TesnsorFlow

It is an open source artificial intelligence library, using data flow graphs to build models.

It allows developers to create large-scale neural networks with many layers.

TensorFlow is mainly used for: **Classification, Perception, Understanding, Discovering, Prediction and Creation**.

**Main Use Cases of TensorFlow**

1. **Voice/Sound Recognition**

One of the most well-known uses of TensorFlow are Sound based applications. With the proper data feed, neural networks are capable of understanding audio signals. These can be:

* Voice recognition – mostly used in IoT, Automotive, Security and UX/UI
* Voice search – mostly used in Telecoms, Handset Manufacturers
* Sentiment Analysis – mostly used in CRM
* Flaw Detection (engine noise) – mostly used in Automotive and Aviation

Regarding common use cases, we are all familiar with voice-search and voice-activated assistants with the new wide spreading smartphones such as Apple’s Siri, Google Now for Android and Microsoft Cortana for Windows Phone.

Language understanding is another common use case for Voice Recognation. Speech-to-text applications can be used to determine snippets of sound in greater audio files, and transcribe the spoken word as text.

Sound based applications also can be used in CRM. A use case scenario might be: TensorFlow algorithms standing in for customer service agents, and route customers to the relevant information they need, and faster than the agents.

1. **Text Based Applications**

Further popular uses of TensorFlow are, text based applications such as sentimental analysis (CRM, Social Media), Threat Detection (Social Media, Government) and Fraud Detection (Insurance, Finance)

**Language Detection** is one of the most popular uses of text based applications.

We all know **Google Translate**, which supports over 100 languages translating from one to another. The evolved versions can be used for many cases like translating jargon legalese in contracts into plain language.

**Text Summarization**

Google also found out that for shorter texts, summarization can be learned with a technique called sequence-to-sequence learning. This can be used to produce headlines for news articles. Below, you can see [an example](https://research.googleblog.com/2016/08/text-summarization-with-tensorflow.html) where the model reads the article text and writes a suitable headline.

|  |
| --- |
| **Input: Article 1st sentence** |
| starting from july 1, the island province of hainan in southern china will implement strict market access control on all incoming livestock and animal products to prevent the possible spread of epidemic diseases |

|  |
| --- |
| **Model-written headline** |
| hainan to curb spread of diseases |

Another Google use case is **[SmartReply](https://blog.google/products/gmail/computer-respond-to-this-email/" \t "_blank)** . It automatically generates e-mail responses (wishing for the evolved version of this one doing our business on behalf of us)

1. **Image Recognition**

Mostly used by Social Media, Telecom and Handset Manufacturers; Face Recognition, Image Search, Motion Detection, Machine Vision and Photo Clustering can be used also in Automotive, Aviation and Healthcare Industries. Image Recognition aims to recognize and identify people and objects in images as well as understanding the content and context.

TensorFlow object recognition algorithms classify and identify arbitrary objects within larger images. This is usually used in engineering applications to identify shapes for modeling purposes (3D space construction from 2D images) and by social networks for photo tagging (Facebook’s Deep Face). By analyzing thousands of photos of trees for example, the technology can learn to identify a tree it has never seen before.

Image Recognition is starting to expand in the Healthcare Industry, too where TensorFlow algorithms can process more information and spot more patterns than their human counterparts. Computers are now able to review scans and spot more illnesses than humans.

[Graphical user interface, website

Description automatically generated](https://research.googleblog.com/2014/11/a-picture-is-worth-thousand-coherent.html)

**4. Time Series**

TensorFlow Time Series algorithms are used for analyzing time series data in order to extract meaningful statistics. They allow forecasting non-specific time periods in addition to generate alternative versions of the time series.

The most common use case for Time Series is **Recommendation.**You’ve probably heard of this use from Amazon, Google, Facebook and Netflix where they analyze customer activity and compare it to the millions of other users to determine what the customer might like to purchase or watch.  These recommendations are getting even smarter, for example, they offer you certain things as gifts (not for yourself) or TV shows that your family members might like.

The other uses of TensorFlow Time Series algorithms are mainly the field of interest to Finance, Accounting, Government, Security and IoT with Risk Detections, Predictive Analysis and Enterprise/Resource Planning.

**5. Video Detection**

TensorFlow neural networks also work on video data. This is mainly used in Motion Detection, Real-Time Thread Detection in Gaming, Security, Airports and UX/UI fields.  Recently, Universities are working on Large scale Video Classification datasets like YouTube-8M aiming to accelerate research on large-scale video understanding, representation learning, noisy data modeling, transfer learning, and domain adaptation approaches for video.

**Bonus:** It is chosen as the top 20 projects worldwide (Global Finalist).  Nasa is designing a system with TensorFlow for orbit classification and object clustering of asteroids. As a result, they can classify and predict NEOs (near earth objects).

As TensorFlow is an open source library, we will see many more innovative use cases soon, which will influence one