



**Asia-Pacific
Economic Cooperation**

2021/SOM2/CTI/TPD/003

Session: 1

Cross-Border Data Flows and Emerging Technologies

Submitted by: Google



**Digital Trade Policy Dialogue
18 May 2021**



Cross-border data flows and emerging technologies

APEC SOM2 Digital Trade Policy Dialogue
17 May 2021

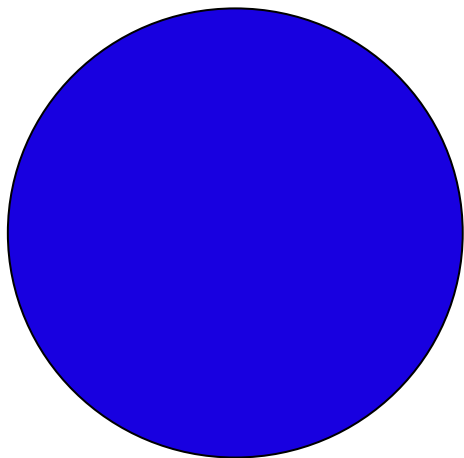


artificial intelligence

science of making things smart

machine learning

techniques to learn from data



machine learning
techniques to learn from data

given [input], what is best [output]?

machine learning scales better than rule -based code



detection of email spam

Rules and contingencies

Spam the old way:

Write a computer program with *explicit* rules to follow

```
if email contains Vlagrå  
  then mark 'is spam';  
if email contains ...  
if email contains ...
```

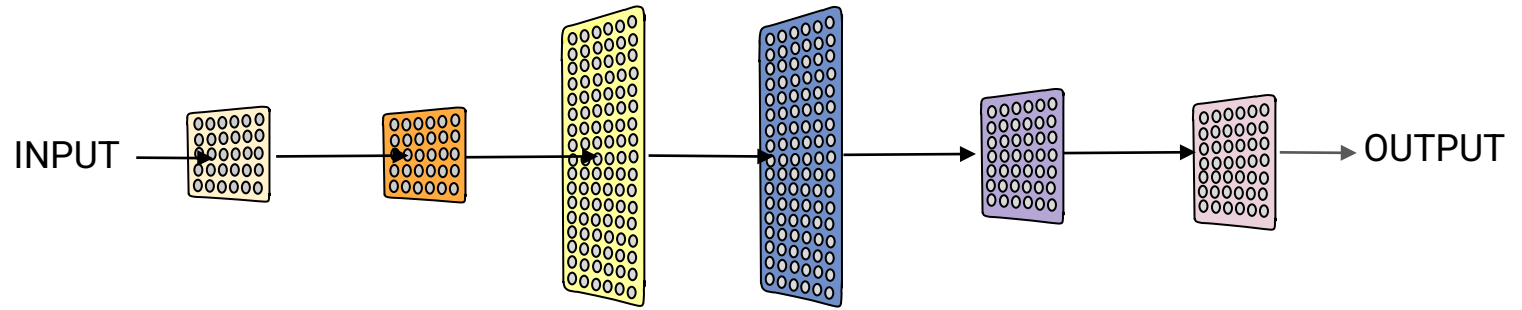
Learning from data

Spam the new way:

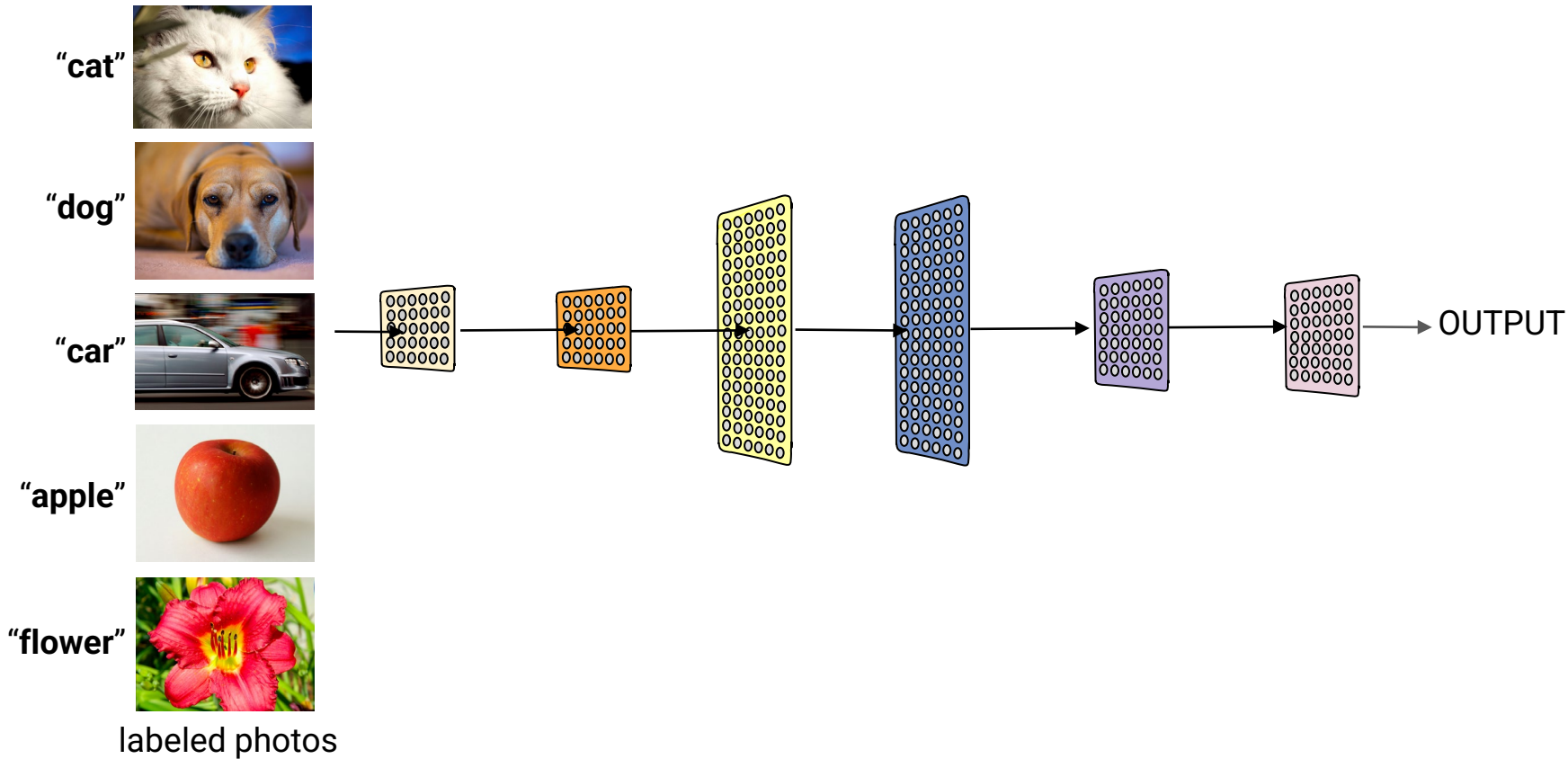
Write a computer program to *learn* from examples

```
try to classify some emails ;  
change self to reduce errors ;  
repeat ;
```

neural network models



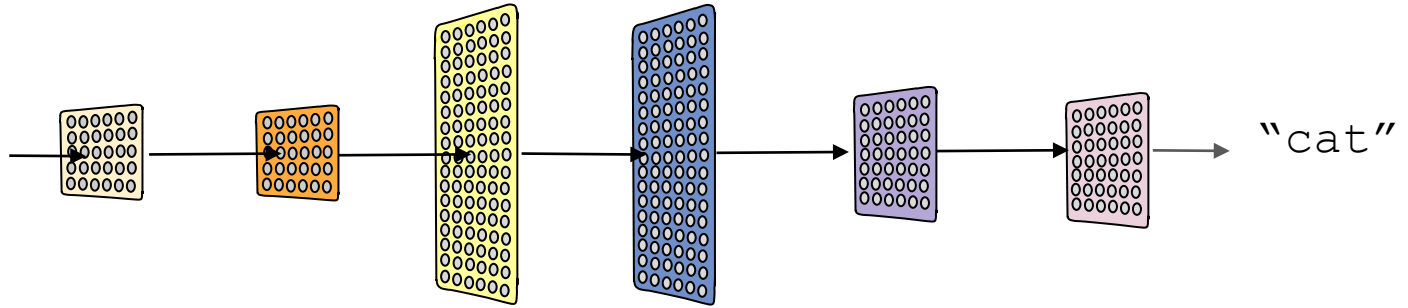
neural nets learn from examples



after a model is trained, you can test it



unlabeled photo



input



output

“cat”

input



output

“stop sign”

functions a deep neural network can learn

input

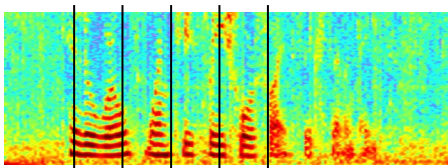
output

Pixels:



“hussar monkey”

Audio:



“How cold is it outside?”

“Hello, how are you?”

“Bonjour, comment allez -vous?”

Pixels:



“A blue and yellow train travelling down the tracks”

AI is used across Google products



Assistant

Query understanding
Conversation



Search

Query understanding
Search ranking



YouTube

Video recommendations
Better thumbnails



Cloud

Cloud ML APIs
TPU



Home

Speech recognition
Conversation



Translate

text and speech
translations



Clips

smart image capture



Gmail

Smart Reply
Spam classification



Photos

Photos / video search
Auto- smile montage



Android

Keyboard input
(also in iOS)



Cardboard

Image stitching



Drive

Quick Access



Maps

Street View images
Parsing Local Search



Ads

Richer Text Ads
Video summarization



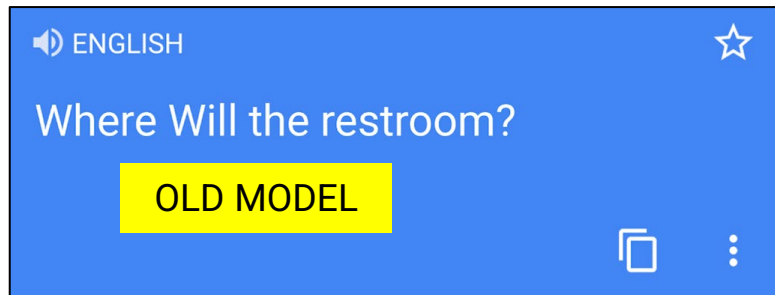
Play

App clustering
Music recommendations

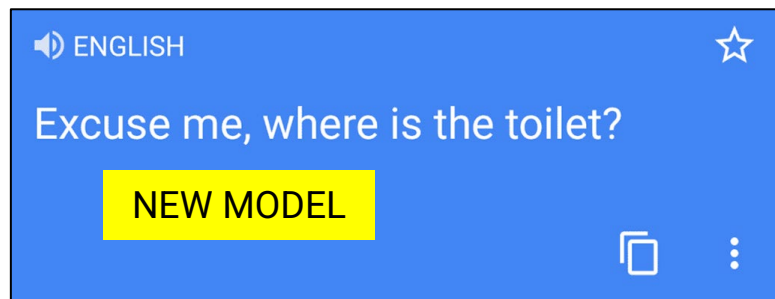
ML has improved Google translate...



The screenshot shows the Google Translate interface. At the top, there is a blue header with the Google Translate logo. Below the header, the source language is set to "Chinese" and the target language is "English". The input field contains the Chinese text "请问，洗手间在哪里？" (Qǐngwèn, xǐshǒujiān zài nǎlǐ?) and the output field shows the English translation "Excuse me, where is the toilet?".



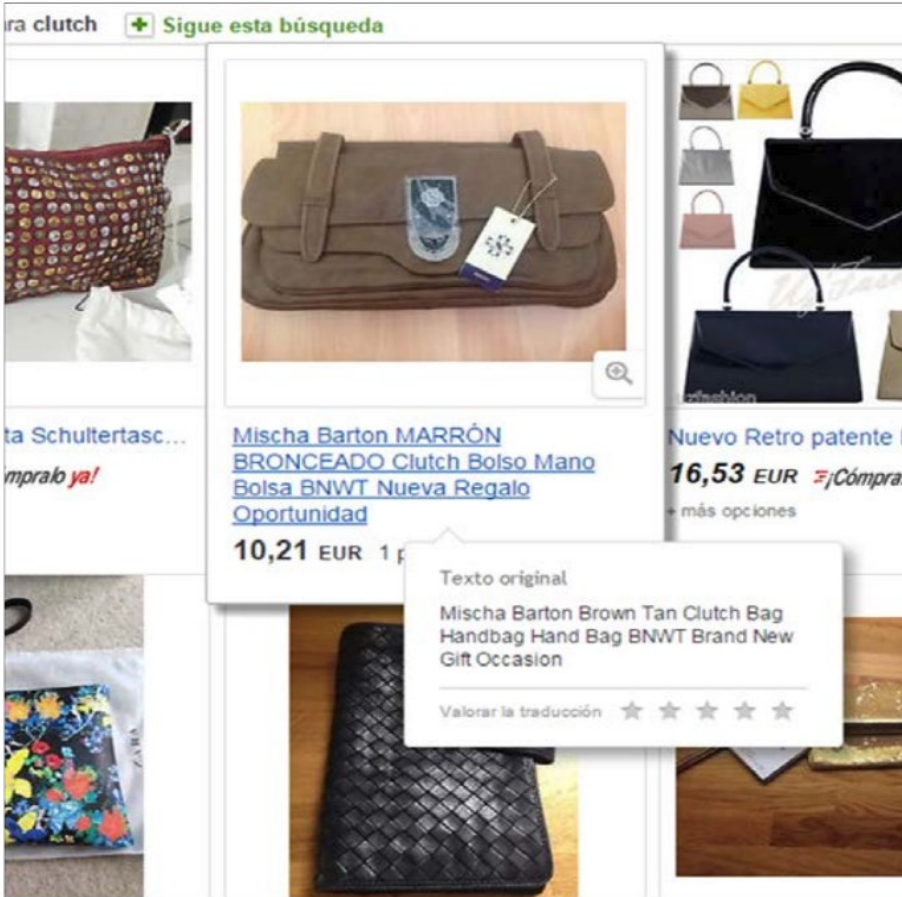
This screenshot shows the output of the old translation model. The source language is "ENGLISH" and the target language is "ENGLISH". The input text is "Where Will the restroom?". The output text is "Where Will the restroom?". A yellow box highlights the text "OLD MODEL".



This screenshot shows the output of the new translation model. The source language is "ENGLISH" and the target language is "ENGLISH". The input text is "Excuse me, where is the toilet?". The output text is "Excuse me, where is the toilet?". A yellow box highlights the text "NEW MODEL".

accurate translation as an enabler of cross -border trade

ra clutch [+ Sigue esta búsqueda](#)



Mischa Barton MARRÓN BRONCEADO Clutch Bolso Mano Bolsa BNWT Nueva Regalo Oportunidad
10,21 EUR 1 p

Nuevo Retro patente B
16,53 EUR [¡Compralo](#)
+ más opciones

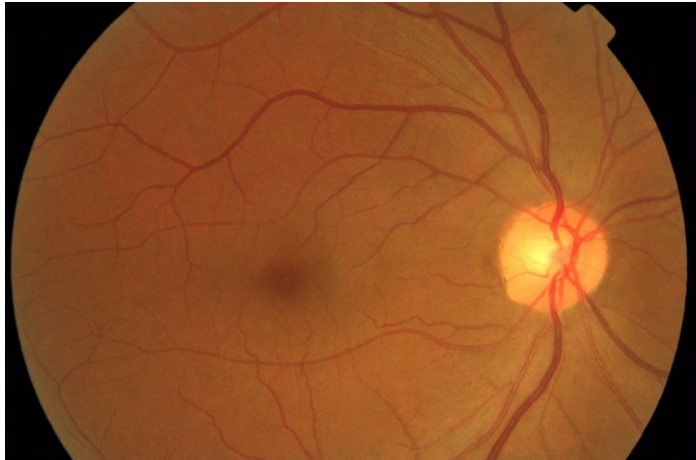
Texto original
Mischa Barton Brown Tan Clutch Bag
Handbag Hand Bag BNWT Brand New
Gift Occasion

Valorar la traducción ★ ★ ★ ★ ★

Source: Brynjolfsson,
Hui & Liu (NBER 2018)

AI used to detect diabetic retinopathy

input



output

Grade of Diabetic Retinopathy

F-score

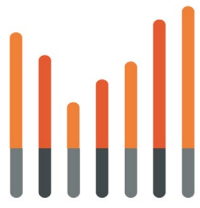
0.95

Algorithm

0.91

Ophthalmologist
(median)

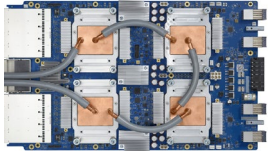
machine learning requires four ingredients



Enough of the right kind of data to serve as training examples



Algorithms and tools to build the model



Computing power to run the model

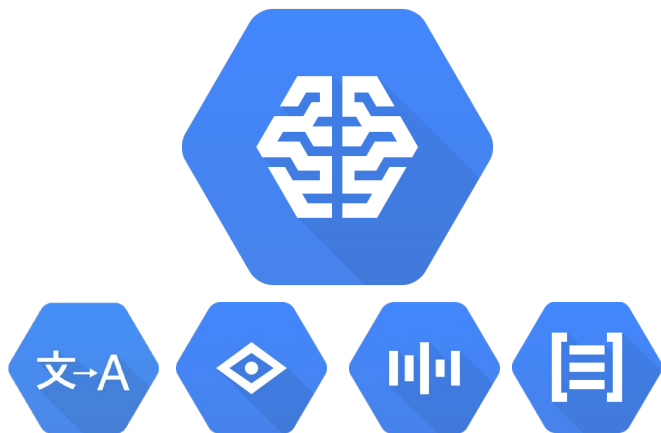


People to design and operate
tech skills + data skills + business expertise

open - source innovation depends on global data sets

Google Cloud AI

APIs, custom ML, TPUs



TensorFlow

open-source machine
learning library



Cross-border data flows and open data sets have enabled new innovations to meet evolving needs during COVID-19....

from Covid -19 forecasting...

Google

COVID-19 Open-Data

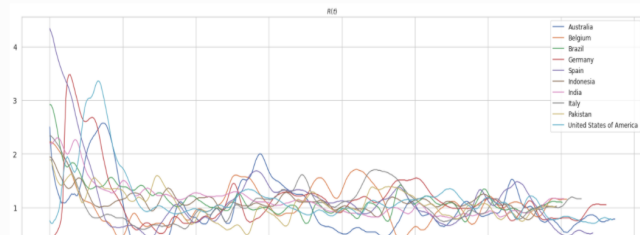
Search for any location

This repository contains the largest Covid-19 epidemiological database available in addition to a powerful set of expansive covariates. It includes open sourced data with a permissive license (enabling commercial use) relating to vaccinations, epidemiology, hospitalizations, demographics, economy, geography, health, mobility, government response, weather, and more. Moreover, the data merges daily time-series from hundreds of data sources at a fine spatial resolution, containing over 20,000 locations and using a consistent set of region keys.

For folks who want to **jump right in...**

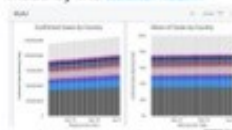


For the research oriented - a data goldmine upon which to perform **ML/AI forecasting, investigations** anchored to myriad covariates, and much more.



A variety of other community contributed visualization tools are listed below.

See the COVID19 Data Block made by the Looker team:



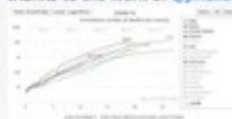
If you want to see interactive charts with a unique UX, don't miss what @Mahks built using the Open COVID-19 dataset:



You can also check out the great work of @quixote79, a MapBox-powered interactive map site:



Experience clean, clear graphs with smooth animations thanks to the work of @jmullo:



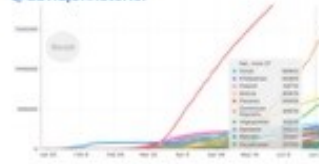
Become an armchair epidemiologist with the COVID-19 timeline simulation tool built by @LeviticusMB:



Compare per-million data at Omnimodel thanks to @OmarJay1:



Look at responsive, comprehensive charts thanks to the work of @davidjohnstone:



Reproduction Live lets you track COVID-19 outbreaks in your region and visualise the spread of the virus over time:



...to vaccine monitoring...




THE VACCINE MONITOR

The World's Most Comprehensive COVID-19 Dataset On Vaccine
Deployment. 90+ economies Tracked. 12+ economies

PRESS RELEASE



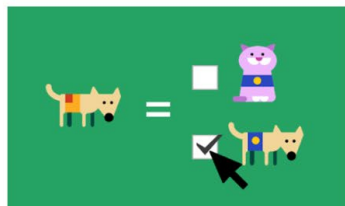
...to new translate functions



Improve Translate

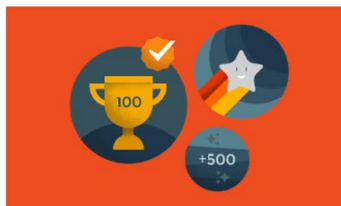
Help improve Google Translate for the languages you speak. Contribute to [Translate Community](#) to help people around the world understand your language a little better.

GET STARTED



Fill-in-the-blank or multiple-choice

We show you a phrase, you type in a translation. Or if you'd rather just click or tap, we'll show you possible translations, and you tell us if they're right or wrong.



Get recognized and earn badges

Contributor, 100 Club, and beyond: every time you help, you get closer to the next badge.



Bring languages to life

Translate Community is a major part of our process to add new languages to Google Translate. If you speak a language we're working on, you can help us add it.

GOOGLE MEET

Live captioning in Google Meet expanding to 4 new languages

