Machine Learning sur iOS
Une approche pragmatique

Machine Learning

« champ d'étude de l'intelligence artificielle […] permettant à une machine […] d'évoluer par un processus systématique, et ainsi de remplir des tâches difficiles… »

Wikipedia

Utilisation de données (souvent en quantité importante) pour aider la machine à résoudre des problèmes complexes

Deep Learning

« […] un ensemble de méthodes de machine learning tentant de modéliser avec un haut niveau d'abstraction des données grâce à des architectures articulées de différentes transformations non linéaires »

Wikipedia

Une technique de ML (réseaux de neurones…) ayant pour but de travailler plus particulièrement sur certains types de problèmes

Pourquoi le machine learning ?

Classification d’images

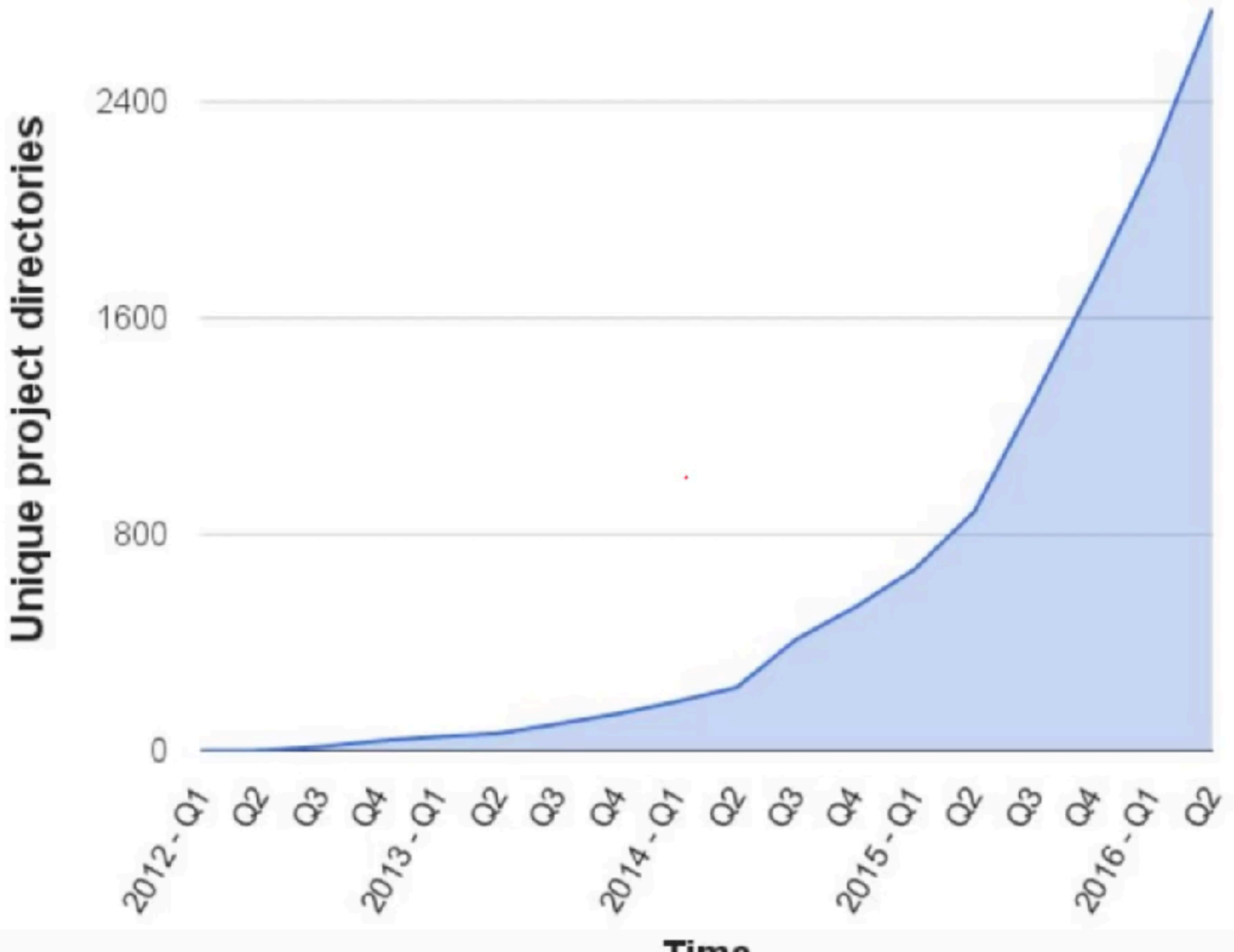
Reco et traitement du langage naturel

Reco audio

…

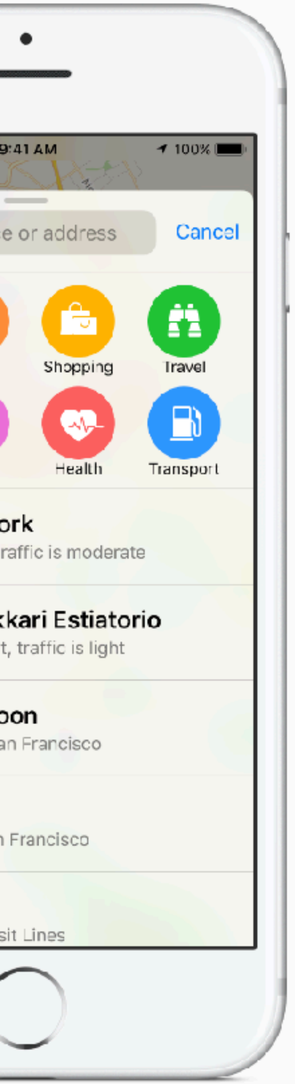
Growing Use of Deep Learning at Google

of directories containing model description files

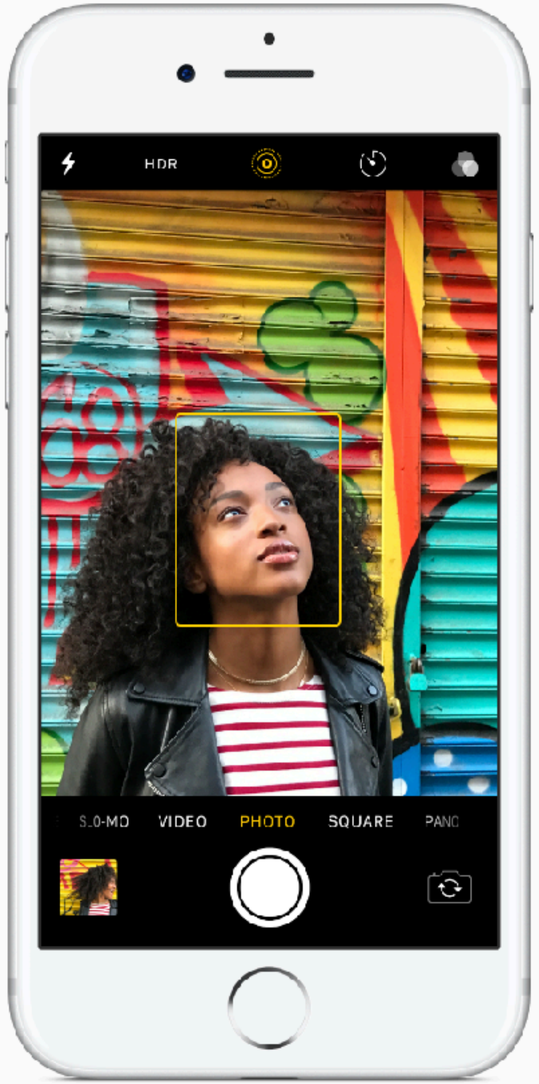


Across many products/areas:

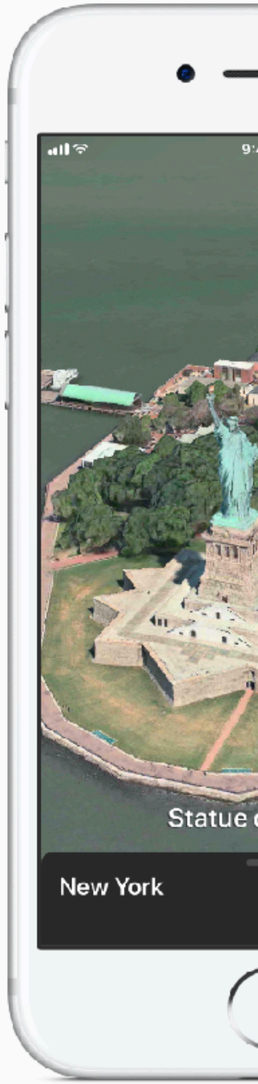
Android
Apps
drug discovery
Gmail
Image understanding
Maps
Natural language understanding
Photos
Robotics research
Speech
Translation
YouTube
… many others …


9:41 AM
100%
e or address
Cancel
Shopping
Travel
Health
Transport
ork
raffic is moderate
kkari Estiatorio
t, traffic is light
oon
an Francisco
n Francisco
sit Lines


9:41 AM
100%
Hey Siri how do you say please take me to the airport in Chinese
Tap to Edit
TRANSLATION
English
Please take me to the airport
Chinese (Traditional)
请带我去机场
qǐng dài wǒ qù jī chǎng


HDR
SLO-MO
VIDEO
PHOTO
SQUARE
PANO


9:41 AM
100%
Wayne
I had plans, but they got cancelled. What's up?
Great! I have an extra ticket to the all-star game this weekend.
Really? 👀
Delivered
Yes! Wanted to see if you were interested in going?
Are you serious?? Of course I'm in
"in"
interested
inside
space
return


New York

Vocabulaire

Classification

Regression

Clustering

Training

Algorithme

Model

Data

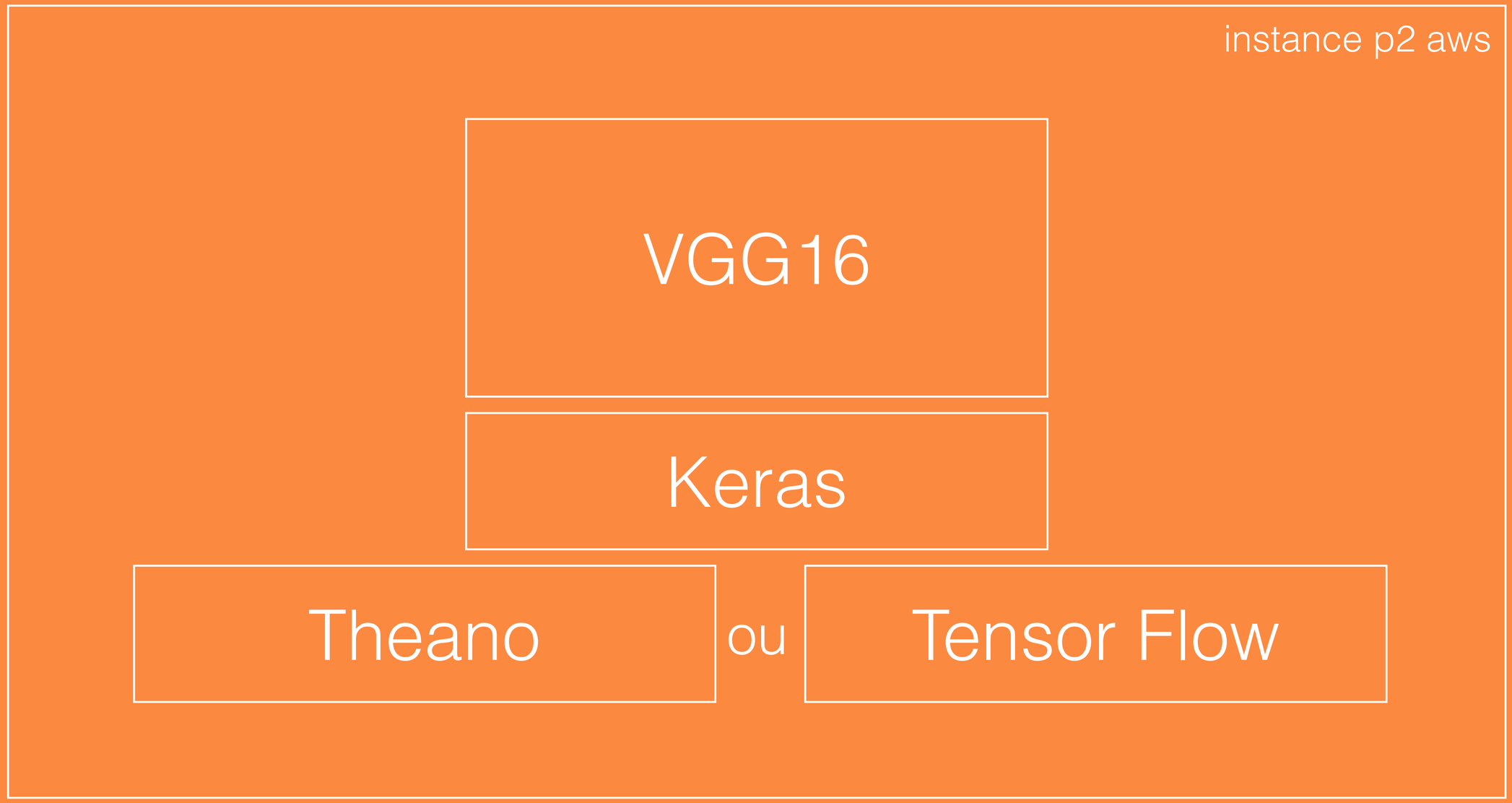
+ Algo = MODEL

Training (offline)

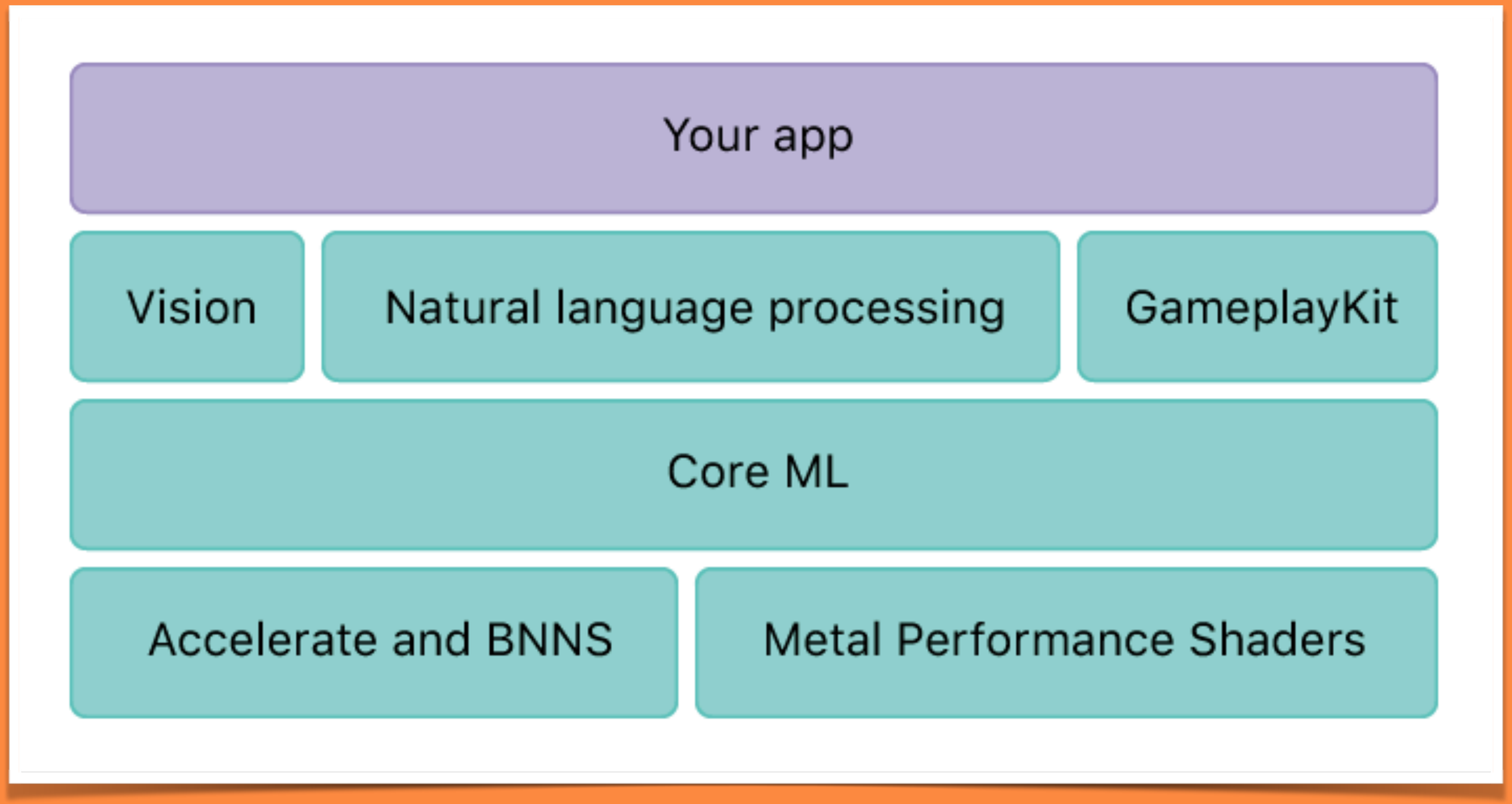
Model = Algorithm(TrainingData)

Models pour la classification (Kaggle ou ImageNet)

VGG16
VGG19
Inception v3
…



Architecture VGG16



Core ML et Vision sur iOS 11 (impasse sur le Natural Language Processing)

Vision Framework

Face detection, observation

Barcode detection

Text Detection

Horizon angle detection

Rezctangle detection

…

	Vision	Core Image	AV Capture
Accuracy	Best	Better	Good
Processing time	Fast	Faster	Fastest
Power usage	Good	Better	Best
Availability	iOS, macOS, tvOS	iOS, macOS, tvOS	iOS capture only

CORE ML

Des models open sources

https://developer.apple.com/machine-learning/

Working with Models

Build your apps with the ready-to-use Core ML models below, or use Core ML Tools to easily convert models into the Core ML format.

Models

MobileNet

MobileNets are based on a streamlined architecture that have depth-wise separable convolutions to build lightweight, deep neural networks.

Detects the dominant objects present in an image from a set of 1000 categories such as trees, animals, food, vehicles, people, and more.

View original model details

Download Core ML Model (17.1 MB)

SqueezeNet

Detects the dominant objects present in an image from a set of

« Ils ne savaient pas que c’était impossible, alors ils l’ont fait »

Mark Twain

Sources

course.fast.ai

Doc apple Core ML

Raywenderlich (iOS 11 by Tutorials)

WWDC 2017 Core ML

https://github.com/jeffreybergier/Blog-Getting-Started-with-Vision