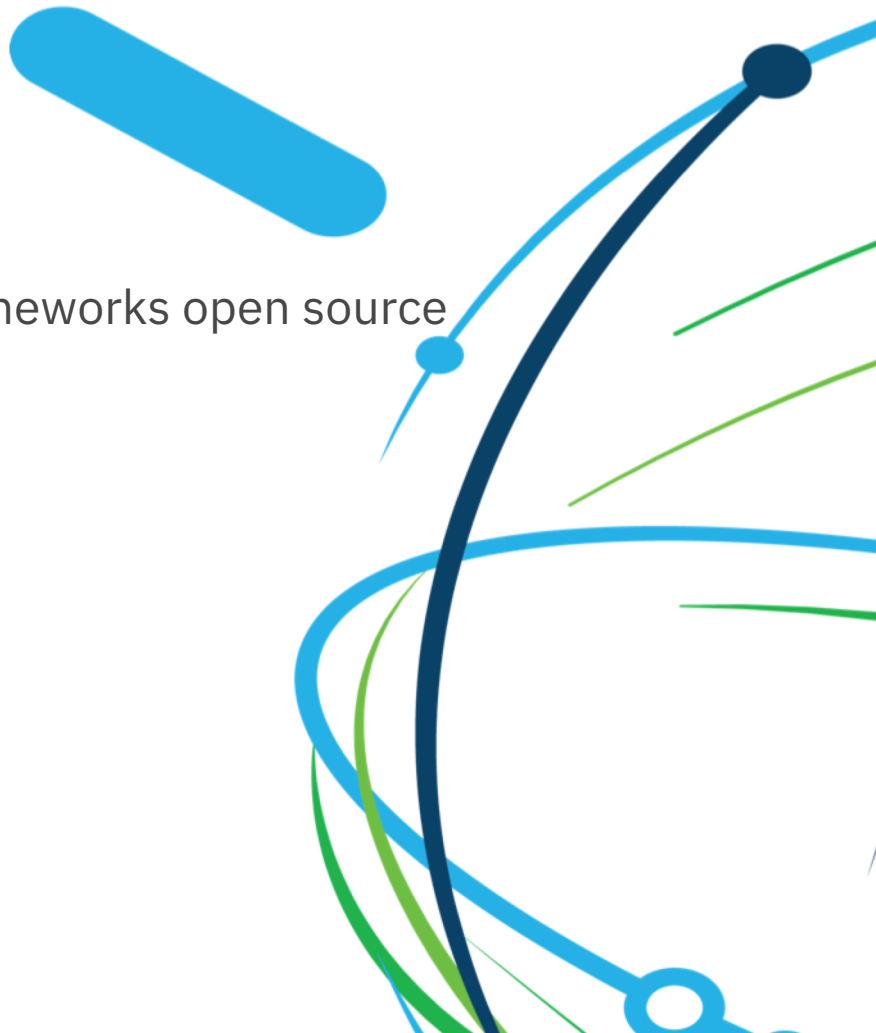


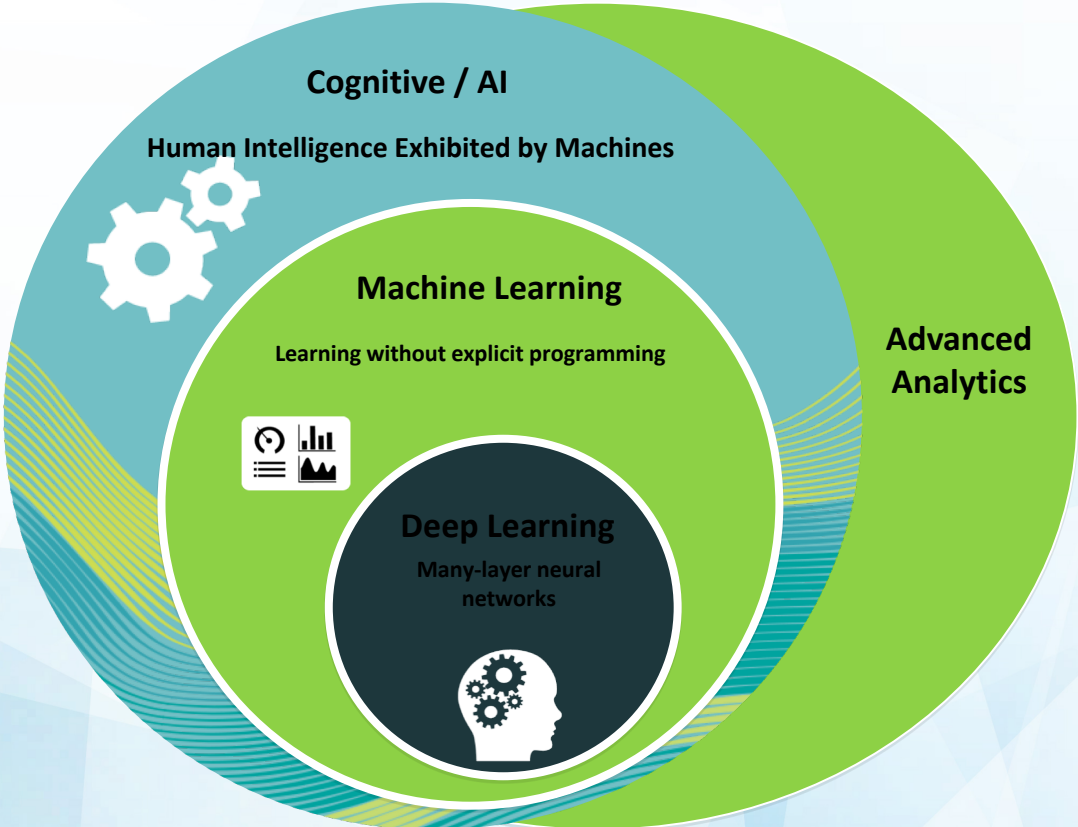
POWERAI

Solution Cognitive basée sur les grands frameworks open source

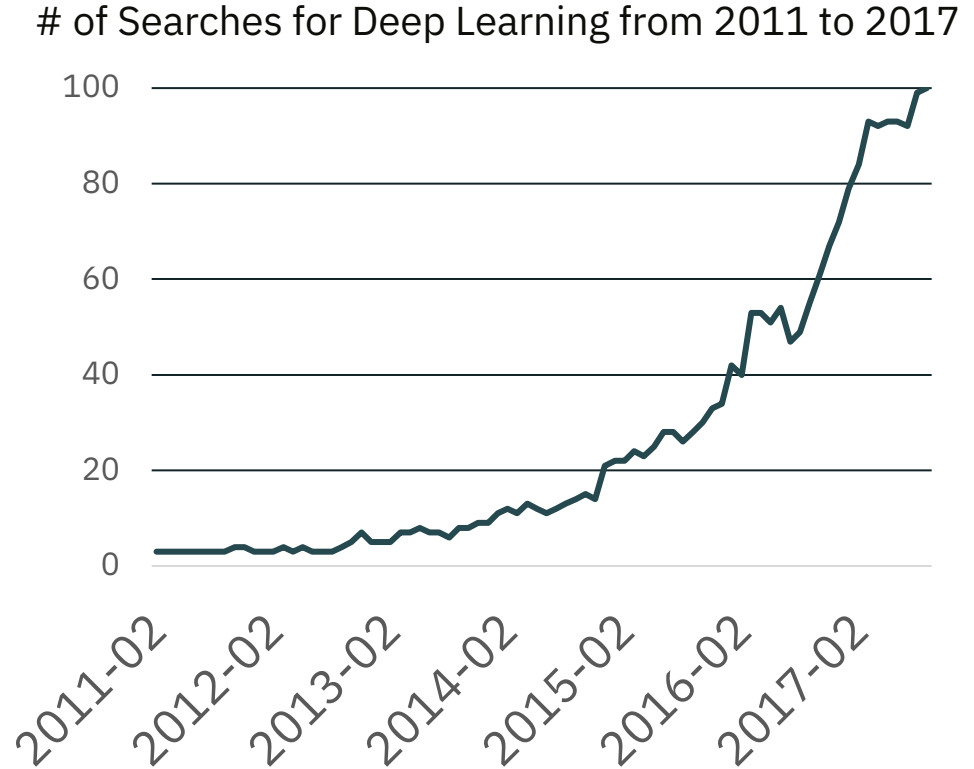
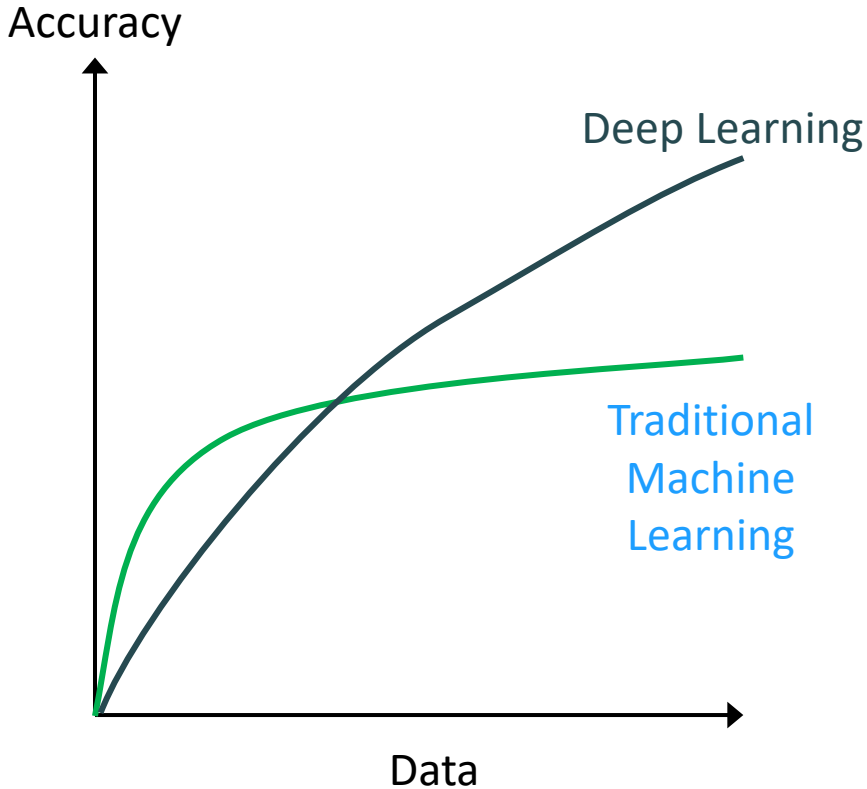
Laurent Vanel
Cognitive Systems Technical Leader
Laurent.vanel@fr.ibm.com



AI/ Cognitive progresse grace au Deep Learning



Deep Learning vs Machine Learning



Source: Google Trends. Search term "Deep Learning"

Le Cognitive s'applique à toutes les industries



AUTOMOTIVE

Self-driving cars,
Driver safety,
Insurance



COMMUNICATIONS

Location-based advertising,
Speech processing



CONSUMER PACKAGED GOODS

Sentiment analysis
of
what's hot, product
positioning



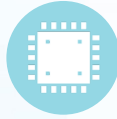
FINANCIAL SERVICES

Risk, fraud, surveillance,
product opportunities



EDUCATION & RESEARCH

Interactive learning



HIGH TECHNOLOGY / INDUSTRIAL MFG.

Robotics, Mfg. quality,
Warranty analysis



LIFE SCIENCES

Drug reactions, drug
discovery



MEDIA/ENTERTAINMENT

Viewers / advertising
effectiveness



ON-LINE SERVICES / SOCIAL MEDIA

Dialogue, image
processing, sentiment



HEALTH CARE

Patient monitoring,
diagnostics



OIL & GAS

Exploration,
simulation efficiency



RETAIL

Consumer sentiment
Demand forecasting



TRAVEL & TRANSPORTATION

Traffic and safety
management



UTILITIES

Smart Meter analysis
for network capacity,



LAW ENFORCEMENT & DEFENSE

Threat analysis - social
media monitoring, photo
analysis

Exemples de prediction d'index

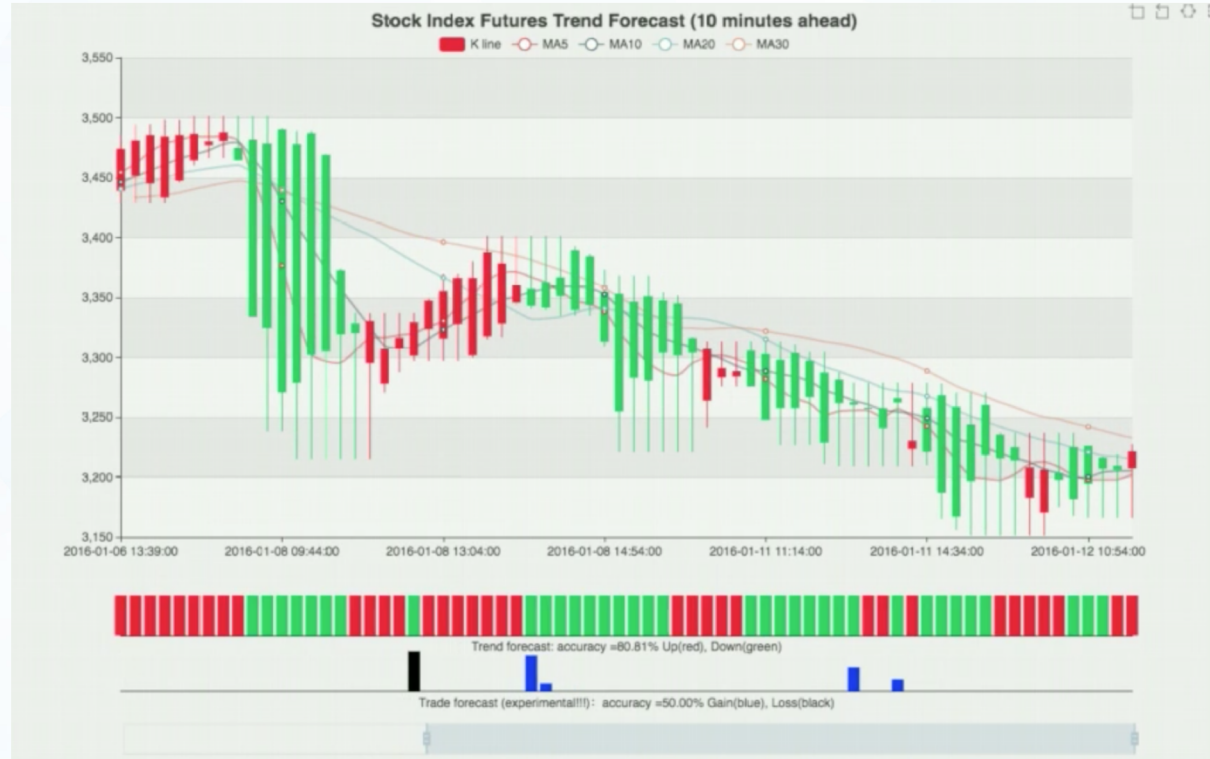
Workload ▾ Resources ▾ System & Services ▾ Reports & Logs ▾

Deep Learning

Datasets Model Templates Models Monitor

Import ▾ Remove

Lmdb	DBBackend	\$
TFRecords	Rawdata	f
Image for Classification	LMDB	f
Raw data	CSV	f
CSV	CSV	f
Image for Object Detection	LMDB	f
<input type="radio"/> mitoes	ObjectDetection	f
<input type="radio"/> qing3	ObjectDetection	f
<input type="radio"/> qq22	ObjectDetection	f
<input type="radio"/> swttest	LMDB	f
<input type="radio"/> swttest-tf	TFRecords	f
<input type="radio"/> t1	LMDB	f



Domaine Industriel (Solar Panel Quality Classification)

Business Requirement

- Automatically solar panel quality classification and interact with the product line
- Picture sizes are not same and the resolution is around 3k*3k which is not good for direct training

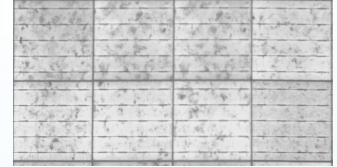
Challenge

- Shorten the training duration
- Data distribution is not uniform

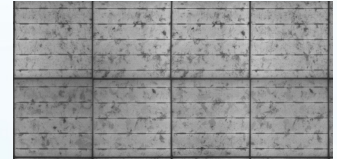
Value

- Bottle-neck training achieve 86% accuracy (100G data is around 4 hours)
- VGG19 + Caffe fully training achieve 89% accuracy (Full training around 4 hours)
- Combine with machine learning method to improve the yield rate

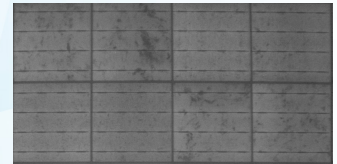
Q0



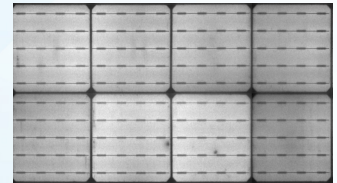
Q1

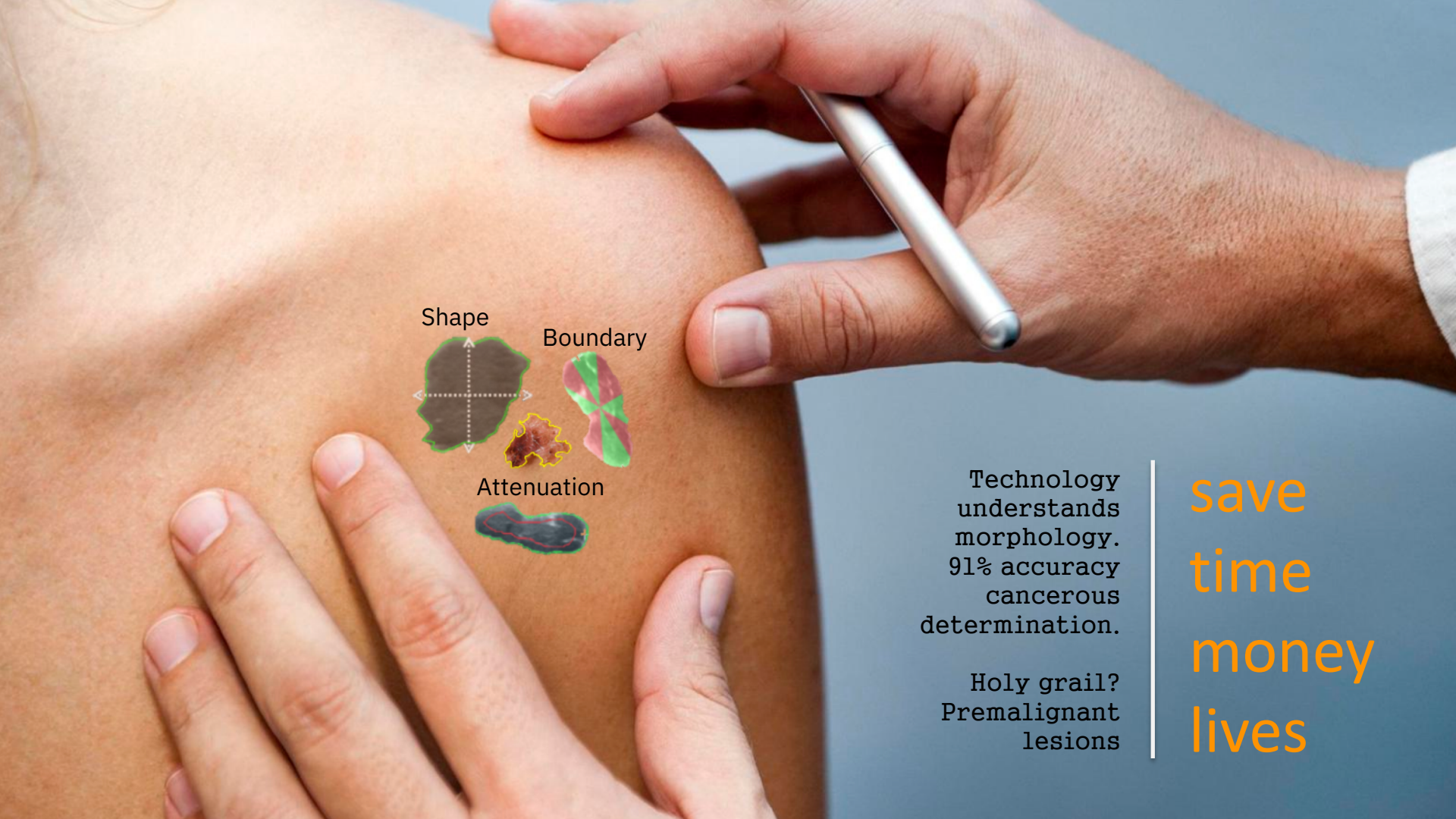


Q2



NG





Shape

Boundary

Attenuation

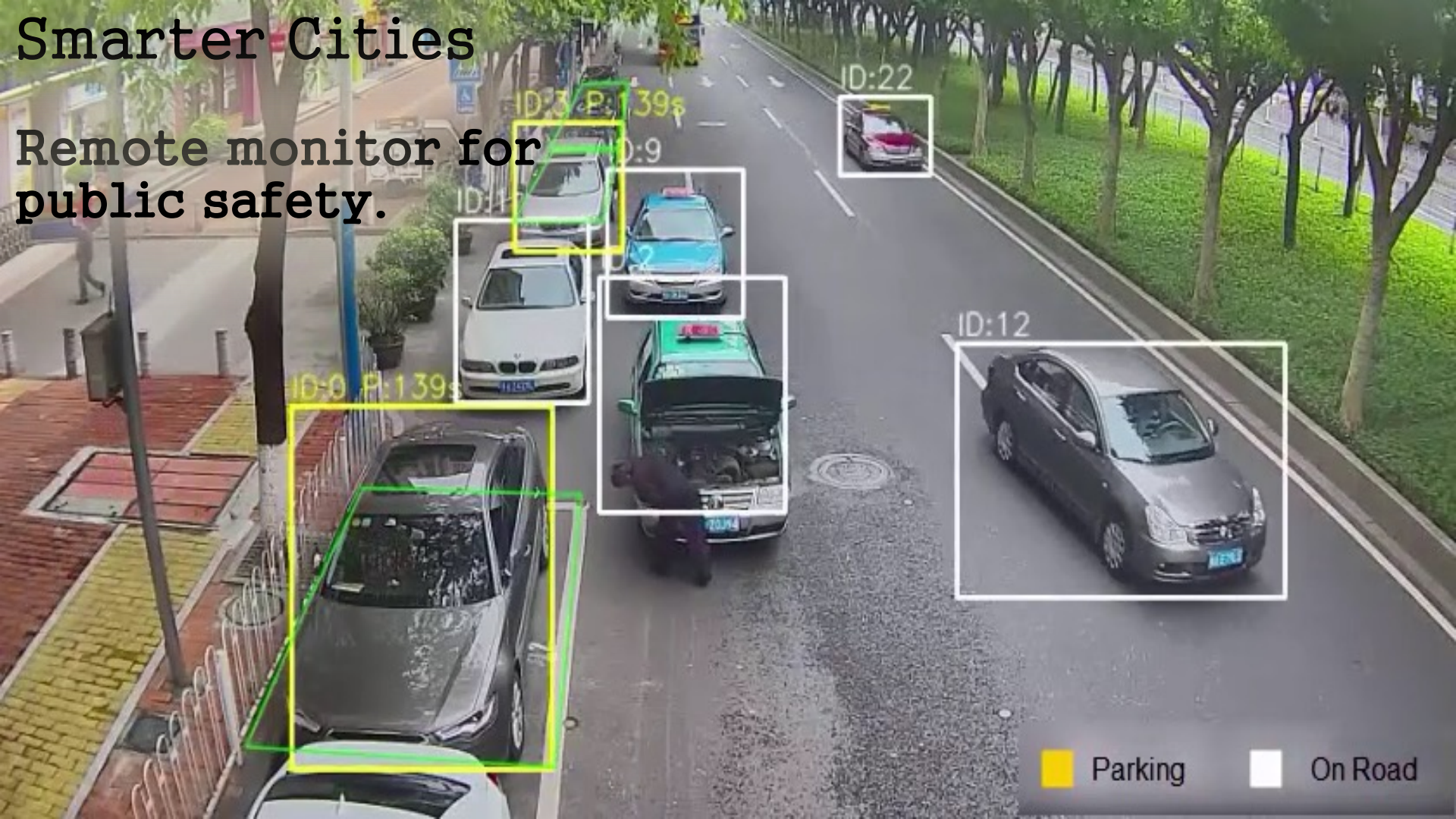
Technology
understands
morphology.
91% accuracy
cancerous
determination.

Holy grail?
Premalignant
lesions

save
time
money
lives

Smarter Cities

Remote monitor for public safety.



ID:0 P:139\$

ID:3 P:139\$

ID:9

ID:14

ID:22

ID:12

■ Parking ■ On Road



90%
inspection
times



10X
number of
inspections



accident
risk
rate



IBM PowerAI



KEPCO
KEPRI

Improved

Accuracy of Risk analysis in credit application process

Increased

Capital available for Investment and other revenue-generating opportunities

Decreased

Time to respond to clients. Inference in real time shortens approval time for all clients, improving the customer experience

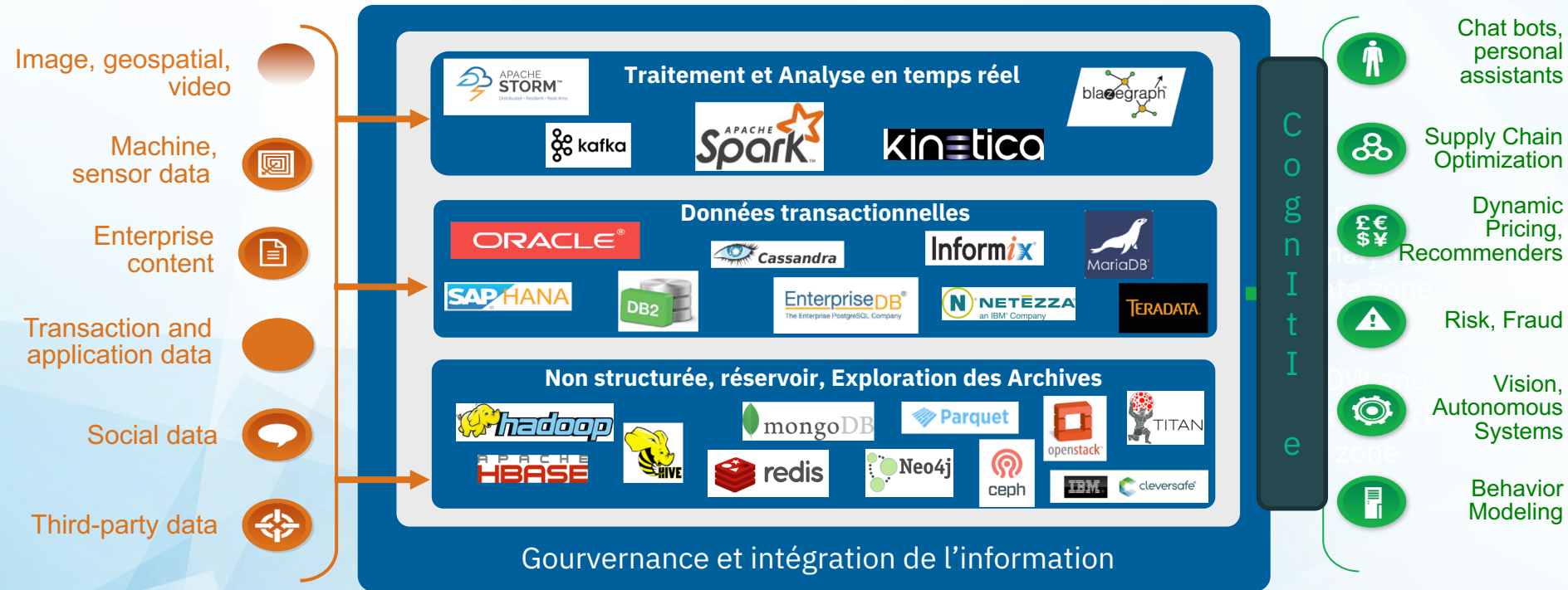
Large Bank Credit Risk Analysis



- A major bank in Oceania is seeking to apply deep learning to the credit risk analysis for credit card applications. Their main goal from this undertaking is to explore options to add self-learning capabilities to the current credit risk marking process.
- By using deep learning to improve the accuracy of risk analysis, the bank can determine how much capital needs to be held to cover that risk.
- Even an improvement of just 1% accuracy in marking credit risk would reduce their capital holding requirements, allowing the freed up capital to be invested, generating more income for the bank and it's account holders.

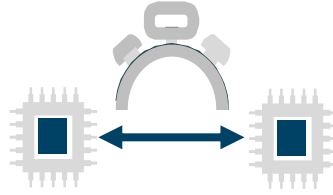


Evolution data/big data/cognitive

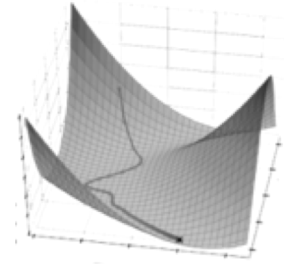




**Une distribution
Intelligence artificielle
pour les entreprises incluant
le support de la solution**



**Des performances pour
racourcir les
étapes d'apprentissage**



**Des outils
pour simplifier
Vos développements**

IBM PowerAI +



**IBM
Spectrum
Computing**



Une solution performante et supportée

IBM PowerAI Platform

PowerAI Software Distribution

Deep Learning Frameworks

Caffe

 Caffe

IBM Caffe

 torch

 TensorFlow™

theano

 Chainer

Supporting Libraries

DIGITS

OpenBLAS

Distributed Frameworks

Bazel

NCCL

IBM Power System for HPC, with NVLink

Breakthrough performance for GPU accelerated applications, including Deep Learning and Machine Learning.

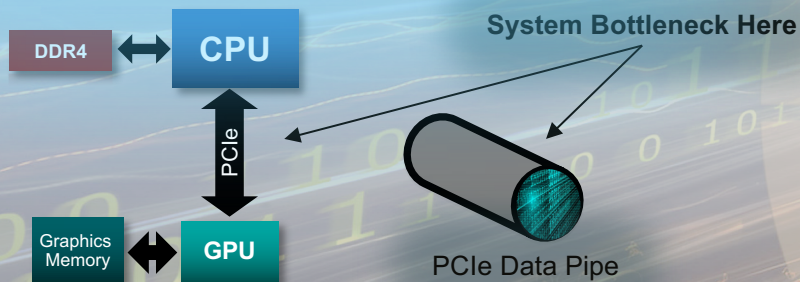




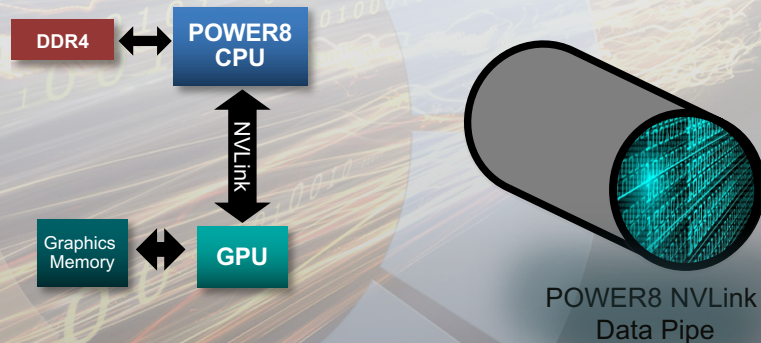
Exploitation des technologies les plus avancées : OpenPOWER + GPU

 **THE NEXT PLATFORM**

THE SYSTEM BOTTLENECK SHIFTS TO PCI-EXPRESS



*POWER8 with NVLink
delivers 2.8X the bandwidth*



Distribution de l'exécution sur plusieurs serveurs



Shape Boundary
Attenuation
Recognition

9 Days

Shape Boundary
Attenuation
Recognition

4 Hours
4 Hours
4 Hours
4 Hours
4 Hours
4 Hours
4 Hours
4 Hours

What will you do?
Iterate more and create more accurate models?
Create more models?
Both?

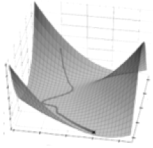
4 Hours
4 Hours
4 Hours
4 Hours

100x

Learning runs with Power 9*

54x

Learning runs with Power 8



PowerAI Vision: Une approche plateforme de bout en bout

Vision Recognition Layer

Image Labeling and Preprocessing



Video Labeling Service



Custom Learning for Image Classification



Custom Learning for Object Detection



Self-defined Training with visualized monitoring



Inference API deployment



Service Management Layer

Image preprocessing management

Data label management

Data set management

Training task management

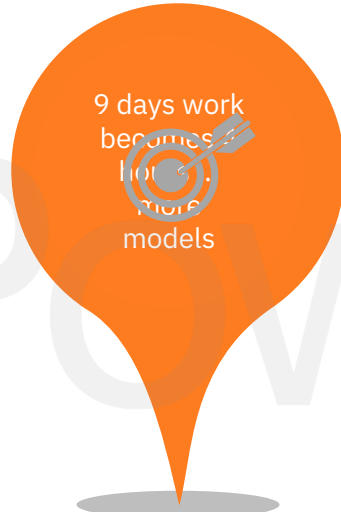
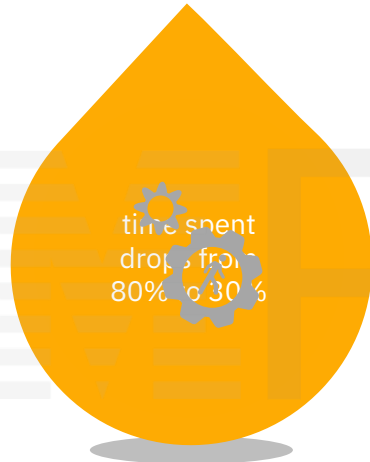
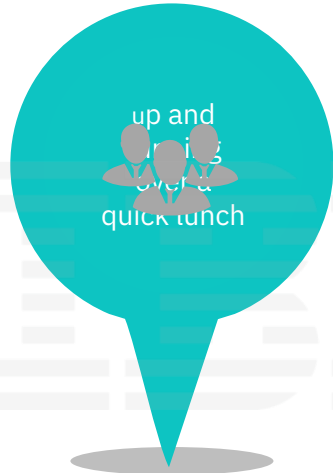
Model management

Inference API management

Que Devez Vous Retenir sur POWERAI

DATA PREPARATION

most time spent here



DEPLOY & INFER

requires different skills



UP & RUNNING

weeks to months

BUILD, TRAIN, OPTIMIZE

very iterative

MAINTAIN ACCURACY

experience all that pain again