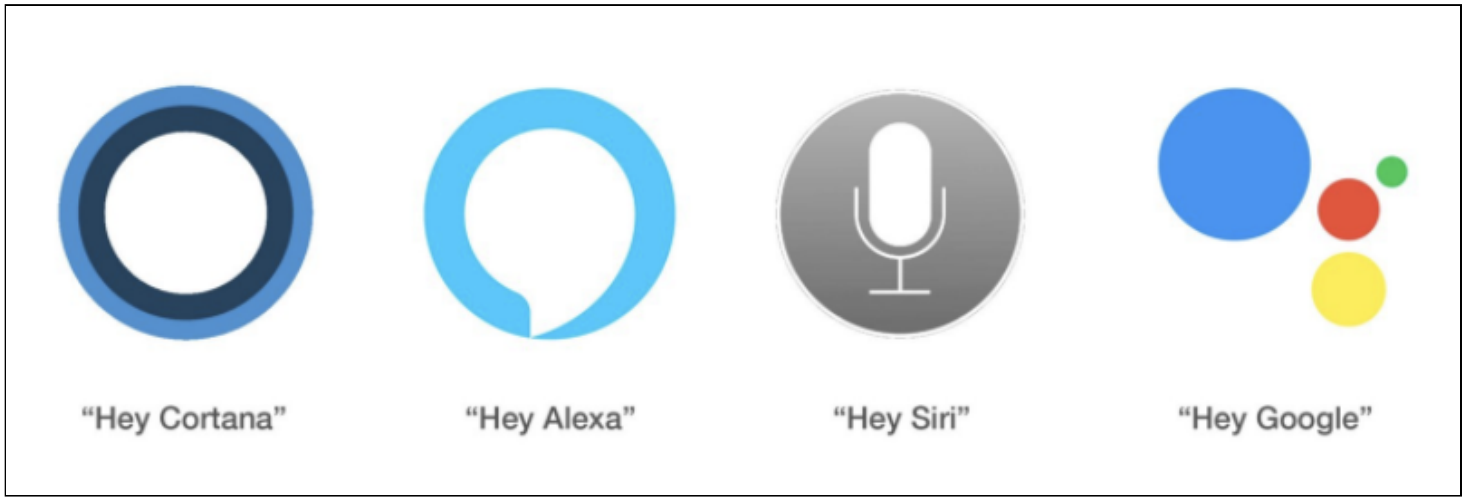
Lecture 24 - Machine Learning Use Cases

We talked about some stuff that ML fails to do well. Real-Estate, Forecasting stock prices etc.

Now let's talk about ML use cases that work. Not stuff that is in the future... but today.

Voice Assistant - Voice Recognition

Voice assistants are all over:



Voice assistants are ubiquitous. Popular ones include:

- Apple's Siri
- Google Assistant
- Google Duplex
- Amazon's Alexa
- Samsung's Bixby
- Microsoft's Cortana

Also voice activated menus. They are super irritating, but they will get better. My wife seems to have a tone/voice that just will not operate them.

An example of Backward Thinking:

From : https://www.gao.gov/assets/gao-19-257.pdf:

"software that uses a training dataset to "learn" how to read information from a form filled out by a person;"

The question is why are we filling out forms on paper at all?

What about combining them. Filling out online forms - especially .PDFs is really irritating on a phone. What about using a voice assistant to fill out forms and keep the data digital.

https://www.tensorflow.org/tutorials/audio/simple_audio

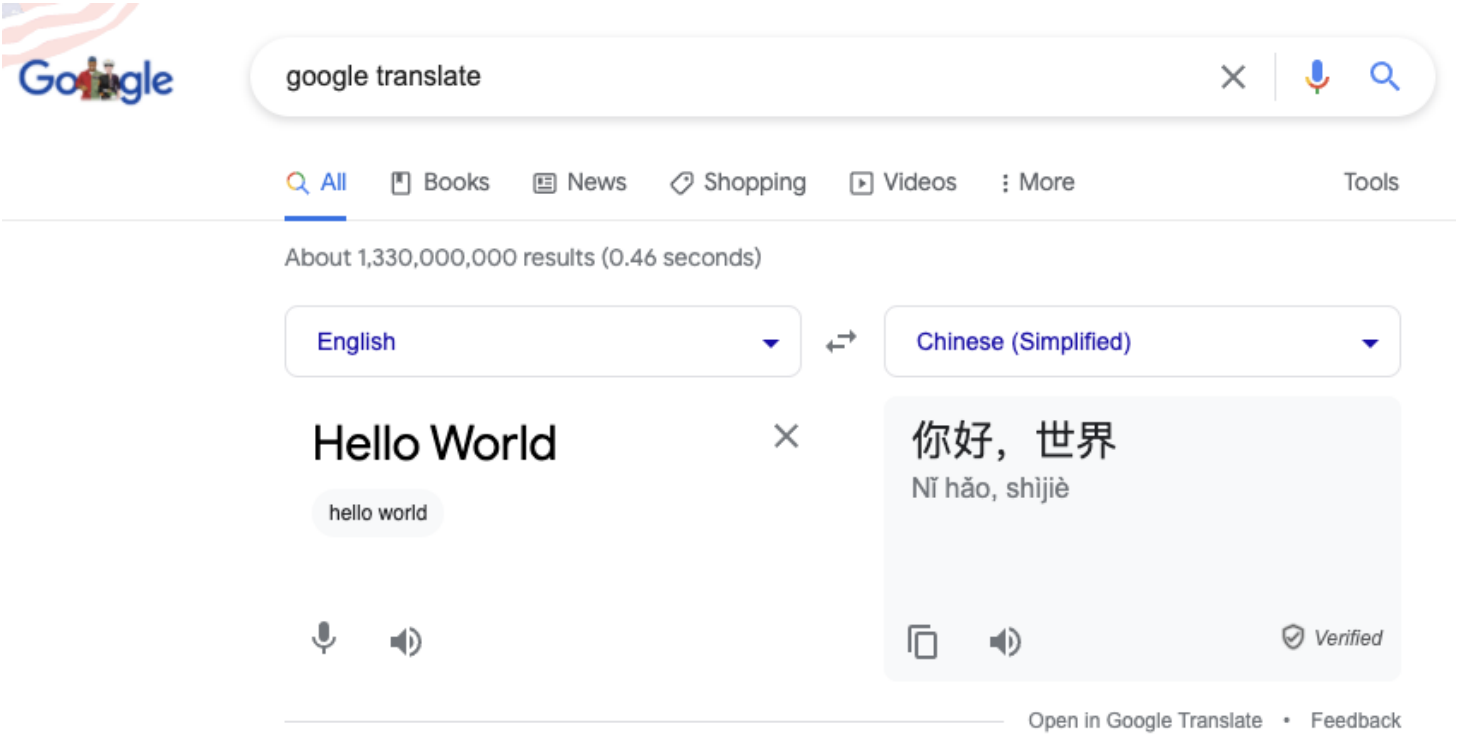
Last semester I trained this exact code to analyze my audio for pre-recorded class lectures - to find the “ums” and “ahs” and “cough” and long silent patches. Then I had a time-index in video to know where to go and edit out bad sections.

Another really good web article on voice recognition:

https://www.analyticsvidhya.com/blog/2019/07/learn-build-first-speech-to-text-model-python/

Language Translation - Google Translate

For people learning languages and for us computer people that just want to test with unicode characters - this is awesome!



There are live translation systems - that will listen and translate on the fly - they work sort of. There are systems that you can talk into and translate to a different language. Most of them are working on speech-recognition combined with the google-translate API.

Taking Better Pictures - Focus

Facial recognition - focus on peoples faces is one part of this. This is not the creepy identification of of individuals - this is just pick out the faces in the image.

https://towardsdatascience.com/building-face-recognition-model-under-30-minutes-2d1b0ef72fda

Depth separation is a 2nd part of this - if you know what is at what depth in the image then you can focus on the “subject” of the picture.

https://www.analyticsvidhya.com/blog/2019/02/tutorial-semantic-segmentation-google-deeplab/

Identification of the “subject” in a picture is another kind of machine learning.

https://www.tensorflow.org/lite/examples/object_detection/overview

Image processing - Better Pictures

Zoom has this now - working on live video. My screen recorder allows this. Kind of slow but it works. Adobe Premiere Pro - has it. You can just tell it to blur the background in images and video.

Security Systems

Lots of stuff with security systems. You may want to detect when an unexpected person is on the parch. This is a “detect” intruder system:

The article on this:

https://towardsdatascience.com/tensorflow-on-edge-or-building-a-smart-security-camera-with-a-raspberry-pi-5bb2fc039b0f

Or when the dog is walking around in your house and not set off the alarm.

The Github for an example animal detector:

https://github.com/gaiar/animal-detector/tree/dev

and a “medium” paywalled article on it:

https://towardsdatascience.com/detecting-animals-in-the-backyard-practical-application-of-deep-learning-c030d3263ba8

Generation of Fake Faces

It used to be true that if you had an image of a person that you probably had a real live perosn: How about this:

This is not a real person. You can buy images like this by the thousands! And the source code is available on github.com!

Maps and Routing - Uber / Google-Maps / Apple-Maps / Waymo-Self driving - routing.

Lots of stuff is based on using ML to optimize transportation.

Routing is one. Google maps.

Dynamic pricing - uber, lyft etc.

Deep Fakes

Fake of Obama.

Detection of Deep Fakes.

deepfake-detect.com site

And the source:

https://github.com/aaronchong888/DeepFake-Detect

Credits

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