: IN ACTION!



The screenshot shows the Amazon Transcribe service interface. At the top, there's a navigation bar with the AWS logo, 'Services' dropdown, 'Resource Groups' dropdown, and a bell icon. The main title is 'Amazon Transcribe' with a 'Real-time transcription' sub-section selected. Below the title, it says 'Real-time transcription' with an 'Info' link. A descriptive text reads: 'See how Amazon Transcribe creates a text copy of speech in real time. Choose Start streaming and talk.' On the left, a sidebar lists 'Real-time transcription', 'Transcription jobs', and 'Custom vocabulary'. The main content area has a 'Transcription' section with a 'Download full transcript' button and an orange 'Start streaming' button. It includes a language dropdown set to 'English (United States)'. A text box displays two lines of transcribed text: 'I love this course because it would make me pass the machine learning certification exam.' followed by 'I love this course because it would make me pass the machine learning certification exam.'. Below this, it says '00:00 of 15:00 audio stream'. There are also sections for 'Additional settings' and 'Application integration'.

AMAZON POLLY



AMAZON POLLY: OVERVIEW



- Amazon Polly is a Text to Speech (TTS) service.
- Amazon Polly offers natural speech by relying on Deep Learning.
- Users can select many voices and languages.
- Amazon Polly offers Neural Text-to-Speech (NTTS) voices makes it extremely natural!

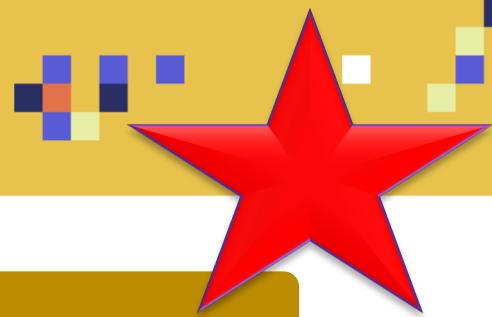


[Photo Credit: https://pixabay.com/vectors/audio-button-volume-box-glossy-152943/](https://pixabay.com/vectors/audio-button-volume-box-glossy-152943/)

[Photo Credit: https://commons.wikimedia.org/wiki/File:Text-txt.svg](https://commons.wikimedia.org/wiki/File:Text-txt.svg)

[Photo Credit: https://commons.wikimedia.org/wiki/File:Polly_want_a_finger-1_\(5325523581\).jpg](https://commons.wikimedia.org/wiki/File:Polly_want_a_finger-1_(5325523581).jpg)

AMAZON POLLY: BENEFITS



NATURAL VOICE

- Offers many languages with multiple lifelike voices (males/females)

SPEECH STORAGE

- Amazon Polly allows for free unlimited playback of voice audio formats like MP3 and OGG.

STEAMING

- Voices could be played immediately in Realtime.

CUSTOMIZABLE OUTPUT

- Polly supports lexicons and SSML tags that allows users to control pronunciation, volume, pitch, speed rate, etc. Example: yolo = you only live once!

COST EFFECTIVE

- Pay per use model.



AMAZON POLLY: IN ACTION!



AWS Services Resource Groups RyanAhmed

Amazon Polly

Text-to-Speech

Listen, customize, and download speech. Integrate when you're ready.

Type or paste your text in the window, choose your language and region, choose a voice, choose Listen to speech, and then integrate it into your applications and services.

With up to 3000 characters you can listen, download, or save immediately. For up to 100,000 characters, your task must be saved to an S3 bucket.

Plain text SSML ?

Hi! I'm Matthew. I will read any text you type here.

52 characters used Show default text Clear text

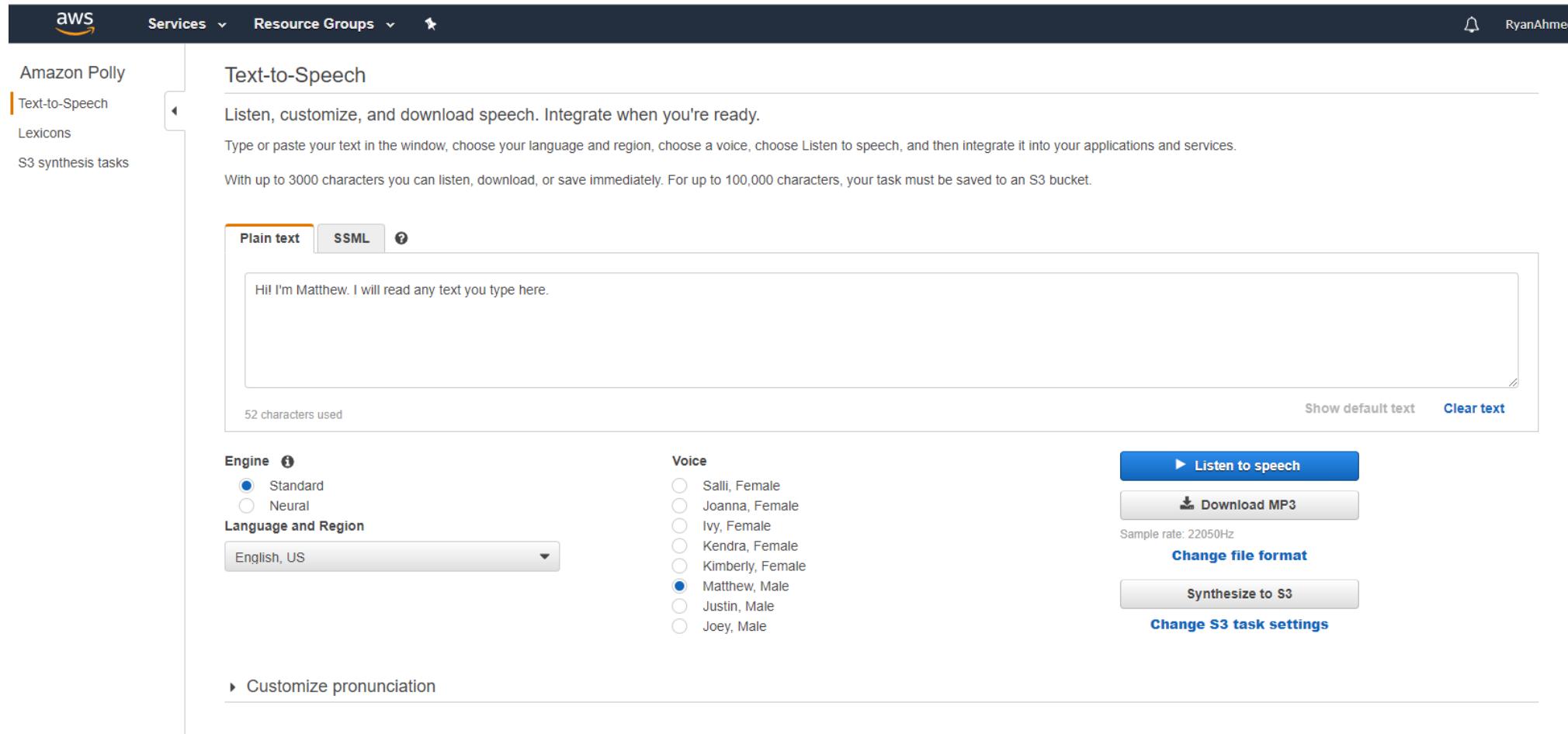
Engine ⓘ
 Standard
 Neural

Language and Region
English, US

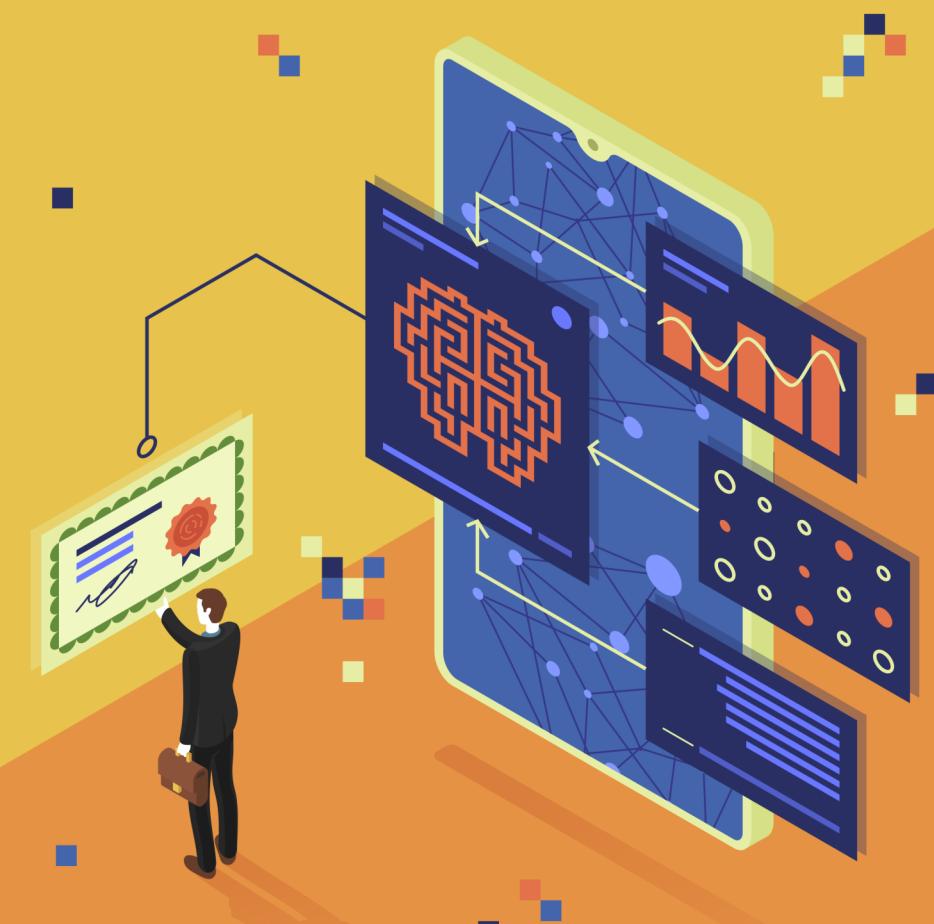
Voice
 Salli, Female
 Joanna, Female
 Ivy, Female
 Kendra, Female
 Kimberly, Female
 Matthew, Male
 Justin, Male
 Joey, Male

▶ Listen to speech
Download MP3
Sample rate: 22050Hz
Change file format
Synthesize to S3
Change S3 task settings

Customize pronunciation



AMAZON FORECAST

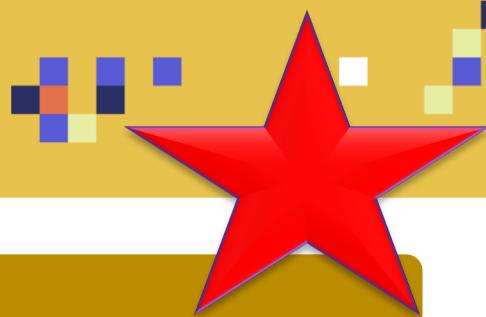


AMAZON FORECAST: OVERVIEW

- Amazon Forecast is used to generate accurate future predictions such as future business sales, demand, resources needed and revenue.
- Making these accurate predictions is critical for companies who want to manage future resources and make informed decisions.
- Amazon Forecast requires zero machine learning experience to use.
- Amazon Forecast requires no servers to provision so it's fully managed service.
- Amazon forecast is based on the same technology that Amazon uses to make predictions. It could combine several time series data to build accurate ML forecast model.
- Amazon Forecast works by looking at historical time series data to make predictions.
- Unlike vanilla prediction tools that make forecasts by simply looking at historical sales data, Amazon forecast is capable of combining other factors such as product features, price changes, discounts made, number of employees.



AMAZON FORECAST: FEATURES



FORECAST GENERATE 50% HIGHER ACCURACY

- Amazon Forecast is extremely accurate, offering up to 50% more accurate results by relying on machine learning.

MUCH MORE EFFICIENT

- Amazon Forecast can be used to generate accurate predictions in hours instead of month.
- Users need to simply move time series data from S3 to Amazon Forecast.
- Amazon Forecast then automatically performs analysis on the data, identifies key features, train and optimizes the model.
- Trained model could then be hosted for inference to generate forecasts.

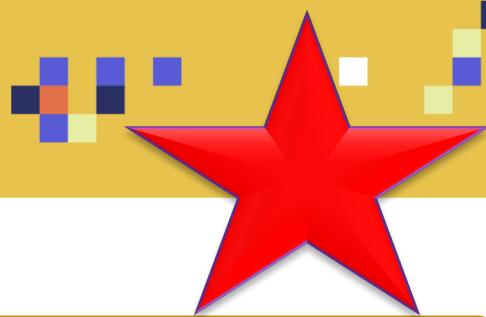
APPLIED TO ANY BUSINESS

- Amazon Forecast could be applied to any business to perform cash flow predictions, resource planning, and product demand.
- It could be applied in retail, logistics, and finance industries.

HIGH SECURITY

- Forecast encrypts your data using customer keys through Key Management Service.
- Data is encrypted at rest.
- Access to Amazon Forecast is also controlled using AWS Identity and Access Management (IAM).

AMAZON FORECAST: USE CASES



PRODUCT DEMAND PLANNING

- Amazon Forecast could be used to forecast inventory levels.
- By feeding in the algorithm with historical of sales, promotions and outlet locations along with weather, website traffic, the algorithm will train a model to generate accurate product demand forecasts.
- Doing so will empower companies to properly stock inventory in various store locations in anticipation of forecasted demand.

FINANCIAL PLANNING

- Amazon Forecast could be used to accurately predict company's financial information such as revenue, sales, expenses and cash flow.

RESOURCE PLANNING

- Amazon forecast could be used to make predictions related to number of employees, raw materials, advertising, and revenue.

AMAZON LEX

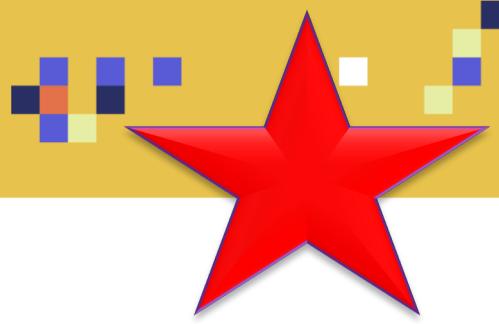


AMAZON LEX: OVERVIEW

- Amazon Lex is Amazon Alexa for anyone!
- Amazon Lex democratizes deep learning and allow any developer to harness the power of deep learning.
- Amazon Lex is a fully managed service so no need for servers provisioning.
- Amazon Lex relies on deep learning to create chatbots (voice and text).
- Amazon Lex is capable of converting speech to text and then understand the intent based on the that text.
- It combines two Technologies:
 - **Automatic speech recognition (ASR)**: converts speech to text
 - **Natural Language Understanding (NLU)**: understand the intent from text



AMAZON LEX: USE CASE

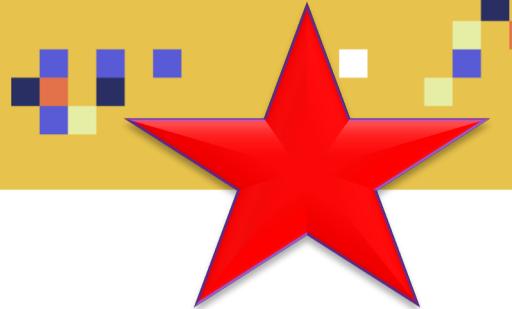


Call Center Chat Bots:

- Amazon Lex could be used to create a chatbot in call centers
- Amazon Lex understands customers intent and change passwords and schedule appointments.
- Human speech analysis is done at 8 kHz audio sampling rate.
- Amazon Lex uses AWS Lambda functions to query business applications and provide data back to customers.



AMAZON LEX: USE CASE UNDER THE HOOD



"Customer makes phone call to schedule an appointment"



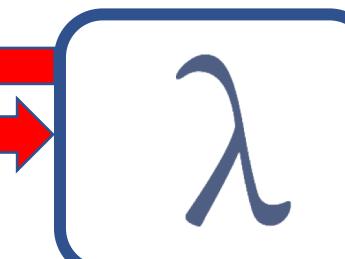
AMAZON CONNECT

"Amazon Connect audio to Lex"



AMAZON LEX

"Understands the intent of the customer and send request to Lambda function"



AWS LAMBDA

"Lambda calls database to find customer information"



CUSTOMER SCHEDULING SOFTWARE

"Lambda summons the customer scheduling software"

"Confirmation message sent to customer"



"UNFORTUNATELY ANOTHER JOB REPLACED BY AI"

Photo Credit: <http://www.freestockphotos.biz/stockphoto/15684>

<https://www.goodfreephotos.com/vector-images/blue-calendar-vector-clipart.png.php>

<https://www.needpix.com/photo/1027210/customer-support-service-help-communication-contact-operator-telephone-person>

<https://www.pexels.com/photo/man-having-a-phone-call-in-front-of-a-laptop-859264/>

AMAZON PERSONALIZE



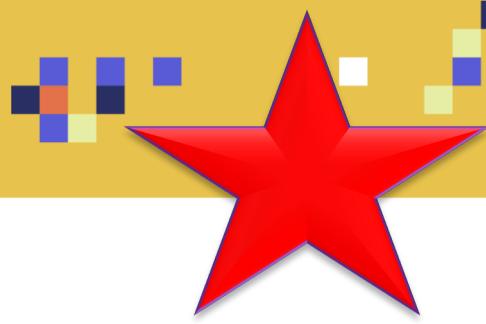
AMAZON PERSONALIZE: OVERVIEW



- Amazon Personalize is used to generate personalized recommendation to customers.
- Companies can use Amazon personalize to send product recommendations and launch a personalized targeted marketing campaigns.
- No machine learning is required!
- Amazon personalize works as follows:
 - Provide Amazon Personalize with customer activity stream online such as click streams and previous purchases.
 - Also provide Amazon personalize with inventory details.
 - Amazon personalize analyzes all the information and develop an optimized personalization model.



AMAZON PERSONALIZE: FEATURES



MAKE ACCURATE RECOMMENDATION

- Amazon personalize works well with hard problems such as new customers (no historical data), changing customer tastes and popularity biases.

REALTIME

- Amazon Personalize combines historical personalized information about each customer with real-time user activity data to make right product recommendations fast.

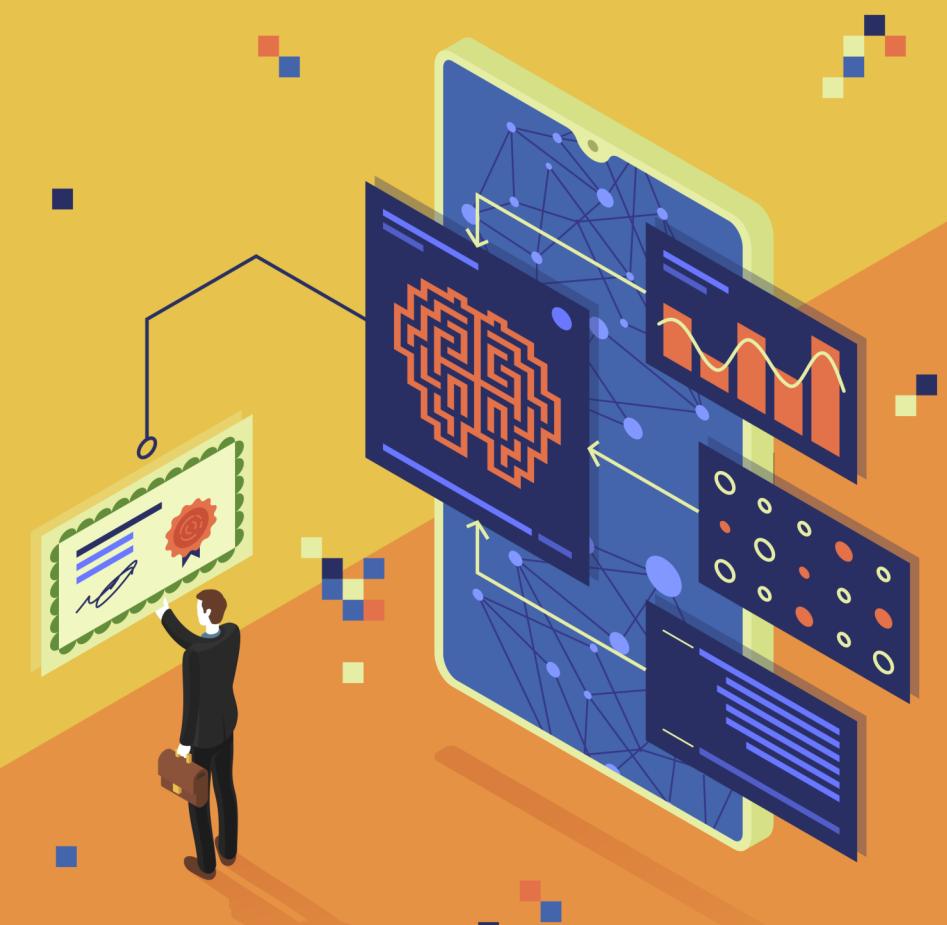
PERSONALIZE EVERYTHING!

- Amazon Personalize can be effectively and easily integrated with websites and mobile apps with a simple API call.

FAST DEPLOYMENT

- With Amazon Personalize requires zero machine learning experience so personalization can be achieved in hours not months!

AMAZON Textract



AMAZON TEXTRACT: OVERVIEW

- Amazon Textract could extract text and data from scanned documents.
- Textract can tell if certain characters are date of birth, SIN number and person's marital status for example.
- Textract is much more powerful compared to basic optical character recognition (OCR).
- Even if field locations are changing from one forum to another, Textract is able to extract this information.
- No machine learning experience is required.
- Textract could be used to create intelligent automated workflow as follows:
 - Textract processes millions of documents in couple of hours and extract information.
 - Using other AWS services, automated approvals could be made.



Photo Credit: <https://publicdomainvectors.org/en/free-clipart/Reading-girl/72485.html>

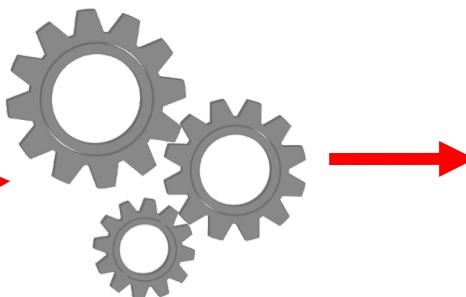
AMAZON TEXTRACT: OVERVIEW



1. Introduction		
Deep learning has dramatically improved the state-of-the-art in many different artificial intelligent tasks like object detection, speech recognition, machine translation (LeCun et al., 2015). Its deep architecture nature grants deep learning the possibility of solving many more complex AI problems (LeCun et al., 2015). As a result, deep learning has been applied to a variety of different modern domains and tasks in addition to traditional tasks like object detection, face recognition, or language models, for example, Osako et al. (2015) uses the recurrent neural network to denoise speech signals, Gupta et al. (2015) uses stacked autoencoders to generate images from text, and Wang et al. (2015) uses a generative neural model to generate images with different styles. Wang et al. (2016) uses deep learning to allow sentiment analysis from multiple modalities simultaneously, etc. This period is the era to witness the blossoming of deep learning research.		
However, to understand where the deep learning research frontier forward, one needs to thoroughly understand what has been integrated in the history and why current models exist in present forms. This paper summarizes the evolutionary history of several different deep learning models and explains the main ideas behind these models and their relationship to the milestones. To understand the present work it is trivial that deep learning has evolved over a long period of time, as shown in Table 1. Therefore, this section aims to offer the readers a walk-through of the major milestones of deep learning research. We will cover the milestones as shown in Table 1, as well as many additional works. We will split the story into three sections: the milestones of present research, the milestones of past research, and the milestones of the future research.		
This paper also discusses the direction of research on the human brain modeling. Although the success of deep learning nowadays is not necessarily due to its resemblance of the human brain (more due to its deep architecture), the ambition to build a system that simulate brain instead thereof the initial development of neural networks. Therefore, the next section begins with the brain and continues to discuss the age when the brain research milestones.		
With the nature of neural networks, this section continues to briefly discuss the necessity of extending shallow neural networks into deeper ones, as well as the previous deep neural networks and the challenges deep architecture introduces.		
With the extension of deep neural network, this paper diverges into three main forms of deep learning topics. In Section 3, we introduce the basic idea of how Deep Belief Nets and its construction component Restricted Boltzmann Machine evolve as a trade-off of modeling power and computational loads. In Section 5, this paper focuses on the development history of Convolutional Neural Networks, featured with the prominent steps along with the introduction of backpropagation. In Section 6, this paper discusses the development of Recurrent Neural Networks, it covers how the LSTM, attention models and the successes they achieved.		
While this paper primarily discusses deep learning models, optimization of deep architecture is an inevitable topic in this society. Section 7 is devoted to a brief summary of optimization techniques, including advances gradient method, Dropout, Batch Normalization, etc.		
This paper could be read as a complementarity of (Schmidhuber, 2015). Schmidhuber's paper is aimed to assign credit to all those who contributed to the present state of the art, so his paper focuses on every single incremental work along the path, therefore cannot elaborate the details of the milestones.		
2		

On the Origin of Deep Learning																																																											
Table 1: Major milestones that will be covered in this paper																																																											
<table border="1"><thead><tr><th>Year</th><th>Contributor</th><th>Contribution</th></tr></thead><tbody><tr><td>300 BC</td><td>Aristotle</td><td>introduced Aristotelian, started the history of human's attempt to understand brain.</td></tr><tr><td>1873</td><td>Alexander Bain</td><td>introduced Neural Groupings as the earliest model of neural network, inspired Hebbian Learning Rule.</td></tr><tr><td>1943</td><td>McCulloch & Pitts</td><td>introduced McCulloch-Pitts, which is considered as the father of Artificial Neural Models.</td></tr><tr><td>1949</td><td>Donald Hebb</td><td>considered as the father of neural networks, introduced Hebbian Learning Rule, which lays the foundation of modern neural network.</td></tr><tr><td>1958</td><td>Frank Rosenblatt</td><td>introduced the first perceptron, which highly resembles modern perception.</td></tr><tr><td>1974</td><td>Paul Werbos</td><td>introduced Backpropagation.</td></tr><tr><td>1980</td><td>Terence Kohonen</td><td>introduced Self Organizing Map.</td></tr><tr><td>1983</td><td>Kunihiko Fukushima</td><td>introduced Neocognitron, which inspired Convolutional Neural Network.</td></tr><tr><td>1982</td><td>John Hopfield</td><td>introduced Hopfield Network.</td></tr><tr><td>1985</td><td>Hinton & Sejnowski</td><td>introduced Boltzmann Machine.</td></tr><tr><td>1986</td><td>Paul Smolensky</td><td>introduced Parallel Distributed Processing, which is later known as Restricted Boltzmann Machine.</td></tr><tr><td>1988</td><td>Michael I. Jordan</td><td>defined and introduced Recurrent Neural Network.</td></tr><tr><td>1990</td><td>Yann LeCun</td><td>introduced LeNet, showed the possibility of deep neural networks in image processing.</td></tr><tr><td>1997</td><td>Schuster & Paliwal</td><td>introduced the first Unidirectional Recurrent Neural Network.</td></tr><tr><td>2000</td><td>Geoffrey Hinton</td><td>introduced LSTM, solved the problem of vanishing gradient in recurrent neural networks.</td></tr><tr><td>2000</td><td>Geoffrey Hinton</td><td>introduced Deep Belief Networks, also introduced learning rate decay, learning rate annealing, sparse coding, learning rate scheduling, momentum, weight decay, learning rate decay, learning rate annealing, sparse coding, learning rate scheduling, momentum, weight decay.</td></tr><tr><td>2000</td><td>Salakhutdinov & Hinton</td><td>introduced Deep Boltzmann Machines.</td></tr><tr><td>2012</td><td>Geoffrey Hinton</td><td>introduced Dropout, an efficient way of training neural networks.</td></tr></tbody></table>			Year	Contributor	Contribution	300 BC	Aristotle	introduced Aristotelian, started the history of human's attempt to understand brain.	1873	Alexander Bain	introduced Neural Groupings as the earliest model of neural network, inspired Hebbian Learning Rule.	1943	McCulloch & Pitts	introduced McCulloch-Pitts, which is considered as the father of Artificial Neural Models.	1949	Donald Hebb	considered as the father of neural networks, introduced Hebbian Learning Rule, which lays the foundation of modern neural network.	1958	Frank Rosenblatt	introduced the first perceptron, which highly resembles modern perception.	1974	Paul Werbos	introduced Backpropagation.	1980	Terence Kohonen	introduced Self Organizing Map.	1983	Kunihiko Fukushima	introduced Neocognitron, which inspired Convolutional Neural Network.	1982	John Hopfield	introduced Hopfield Network.	1985	Hinton & Sejnowski	introduced Boltzmann Machine.	1986	Paul Smolensky	introduced Parallel Distributed Processing, which is later known as Restricted Boltzmann Machine.	1988	Michael I. Jordan	defined and introduced Recurrent Neural Network.	1990	Yann LeCun	introduced LeNet, showed the possibility of deep neural networks in image processing.	1997	Schuster & Paliwal	introduced the first Unidirectional Recurrent Neural Network.	2000	Geoffrey Hinton	introduced LSTM, solved the problem of vanishing gradient in recurrent neural networks.	2000	Geoffrey Hinton	introduced Deep Belief Networks, also introduced learning rate decay, learning rate annealing, sparse coding, learning rate scheduling, momentum, weight decay, learning rate decay, learning rate annealing, sparse coding, learning rate scheduling, momentum, weight decay.	2000	Salakhutdinov & Hinton	introduced Deep Boltzmann Machines.	2012	Geoffrey Hinton	introduced Dropout, an efficient way of training neural networks.
Year	Contributor	Contribution																																																									
300 BC	Aristotle	introduced Aristotelian, started the history of human's attempt to understand brain.																																																									
1873	Alexander Bain	introduced Neural Groupings as the earliest model of neural network, inspired Hebbian Learning Rule.																																																									
1943	McCulloch & Pitts	introduced McCulloch-Pitts, which is considered as the father of Artificial Neural Models.																																																									
1949	Donald Hebb	considered as the father of neural networks, introduced Hebbian Learning Rule, which lays the foundation of modern neural network.																																																									
1958	Frank Rosenblatt	introduced the first perceptron, which highly resembles modern perception.																																																									
1974	Paul Werbos	introduced Backpropagation.																																																									
1980	Terence Kohonen	introduced Self Organizing Map.																																																									
1983	Kunihiko Fukushima	introduced Neocognitron, which inspired Convolutional Neural Network.																																																									
1982	John Hopfield	introduced Hopfield Network.																																																									
1985	Hinton & Sejnowski	introduced Boltzmann Machine.																																																									
1986	Paul Smolensky	introduced Parallel Distributed Processing, which is later known as Restricted Boltzmann Machine.																																																									
1988	Michael I. Jordan	defined and introduced Recurrent Neural Network.																																																									
1990	Yann LeCun	introduced LeNet, showed the possibility of deep neural networks in image processing.																																																									
1997	Schuster & Paliwal	introduced the first Unidirectional Recurrent Neural Network.																																																									
2000	Geoffrey Hinton	introduced LSTM, solved the problem of vanishing gradient in recurrent neural networks.																																																									
2000	Geoffrey Hinton	introduced Deep Belief Networks, also introduced learning rate decay, learning rate annealing, sparse coding, learning rate scheduling, momentum, weight decay, learning rate decay, learning rate annealing, sparse coding, learning rate scheduling, momentum, weight decay.																																																									
2000	Salakhutdinov & Hinton	introduced Deep Boltzmann Machines.																																																									
2012	Geoffrey Hinton	introduced Dropout, an efficient way of training neural networks.																																																									

AMAZON TEXTRACT

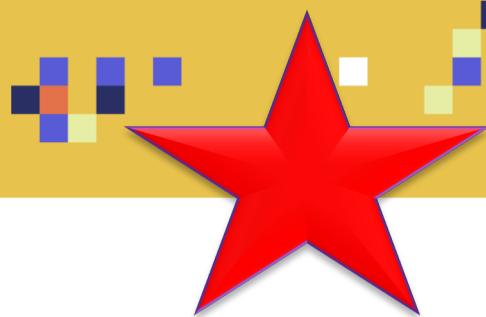


Year	Contributor	Contribution
1990	Yann LeCun	Introduced LeNet
2012	Geoffrey Hinton	Dropout

AWS DEEPLENS



AWS DEEPLENS: OVERVIEW



- AWS DeepLens is a deep learning enabled programmable video camera.
- You can use DeepLens to experiment with deep learning models that have been trained in SageMaker.
- It could support multiple frameworks such as TensorFlow, and Caffe.
- AWS DeepLens comes with preinstalled inference engine using Apache MXNet.
- You can integrate DeepLens with Amazon Rekognition to perform advanced image analysis along with Polly to develop speech-related projects.
- Check out this fun project!
 - <https://aws.amazon.com/deeplens/community-projects/Doorman/>
 - <https://www.youtube.com/watch?v=UXVD22jDbu8>

AWS DEEPLENS: COMMUNITY PROJECTS!



- Check out DeepLens community:
<https://aws.amazon.com/deeplens/community-projects/>

AWS DeepLens Overview **Community Projects** Resources FAQs

Community projects

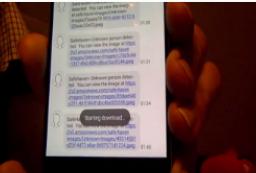


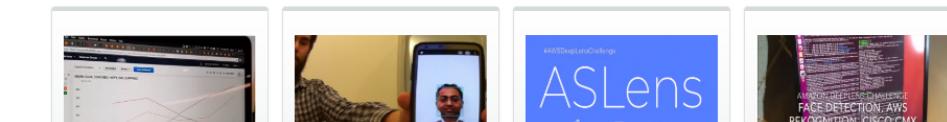
Explore the collection of AWS DeepLens projects contributed by the community of developers who participated in the AWS DeepLens Virtual Hackathon. These projects cover a range of categories, from safety and education to health and wellness and of course, pets and animals. You'll find a short video from the developers demonstrating their innovation and in most cases a more detailed description and link to their GitHub repo. Check them out and no doubt you'll be inspired!

If you have a project you have created with AWS DeepLens that you would like to share on this page you can [submit the outline here](#) for us to take a look at.

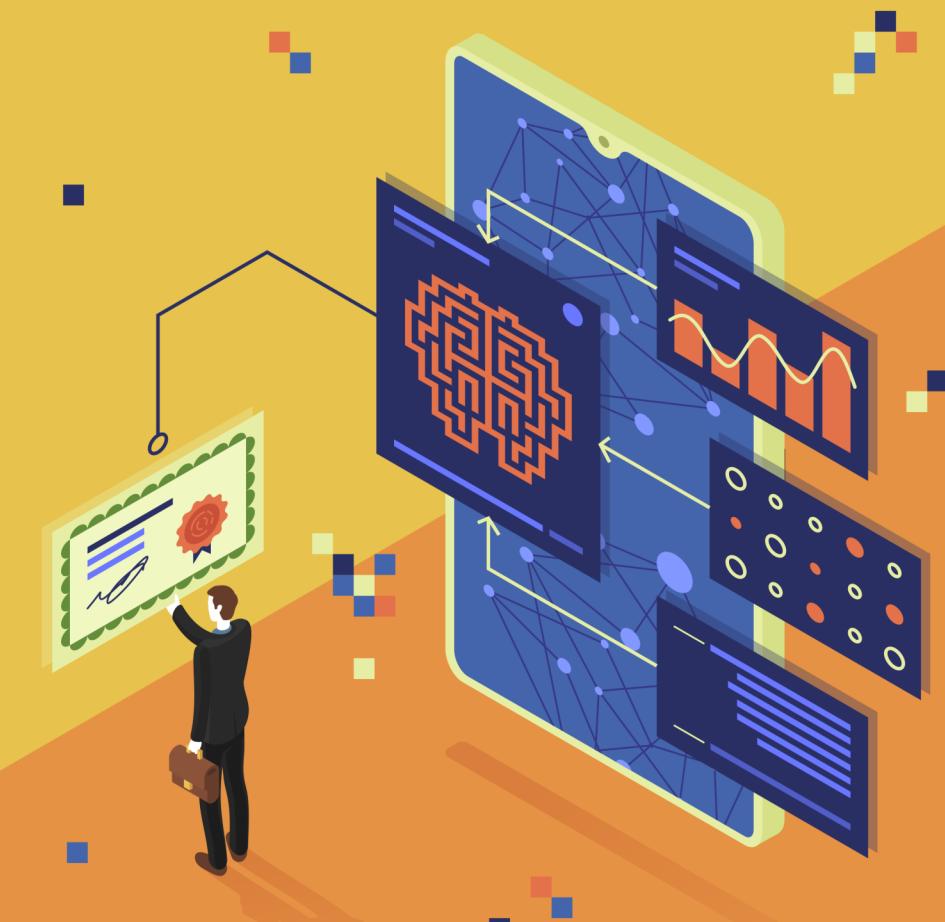
Still don't have an AWS DeepLens? You can [buy now](#).

Meet the AWS DeepLens Hackathon Winners

First Place	Second Place	Third Place
 Read To Me This is a Deep Learning enabled application which is able to read books to kids.	 Dee A fun, interactive device for children that asks them to answer questions by showing the right things.	 SafeHaven Peace of mind for vulnerable people with Alexa Visitor ID. Supportive families receive doorstep photo alerts via SMS.



AWS DEEPRACER



AWS DEEPRACER: OVERVIEW

- AWS DeepRacer allows anyone to experiment with reinforcement learning in a fun way!
- Reinforcement learning is a machine learning technique in which agents try to maximize cumulative reward by exploring their environment.
- Reinforcement learning is super powerful and allows for training without the need of expensive and time consuming labeled dataset.
- AWS DeepRacer offers the following:
 - **Simulator:** Use AWS DeepRacer 3D racing simulator to assess trained models in SageMaker.
 - **Car:** Deploy trained models on AWS DeepRacer, tons of fun!
 - **League:** Compete in a global competition.



Photo Credit: <https://www.maxpixels.net/Speedway-Racing-Nascar-Auto-Racing-Car-Sport-558070>

AWS DEEPRACER: FEATURES



LOTS OF FUN!

- Learn machine learning in a practical and fun way using DeepRacer.

EXPERIMENTATION

- AWS DeepRacer Simulator allows for running multiple experiments on single and dual cars (head to head).
- Apply Reinforcement learning and other artificial neural networks knowledge in practice!

COMPETE!

- The AWS DeepRacer League allow companies to meet best talent.

