

DEEP LEARNING & MUST @LISTIC

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LISTIC

Scientific context

Multimedia



350 millions photos are uploaded **daily**

100 hours of videos are uploaded every **minute**: **2 billions** each year

1.4 millions of minute chats are saved every **minute**

Specific Fields

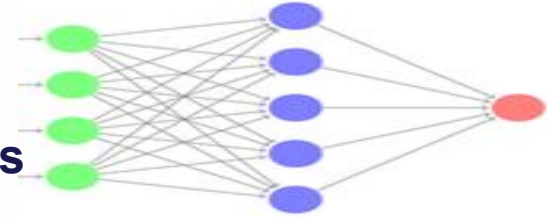
Medical Imaging....

Remote Sensing and Astrophysics:
Terabytes of data per day.

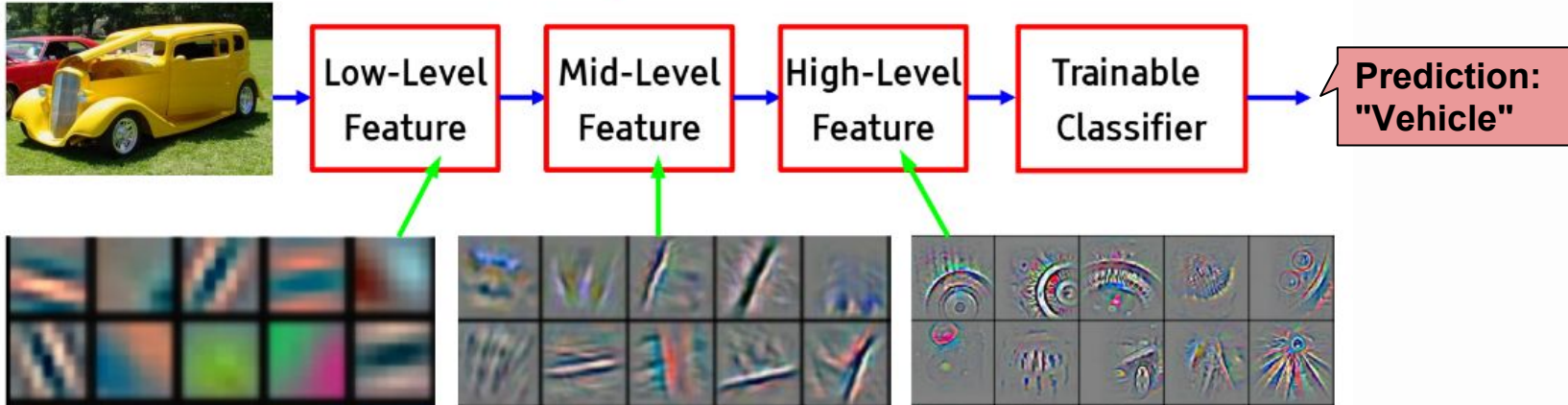
Deep Learning ?



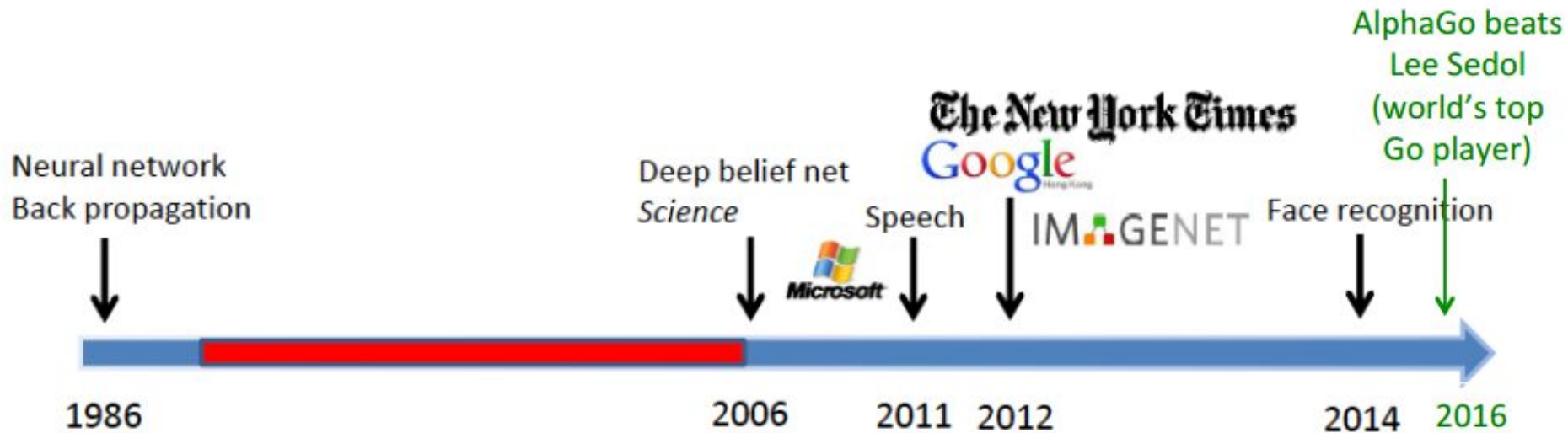
Modelling high level abstractions
from multiple non linear transformations



It's **deep** if it has **more than one stage** of non-linear feature transformation



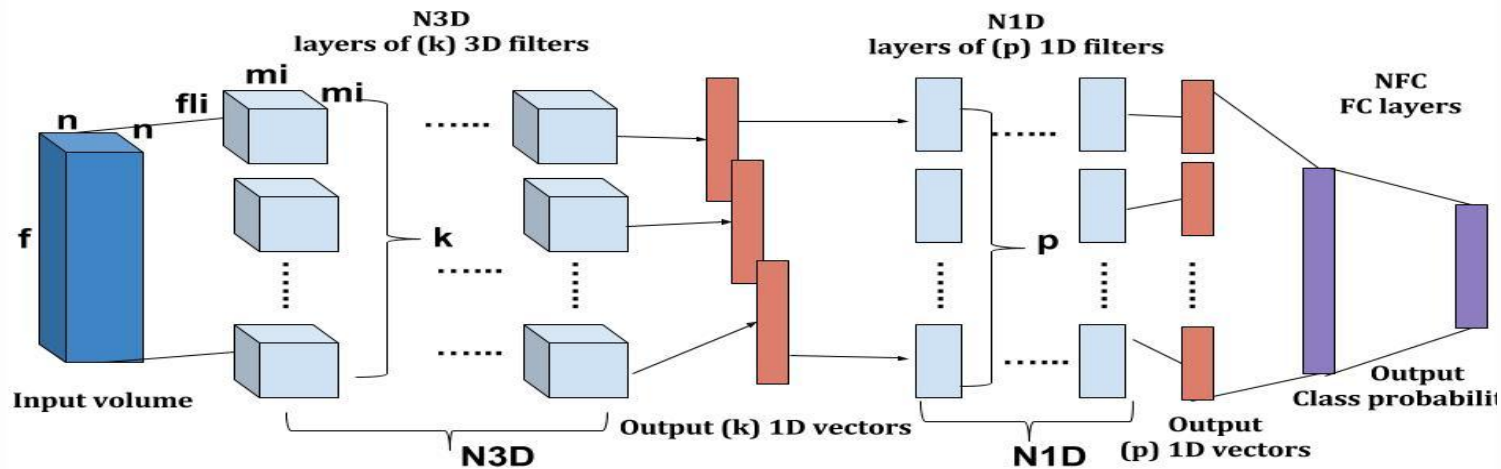
Deep Learning history



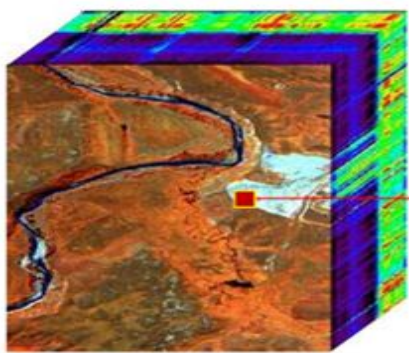
Deep learning @LISTIC

Developing new architectures adapted to new problems:

- Supervised learning with large known datasets
- Un/Semi supervised approaches when few knowledge available



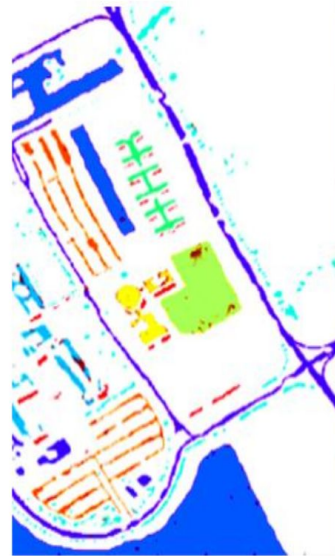
Remote Sensing, pixel level classification



Hyperspectral Data Cube



A Pixel Vector



Asphalt
Meadows
Gravel
Trees
Painted metal sheets
Bare Soil
Bitumen
Self-Blocking Bricks
Shadows
Misclassified

Method : Deep BUT light 3D network (8 layers, ~6000 parameters)

Results : 98% accuracy ~State of the art but more efficient

Person detection, pixel level classification



Method : Deep recurrent neural networks
Results : 69.6% IoU > State of the art

LISTIC, EDYTEM and
REGIM labs collaboration.

DeepLearning in your basket

The aim : Obtain essential and accurate consumption statistics

The only written proof of this data can be found in sale receipts



**CIFRE thesis:
LISTIC & AboutGoods**



The challenge :

Automatically read a sale receipt from a picture taken by a smartphone and extract the following information :

- ✓ Store Location,
- ✓ Purchase data and time,
- ✓ List of purchased products and their price,
- ✓ Identify any discounts,

Target detection @ TRECVID

Find a **person** in a **specific location** from few samples

exemple (BBC eastenders): "in a 800h video database find **Stacey** in **cafe1**"

Living room

Cafe

Dot

Stacey

IRIM Team
ranked 2nd !

Location samples

Person samples

Going further with DeepLearning

New projects with LISTIC and partners:

Sea surface oil detection @TOTAL

Comfort&consumption analitics @LOCIE

Gamme rays detection®ression @LAPP

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**A lot of work enabled by the computing power provided by
MUST !**