
QNAP
Container Station
QNAP & AI
Artificial Intelligence
Reasoning
QuAI
AI Developer Package

Everyone is talking about AI

"IF ONE PERSON COULD PUSH A BUTTON AND TURN OUT EVERYTHING WE TURN OUT NOW, IS THAT GOOD FOR THE WORLD OR BAD FOR THE WORLD?"

-Warren Buffett, CEO

Elon Musk: 'Robots will be able to do everything better

Catherine Clifford | 12:23 PM ET Mo

"AI is going to disrupt every single business app – wheth
industry vertical like banking, retail and health care, or a
business process like sales, marketing and customer suppo

- Harry Shum, Microsoft Executive VP, AI and Research

Warren Buffett and Bill Gates think it's 'crazy' to view job-stealing robots as bad

Catherine Clifford | 9:24 AM ET Fri, 3 Feb 2017

Apple, Samsung, L
'double down' on C

By **Kyle Wiggers** — Posted on January 24, 2017 8:06 am

"Artificial intelligence would be the ultimate version of Google. The ultimate search
would understand everything on the web. It would understand exactly what you wanted, an
would give you the right thing. We're nowhere near doing that now. However, we
incrementally closer to that, and that is basically what we work on."

"WITH AI ESPECIALLY, I AM REALLY OPTIMISTIC."

-Mark Zuckerberg, founder and CEO of Facebook

SYDNEY, Australia, July 18, 2017

Gartner Says AI Technologies Will Be in Almost Every New S
Product by 2020

QNAP QuAI

The AI Era is here…











amazon alexa



IBM Watson







Google ASSISTANT

Siri







AI/ML/DL: the buzzwords…

AI
Artificial Intelligence



Artificial intelligence is a branch of science which is into making machines think like humans.

ML
Machine Learning



Machine Learning is a collection of algorithms that can learn from and make predictions based on recorded data, optimize a given utility function under uncertainty, extract hidden structures from data, and classify data into concise descriptions.

DL
Deep Learning



Deep Learning is a branch of machine learning that involves layering algorithms in an effort to gain greater understanding of the data.

Ride the AI wave with "QuAI" from QNAP

QuAI AI Developer Package

Is intended for **data scientists and developers** to quickly build, train, and optimize their **AI Models** on QNAP NAS.



AI

+



QNAP NAS

=

QuAI

Who is it for ?

Data Scientists



Engineers



Students

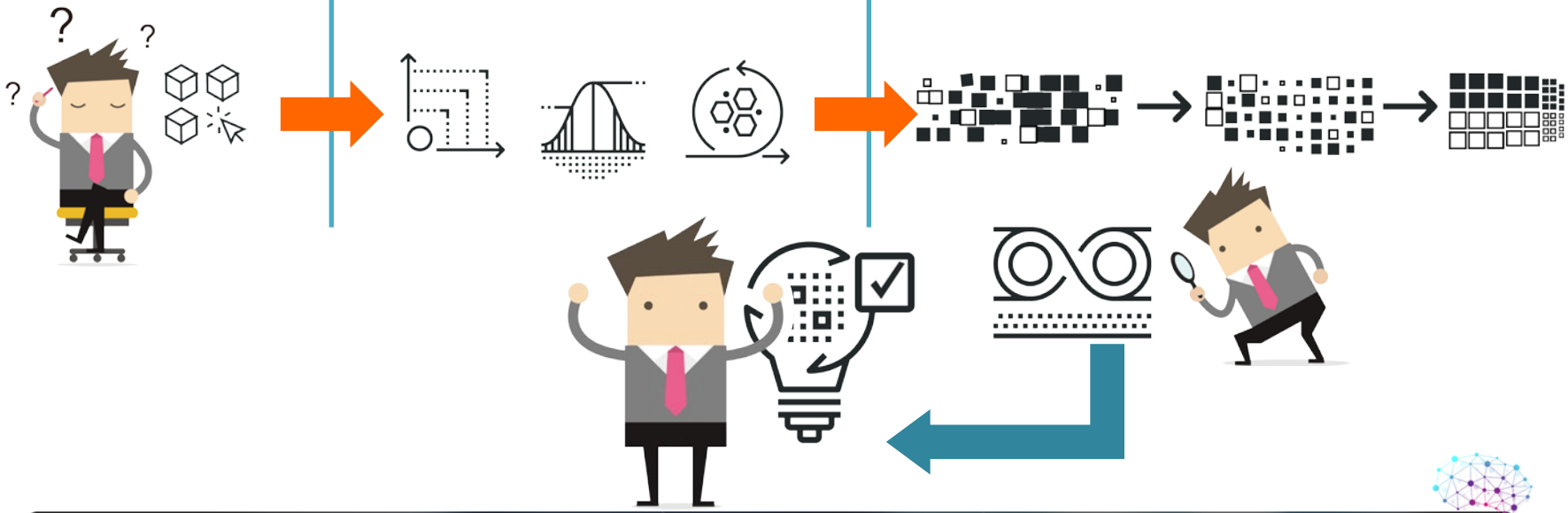


Deep Learning Application Development Process

Data Scientist is presented with business goal

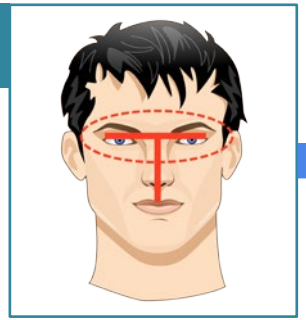
He puts together dataset and target to accomplish that business goal

He goes through iterative process to build and optimize models/algorithms



What's the differences between ML and DL?

ML



Fixed

Manual determination

(f1, f2, … fk)

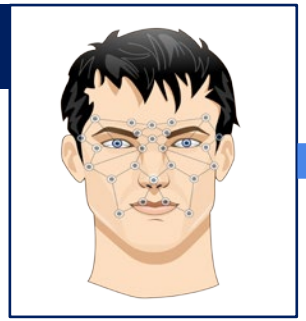
Training

Classifier

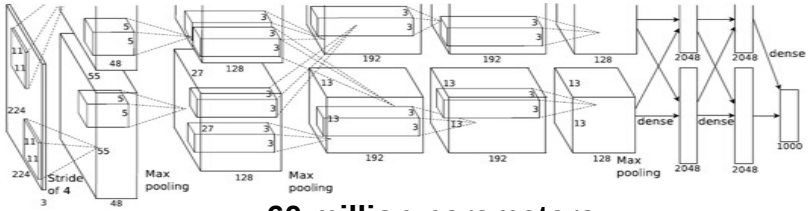
SVM / Random Forest
Naive Bayes / Decision Trees
Logistic Regression
Ensemble Methods



DL



Training



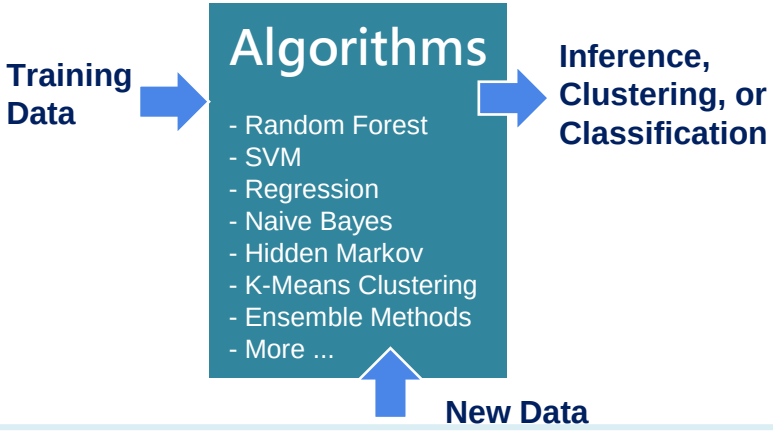
~ 60 million parameters



What is difference between classic ML and DL?

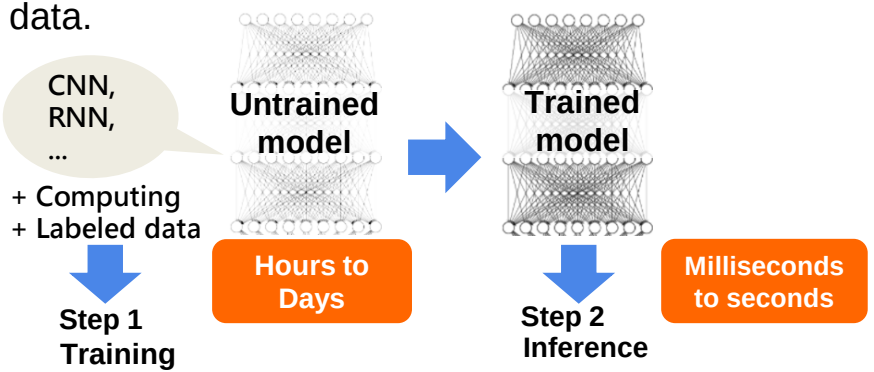
Machine Learning

Using optimized functions or algorithms to extract insights from data.



Deep Learning

Using massive labeled data sets to train deep (neural) graphs that can make inference about new data.



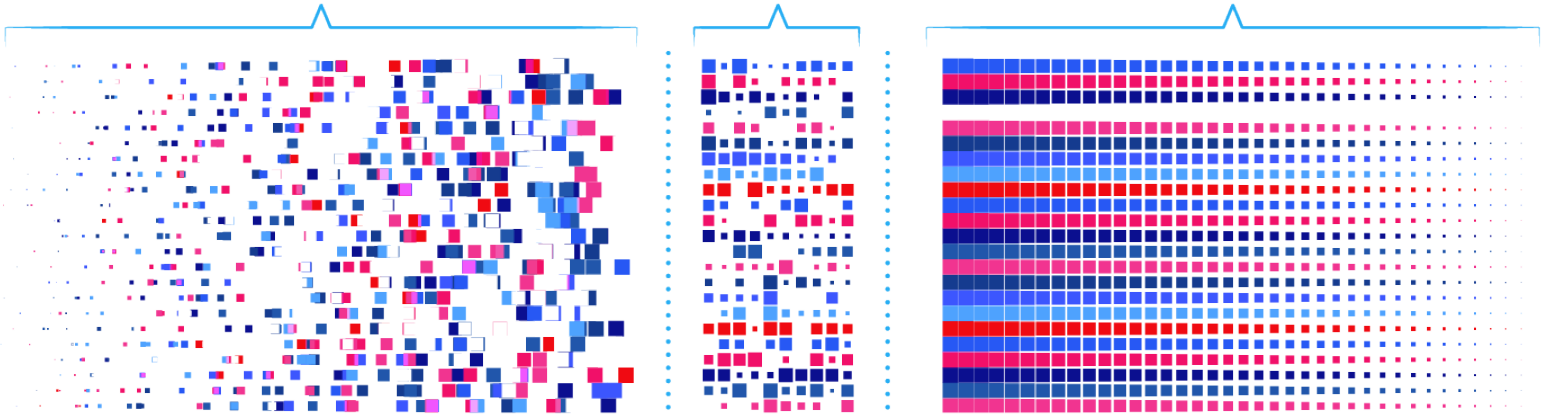
Sample DL application– Image Classification

Typical training run

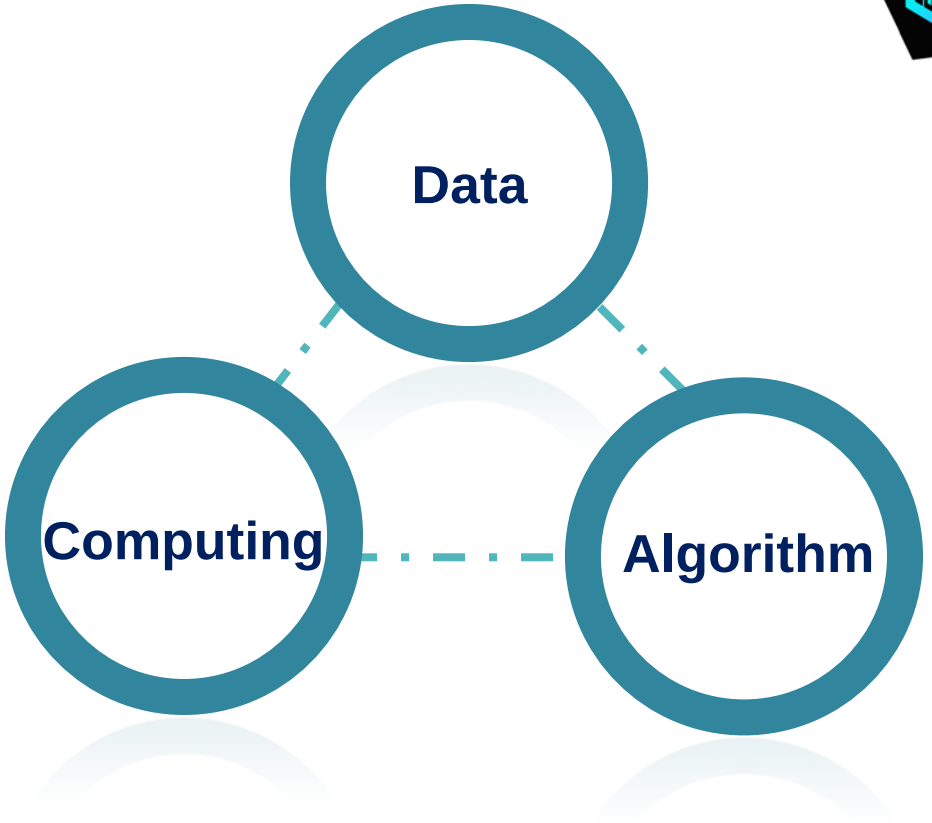
- Pick a DNN design.
- Input 100 million training images spanning 1,000 categories.

Test accuracy

If bad: modify DNN, fix training set or update training parameters.



Successful deep learning (training) depends on 3 key factors



Pain points for data scientists

1. Using laptops/desktops to develop their model, but storage and computing resources are limited. A workstation with GPU and storage is needed to train / validate their model.
2. Lack of knowledge to setup NVIDIA GPU drivers, containers, GPU passthrough, etc.
3. Lack of knowledge to setup data backup/sharing, network configurations, etc.

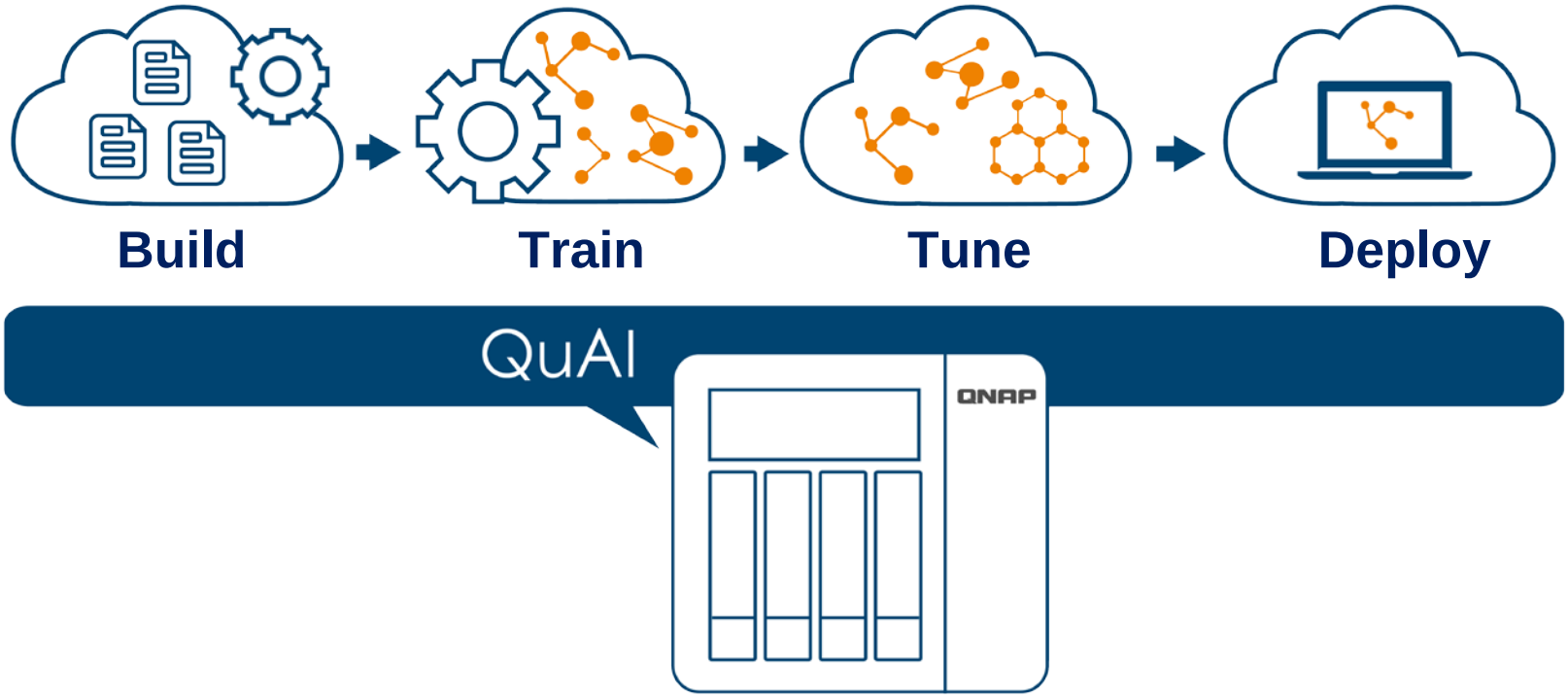
PAST



FUTURE



AI Development with QuAI



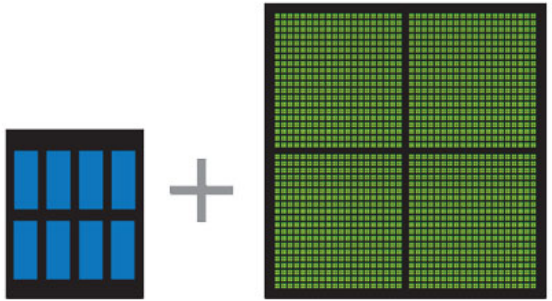
QTS 4.3.4 Adds Graphics Card Support



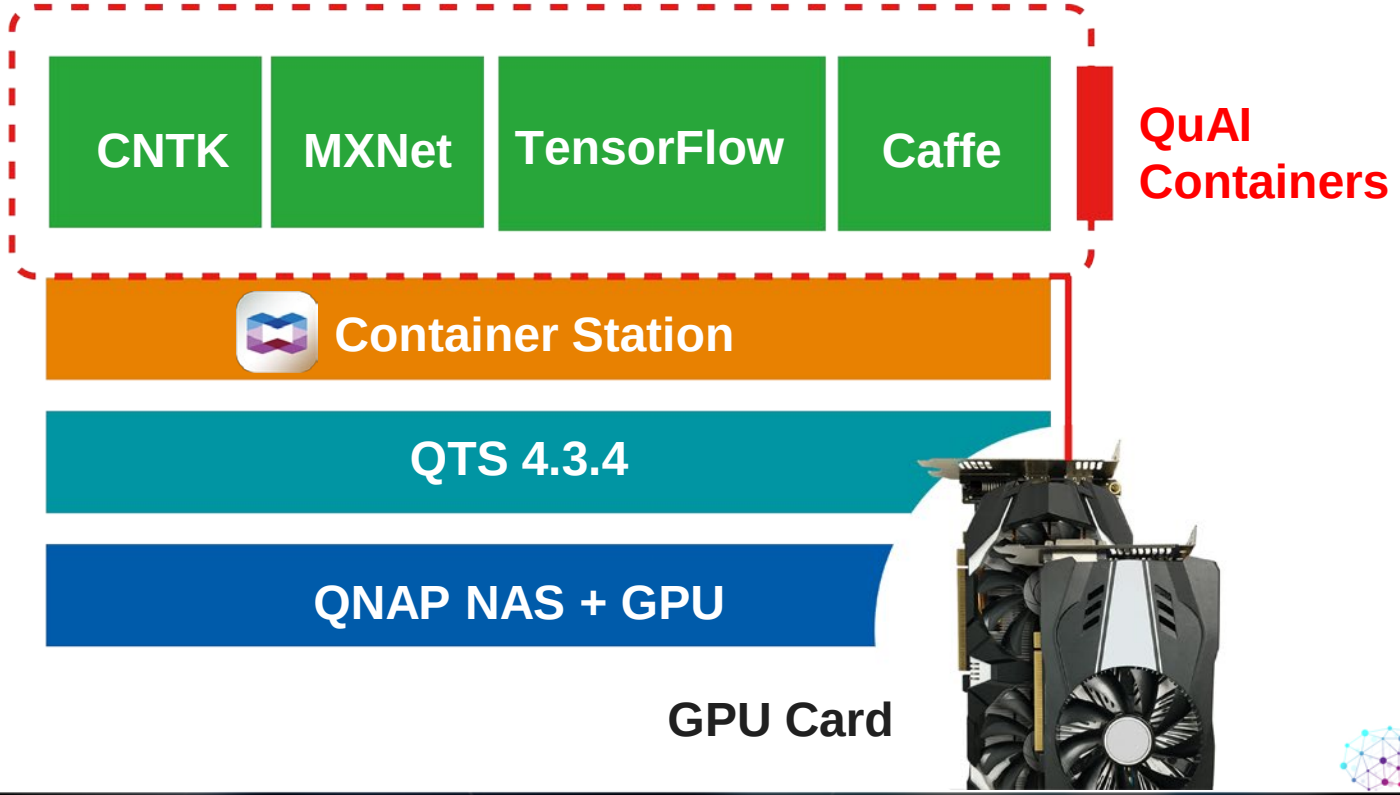
QuAI with GPU Accelerated Computing

- **Fuel QuAI development with GPU-accelerated computing.**
- **QNAP NAS integrates the capabilities of a PCIe graphics card into QTS and in-turn to Container Station.**
- **With the power of modern graphics cards in QNAP NAS, performance of AI modeling can be greatly boosted.**





QuAI Architecture



Supports multiple frameworks/libraries













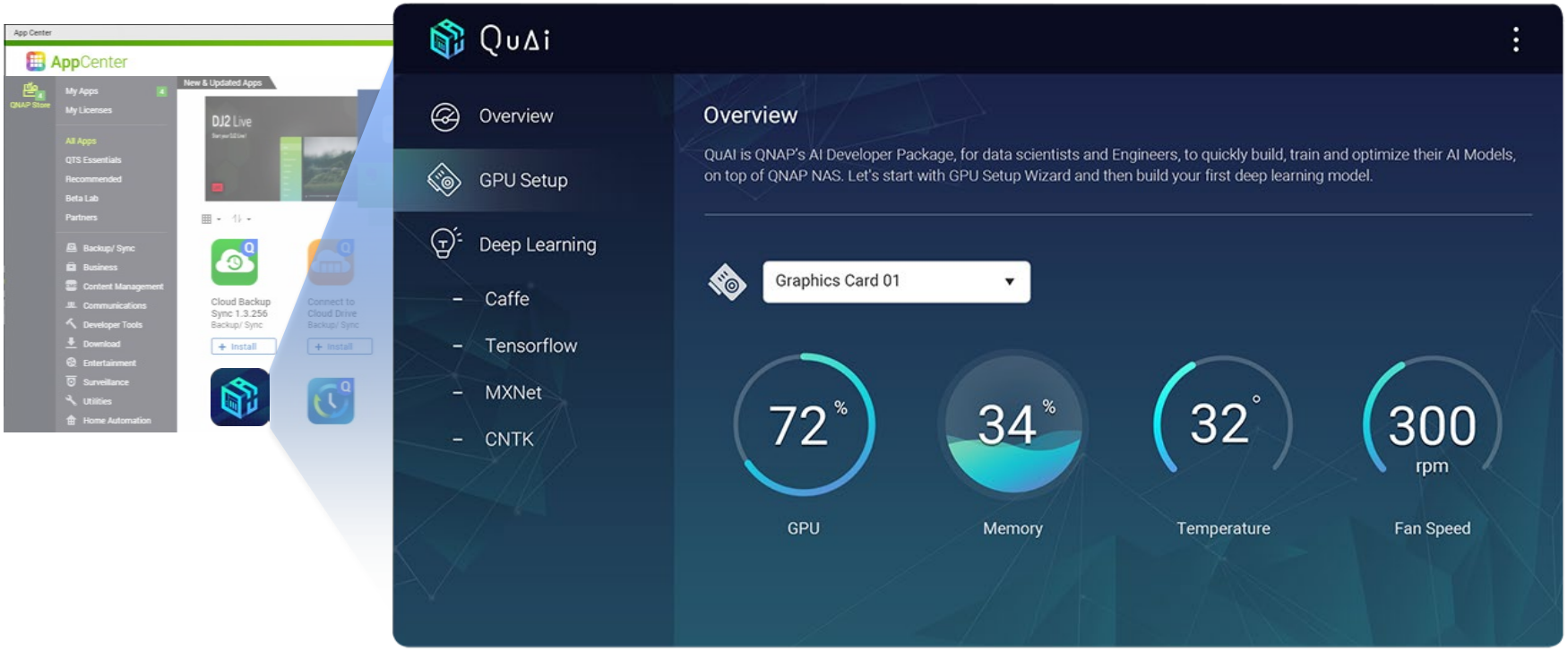
Get Started with QuAI

1. Install and run QuAI from App Center inside QTS.
2. Insert a compatible graphics card into the NAS.
3. Install drivers for the graphics card from App Center inside QTS.
4. Set the GPU allocation to QTS.
5. Create the required framework containers in Container Station and start your first AI application.

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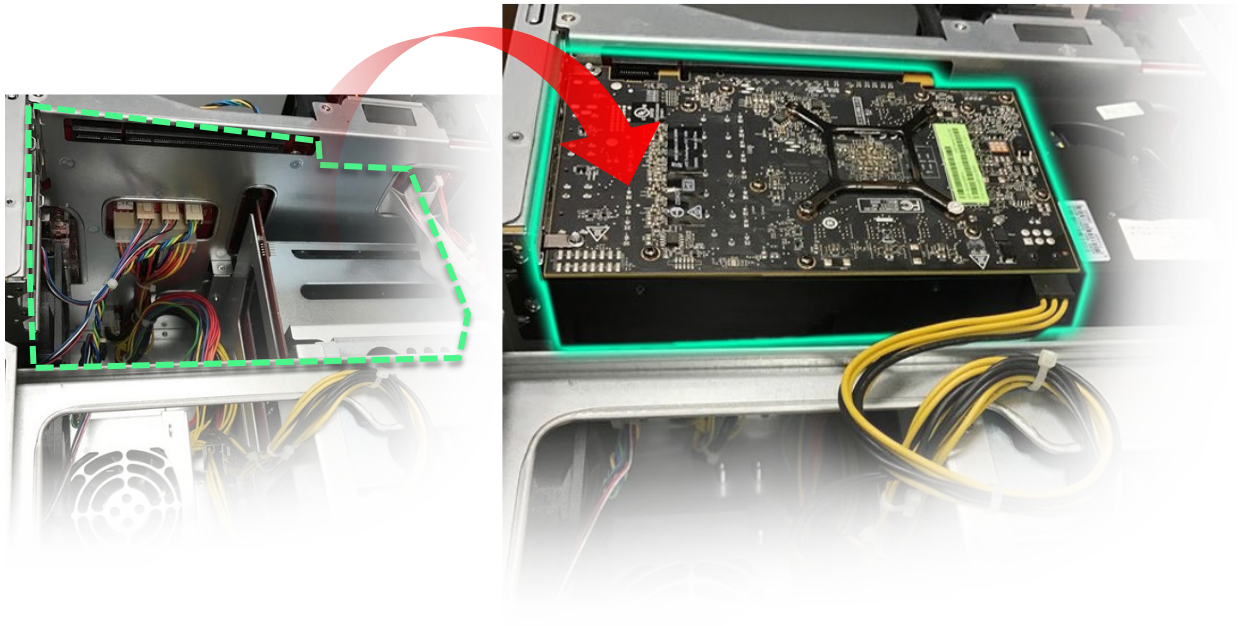
Install and run QuAI from App Center inside QTS



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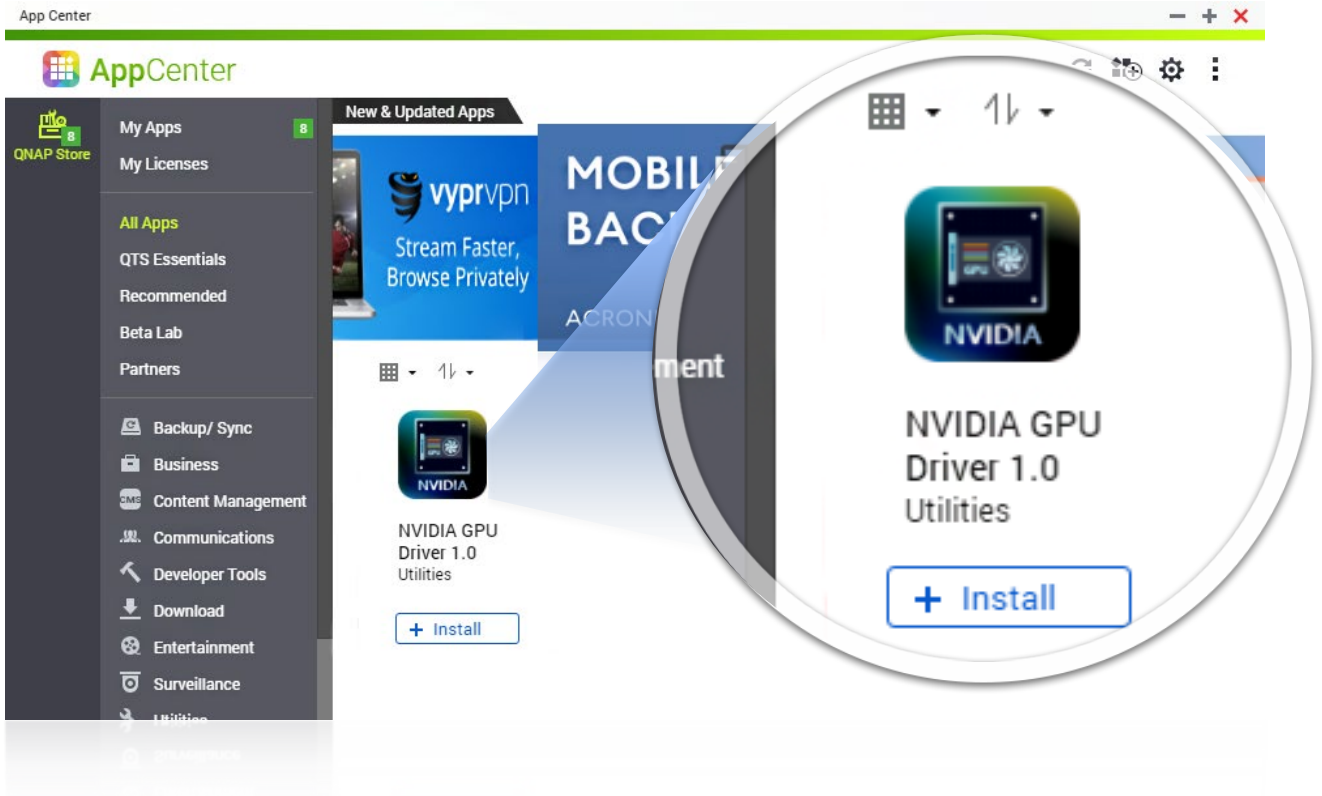
Insert a compatible* graphics card into NAS



Get Started with QuAI

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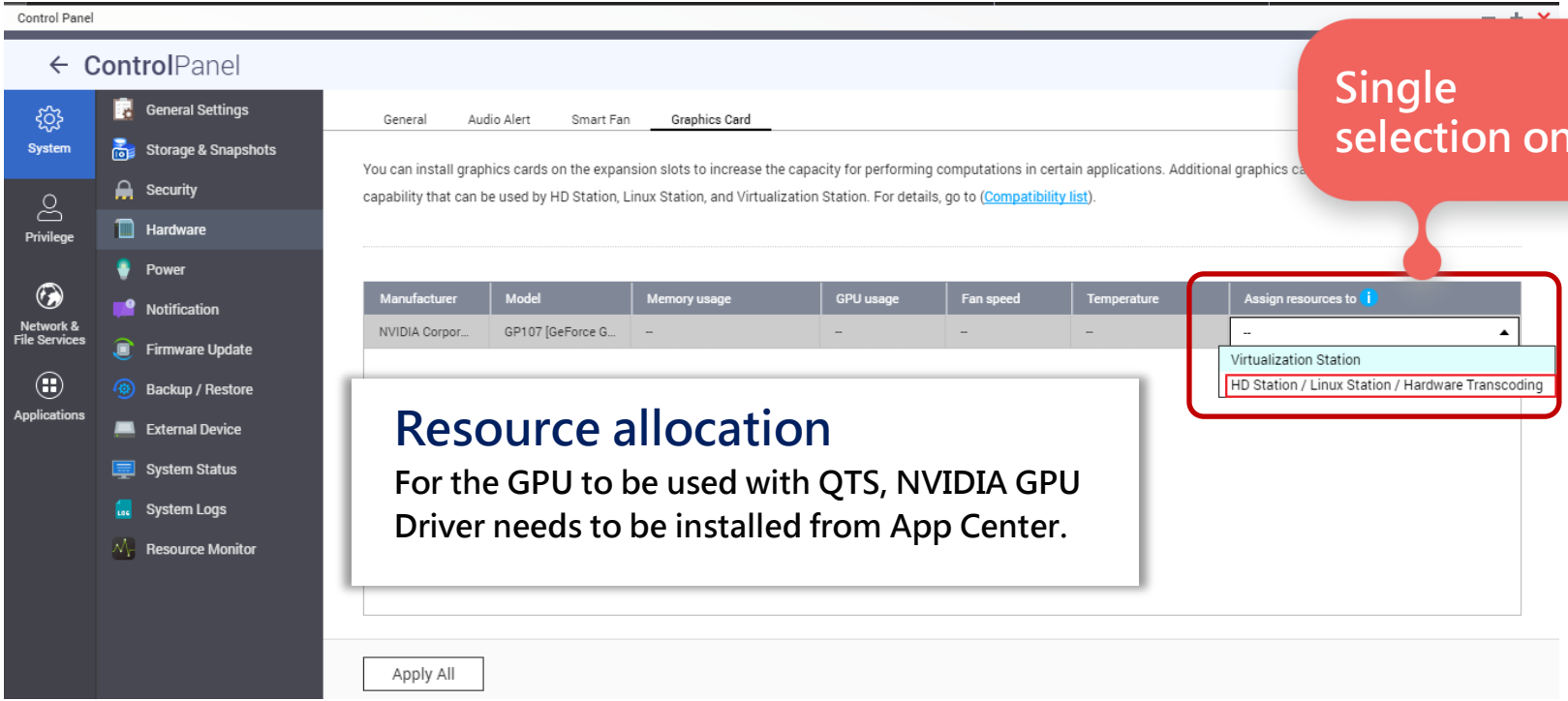
Install Graphics Card Drivers



Get Started with QuAI

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Set GPU Allocation to QTS



Single selection only!

Resource allocation

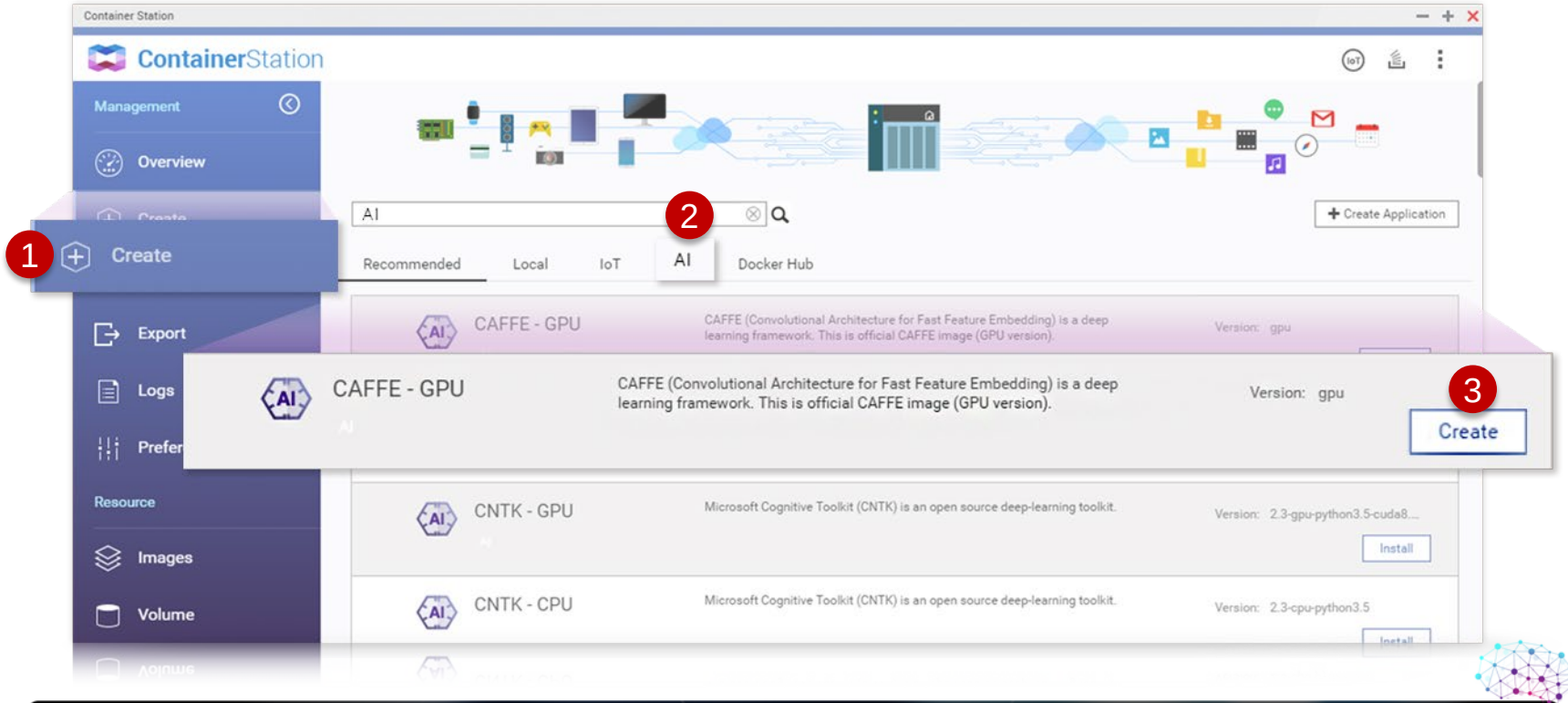
For the GPU to be used with QTS, NVIDIA GPU Driver needs to be installed from App Center.

NVIDIA GPU Driver 1.0
Utilities

Get Started with QuAI

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5. **Create the required framework containers in Container Station and start your first AI application.**

Create required framework containers in Container Station



Why QNAP NAS for AI?

- **Keys are building, training and optimizing your AI models.**
- **Typically high performance workstations or public clouds are used for this process.**
- **Generally these elements are complemented by GPUs.**

But are these the best solutions for AI development?

High Performance Workstations





Public Cloud Platforms

amazon web services™

Microsoft Azure

Why QNAP NAS for AI?



High Performance Workstations

- High TCO (total cost of ownership).
- Difficult to setup.
- Long time to configure AI frameworks.
- Not optimized to store and manage huge data.



Public Cloud

- Very complex pricing model.
- Difficult to transfer terabytes of data to public cloud to train AI models.
- Privacy might be an issue.

Why QNAP NAS for AI?

Low investments and high gains

- Relatively lower total cost of ownership, compared to workstations.
- One time cost against complex billing model of public cloud platforms.
- Higher cost efficiency with QNAP NAS.



It's FAST, it's EASY and It's QuAI

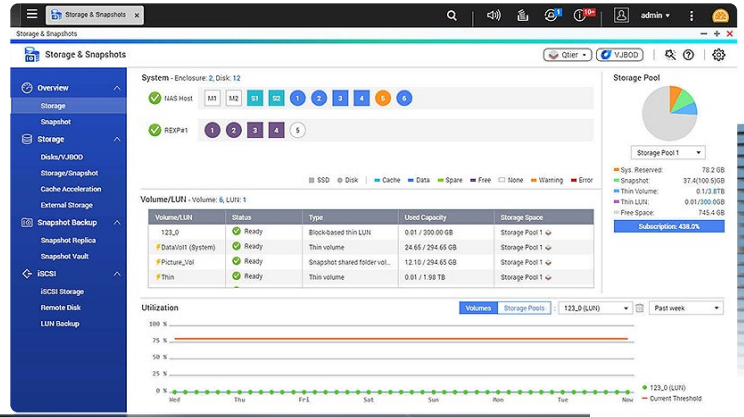
- QuAI helps setup AI environment in few quick and easy steps.
- Provides an advanced wizard for quick GPU configurations.
- It takes just few minutes, against few hours on workstations.



Why QNAP NAS for AI ?

Designed to manage huge data

- **Unique and most sophisticated storage management capabilities with new Storage and Snapshots Manager.**
- **Provides almost unlimited storage.**
- **Qtier identifies hot and cold data through self-learning based on data access frequencies.**

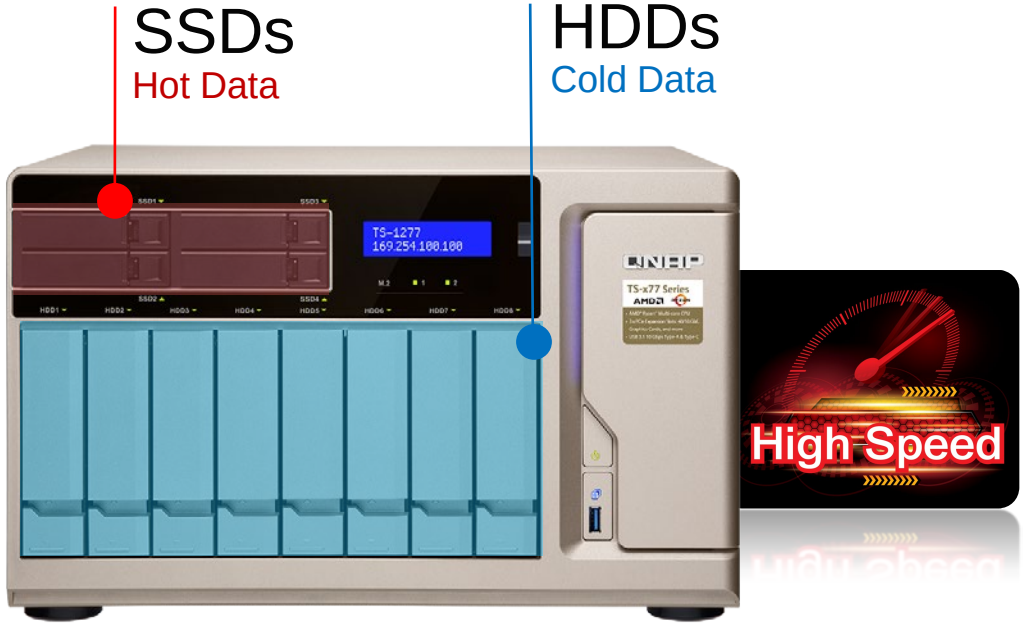




Why QNAP NAS for AI ?

High IOPS

Accelerate IOPS performance for your IOPS-intensive AI applications with QNAP's SSD cache technology.



Why QNAP NAS for AI?

Multiple layers of data protection

Built on the security first principal to minimize the risk of data breaches with multiple data protection mechanisms, and user privilege controls.



Why QNAP NAS for AI?

QTS 4.3.4

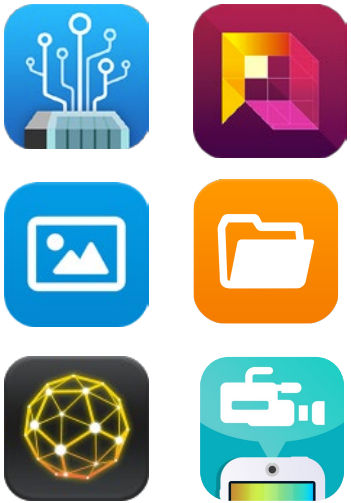
QNAP NAS with QTS, the most stable, robust, comprehensive and Intelligent operating system, is a strong foundation for your AI applications and training frameworks.



Why QNAP NAS for AI?

Availability of Huge Training Data:

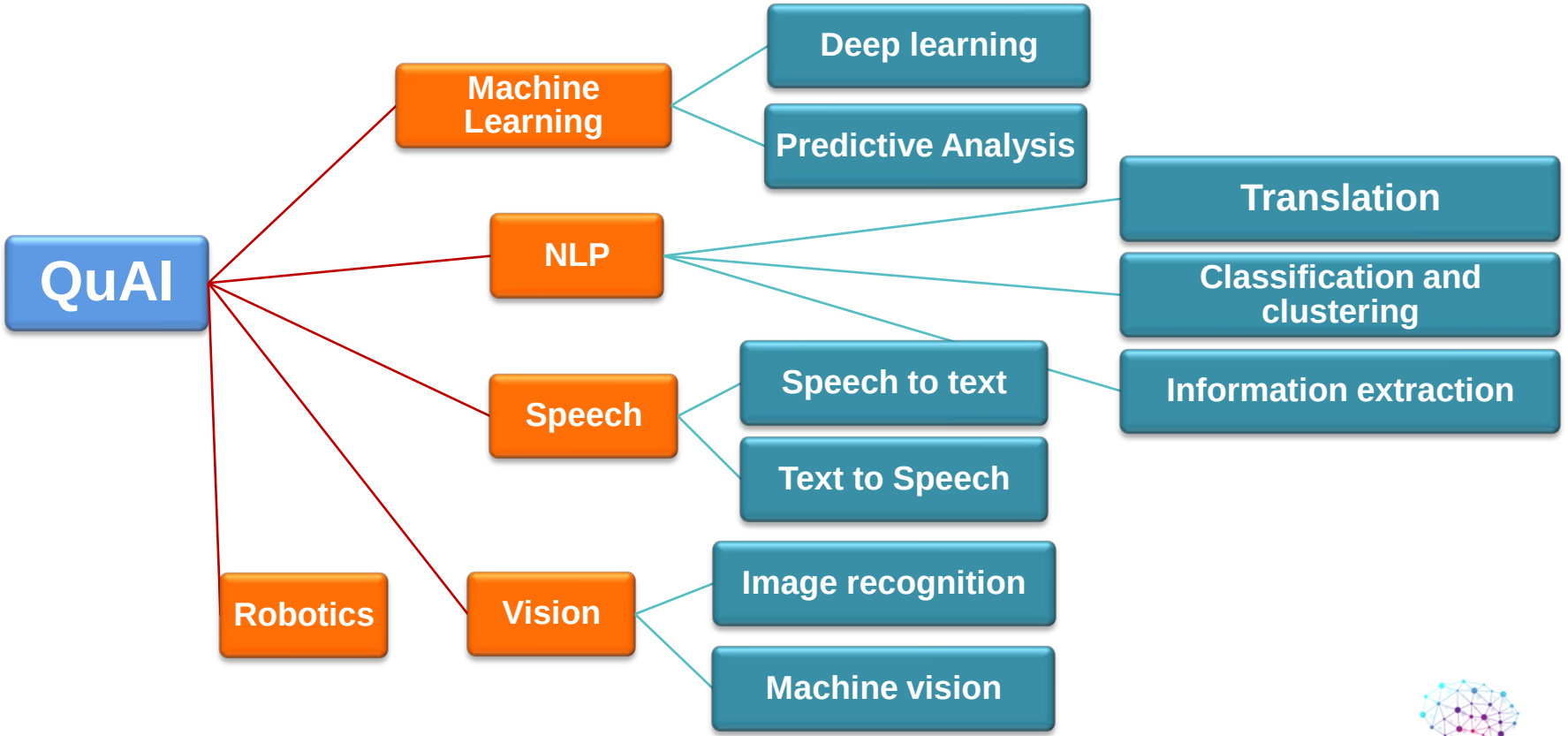
Leverage huge and diverse data which is readily available from huge range of QNAP NAS applications to train your AI Models.







Applications of QuAI



Supported Models and System Requirements

NAS Models
TS-x77

System Requirements:
QTS 4.3.4 and above; Container Station v1.8 and above

Supported Graphics Cards: (TBD)

Brand	Model
ASUS	DUAL-GTX1050-O2G-GAMING
ASUS	GPH-GTX1050-2G
ASUS	PH-GTX1050TI-4G
ASUS	PH-GTX1060-3G
EVGA	GTX1050 2G SC
EVGA	GTX1050TI 4G SC GAMING
EVGA	GTX1060 6G SC GAMING
GIGABYTE	GV-N1050TD5-4GD
GIGABYTE	GV-N1070IXOC-8GD

Brand	Model
MSI	GTX1050 TI 4GT LP
MSI	GTX1060 6GT OCV1
MSI	GTX1060 AERO ITX 3G OC
NVIDIA	Quadro M2000
NVIDIA	Quadro P2000 5G
NVIDIA	Quadro P4000



- Getting Started with QuAI
- Image Classification using Caffe
- Training a handwritten digits predication model using Tensorflow
- Image Classification using Caffe


QNAP
Container Station
QNAP & AI
Artificial Intelligence
Reasoning
Thank You