Deep Learning

The Driving Engine for The Internet of Things

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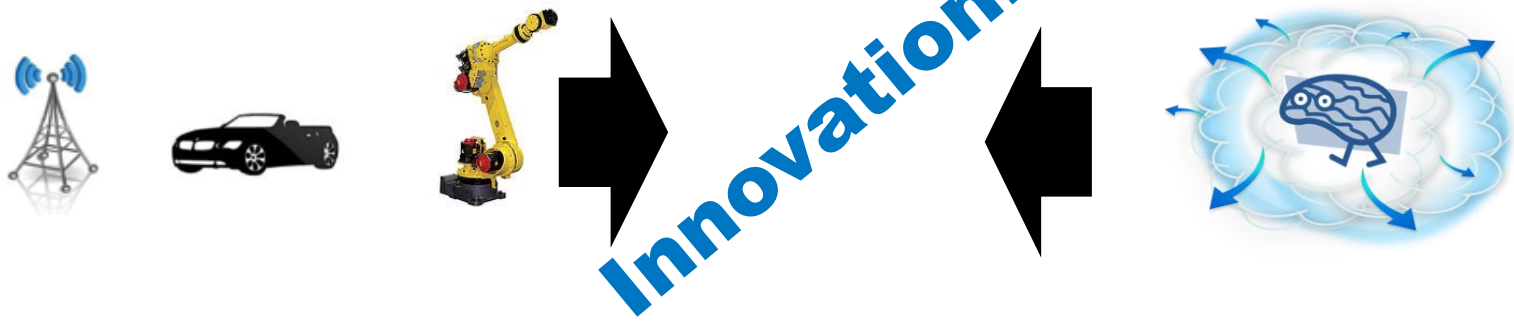
President & CEO

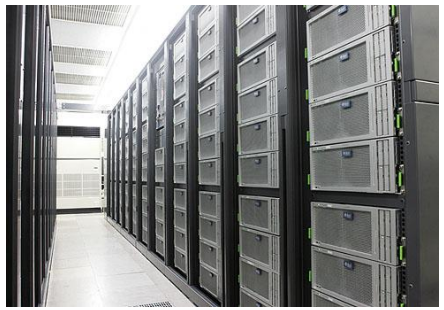
Preferred Networks, Inc.

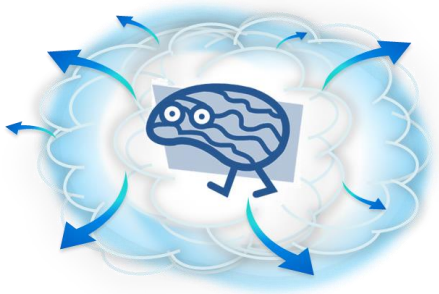


Internet of Things **Deep Learning**

Our Strategic Partners

Chainer





Deep Learning

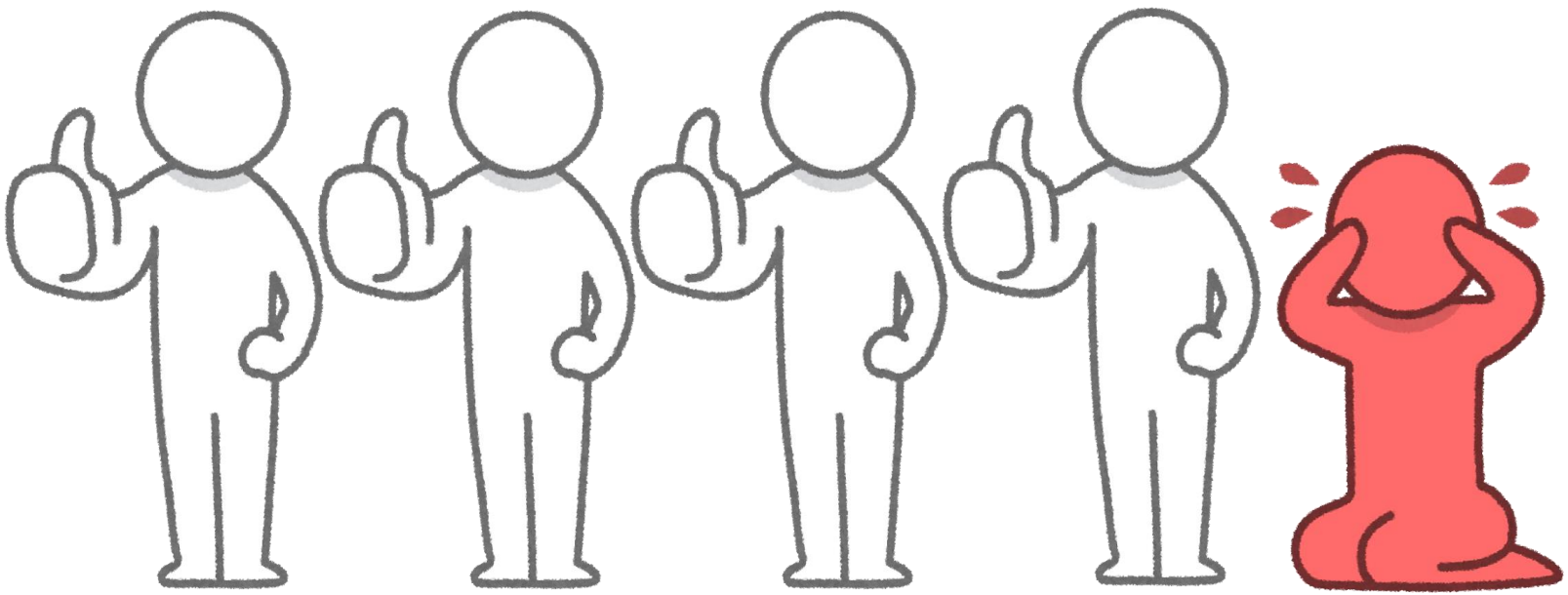
Internet of Things

The National Cancer Center in Japan and Preferred Networks start collaborative research in deep learning

Accuracy for Breast Cancer Diagnosis

Mammography	80%

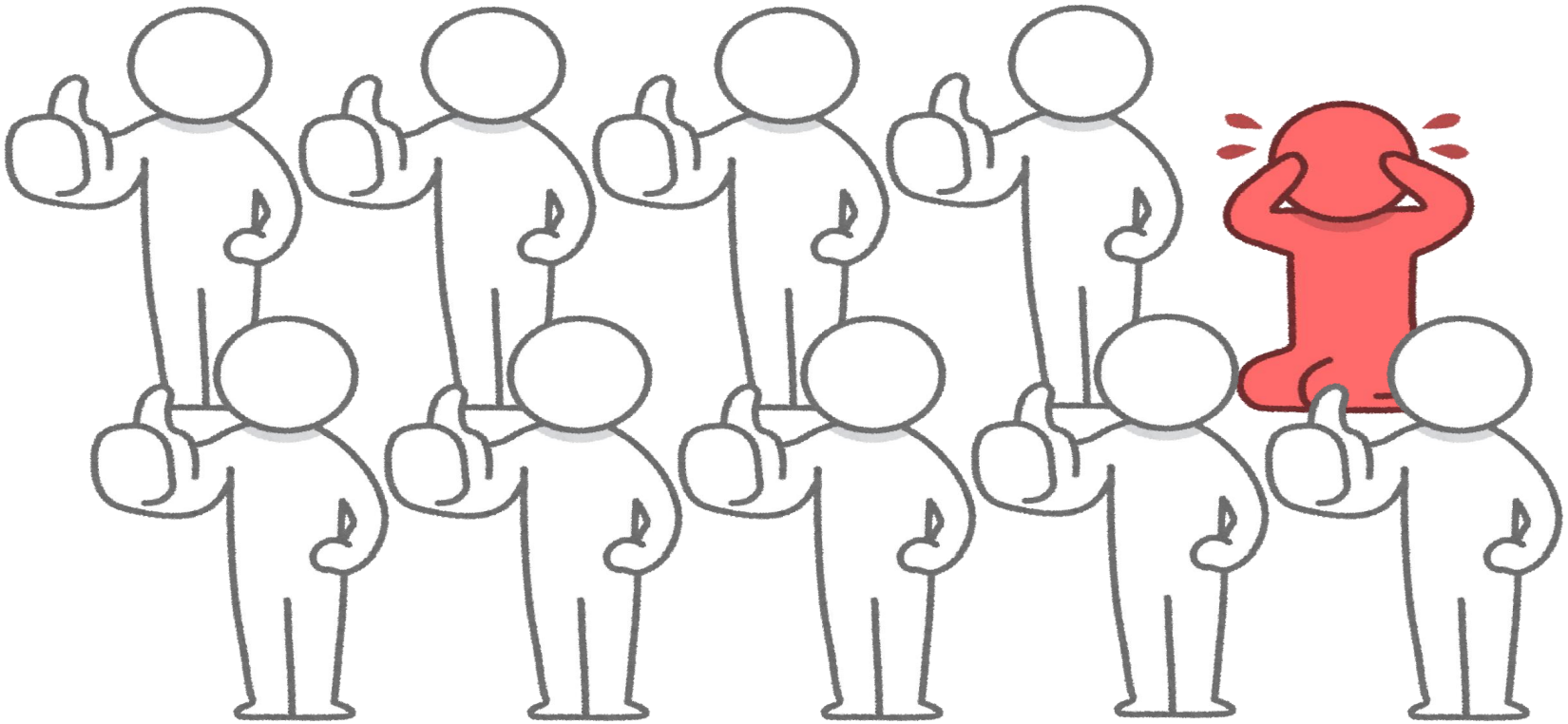
1 in 5 women



Accuracy for Breast Cancer Diagnosis

Mammography	80%
SOTA Liquid Biopsy	90%

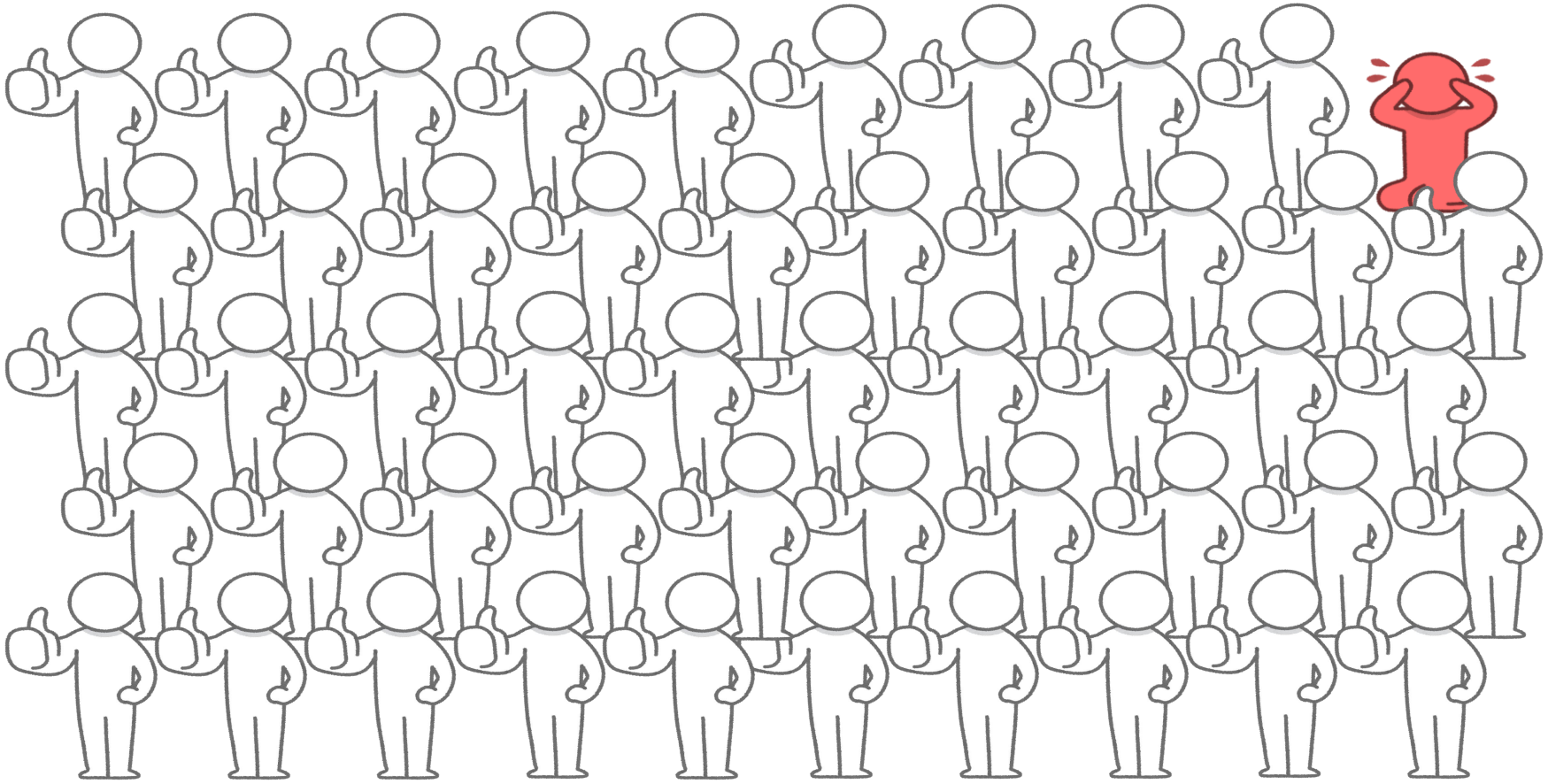
1 in 10 women



Accuracy for Breast Cancer Diagnosis

Mammography	80%
SOTA Liquid Biopsy	90%
SOTA Liquid Biopsy with Deep Learning	99%

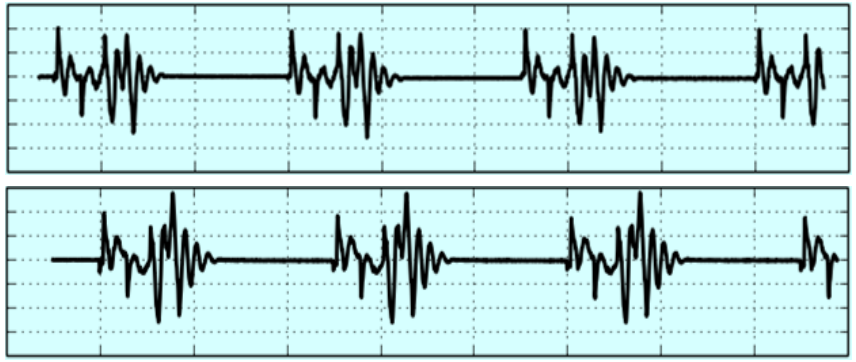
Less than 1 in 100 women



PaintsChainer (#PaintsChainer)

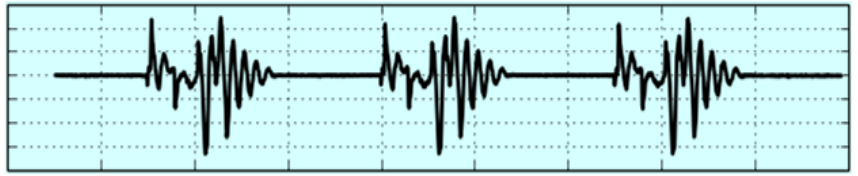
http://free-illustrations.gatag.net/2014/01/10/220000.html

Anomaly prediction for FANUC robots



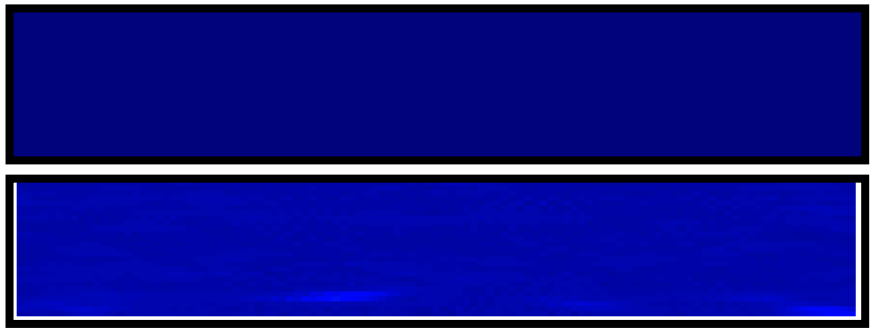
Normal

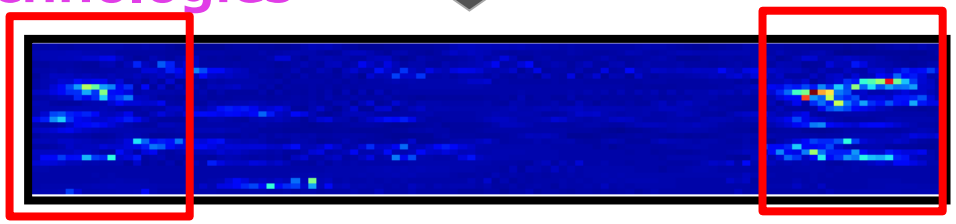
Sensor data obtained from fanuc robot's reducers



Anomaly

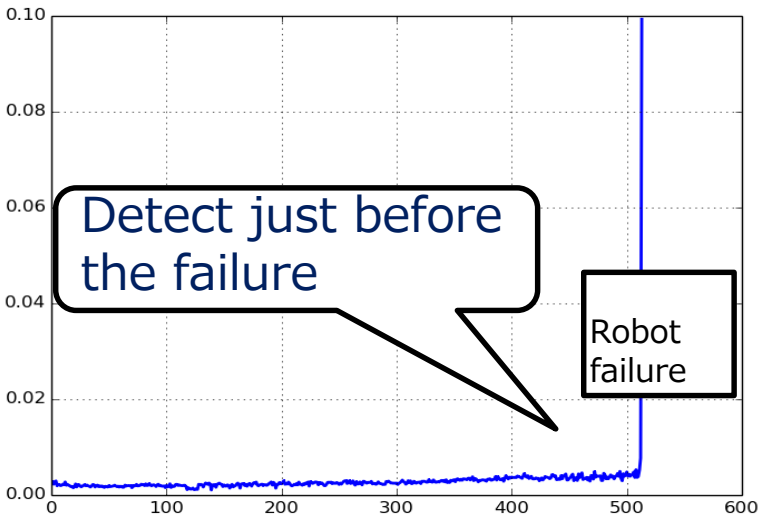
Extract anomaly signals using deep learning technologies





Detect anomaly signals

Existing methods

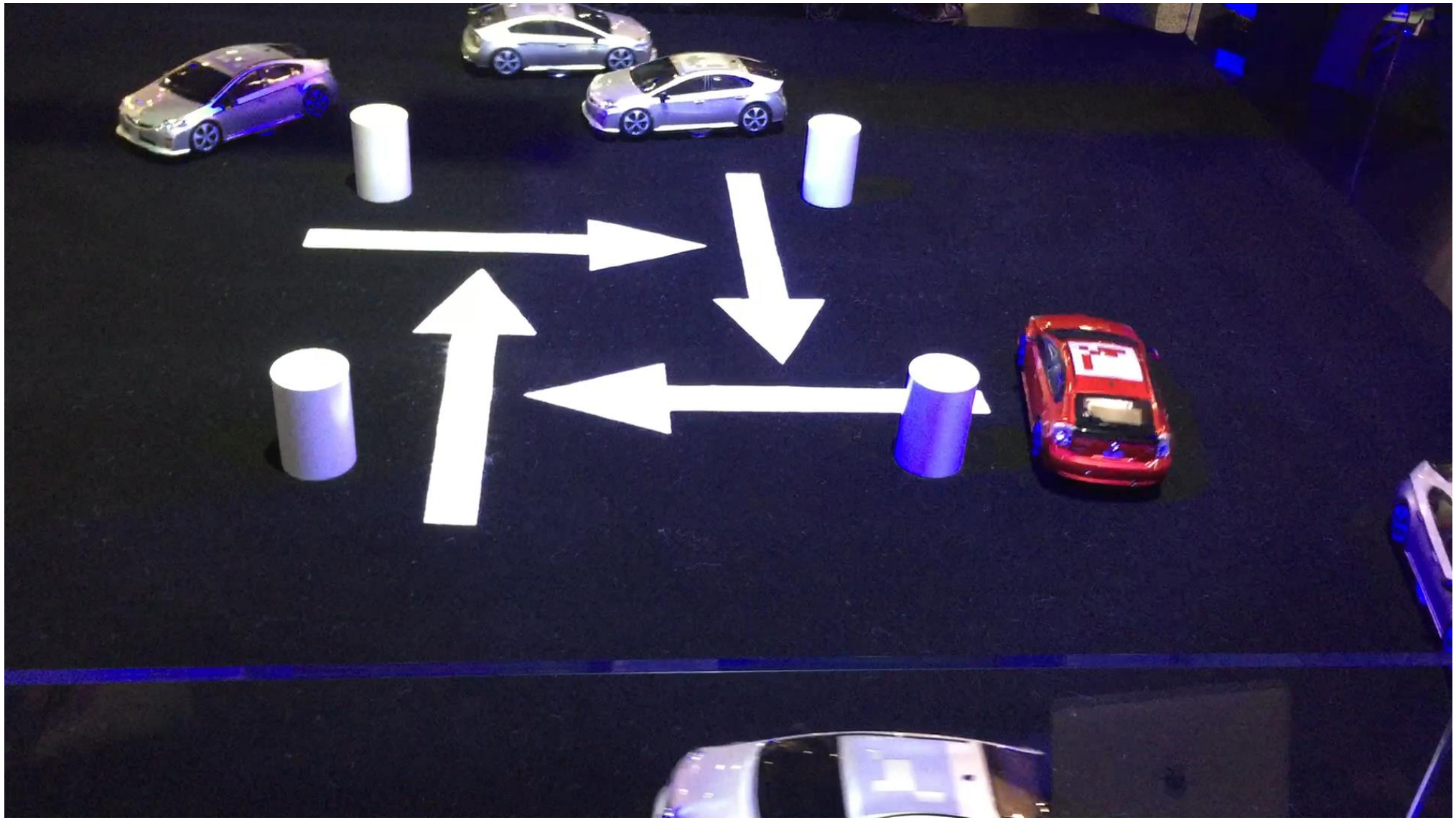


Elapsed time

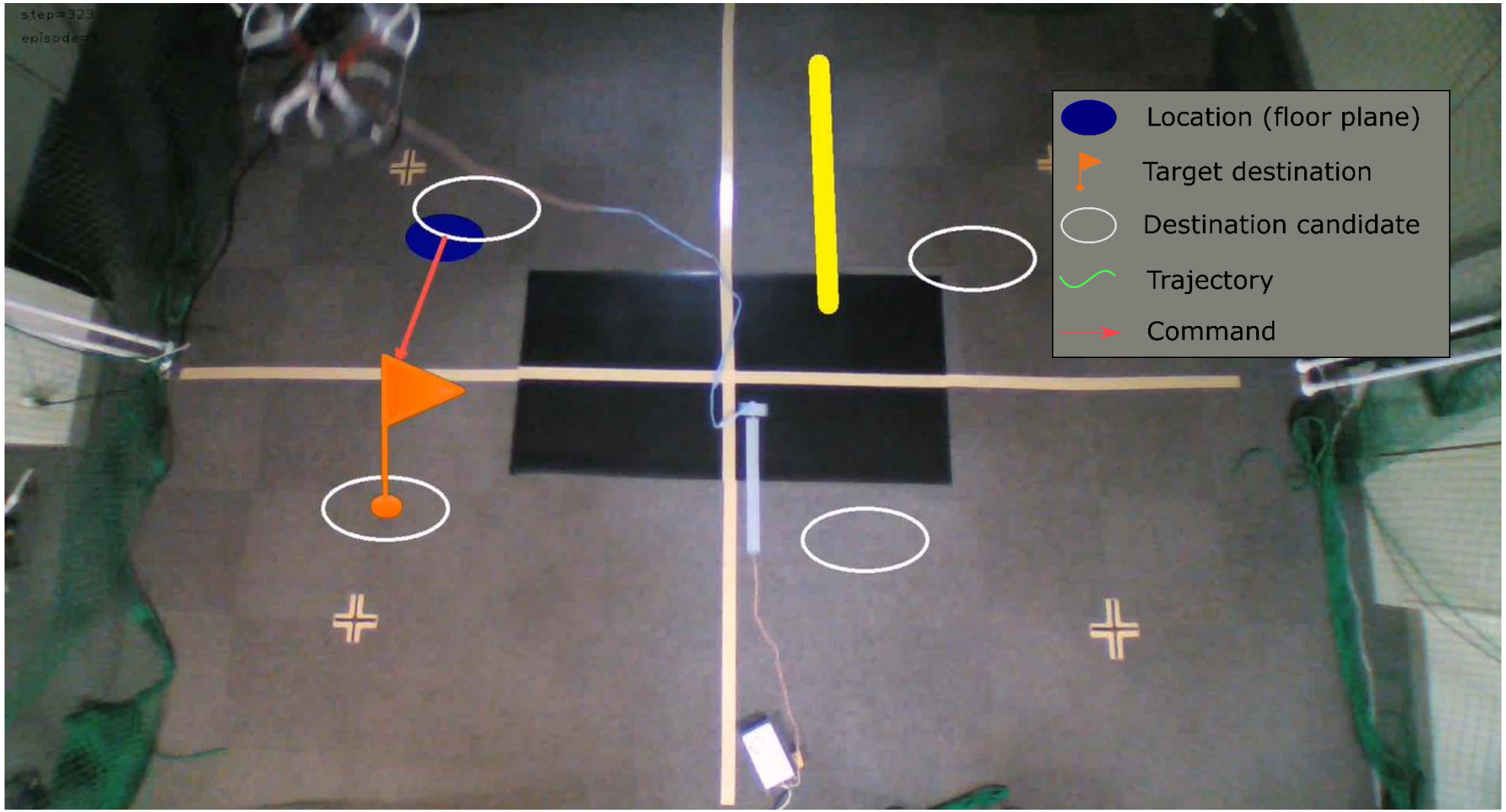
Deep learning based methods

Can predict the failure much earlier than the existing methods

Deep reinforcement learning makes autonomous driving more robust



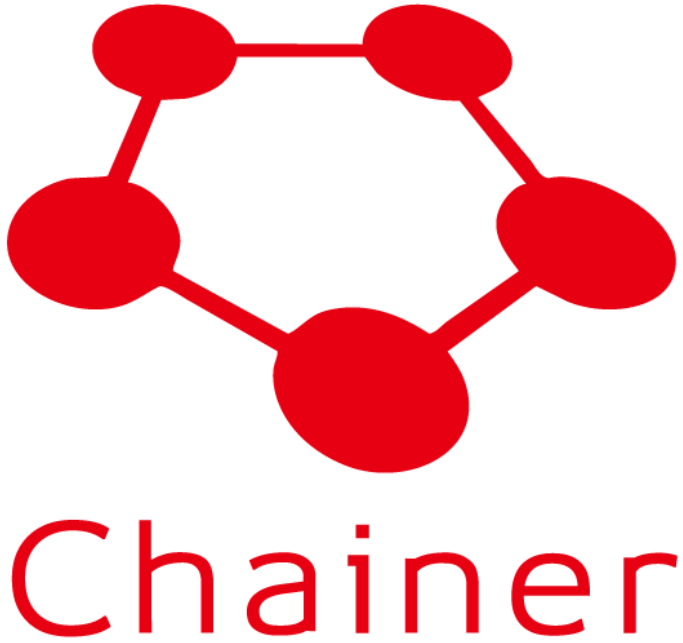
Deep reinforcement learning is also effective in controlling unstable mobile devices, such as drones



Amazon Pick Test Results

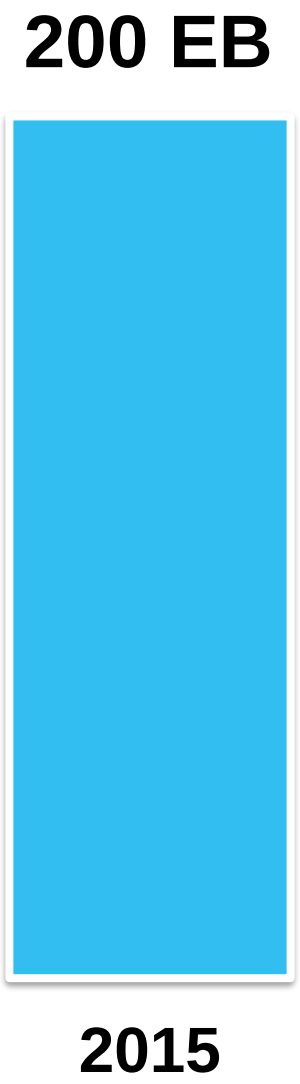
Place	Team	Score
1	Delft	105
2	PFN (Preferred Networks)	105
3	NimbRo Picking	97
4	MIT	67
5	Team K	49
6	ACRV	42
7	CMU-HARP	33
8	C^2M	21

We are accelerating deep learning application research and development by providing open source software

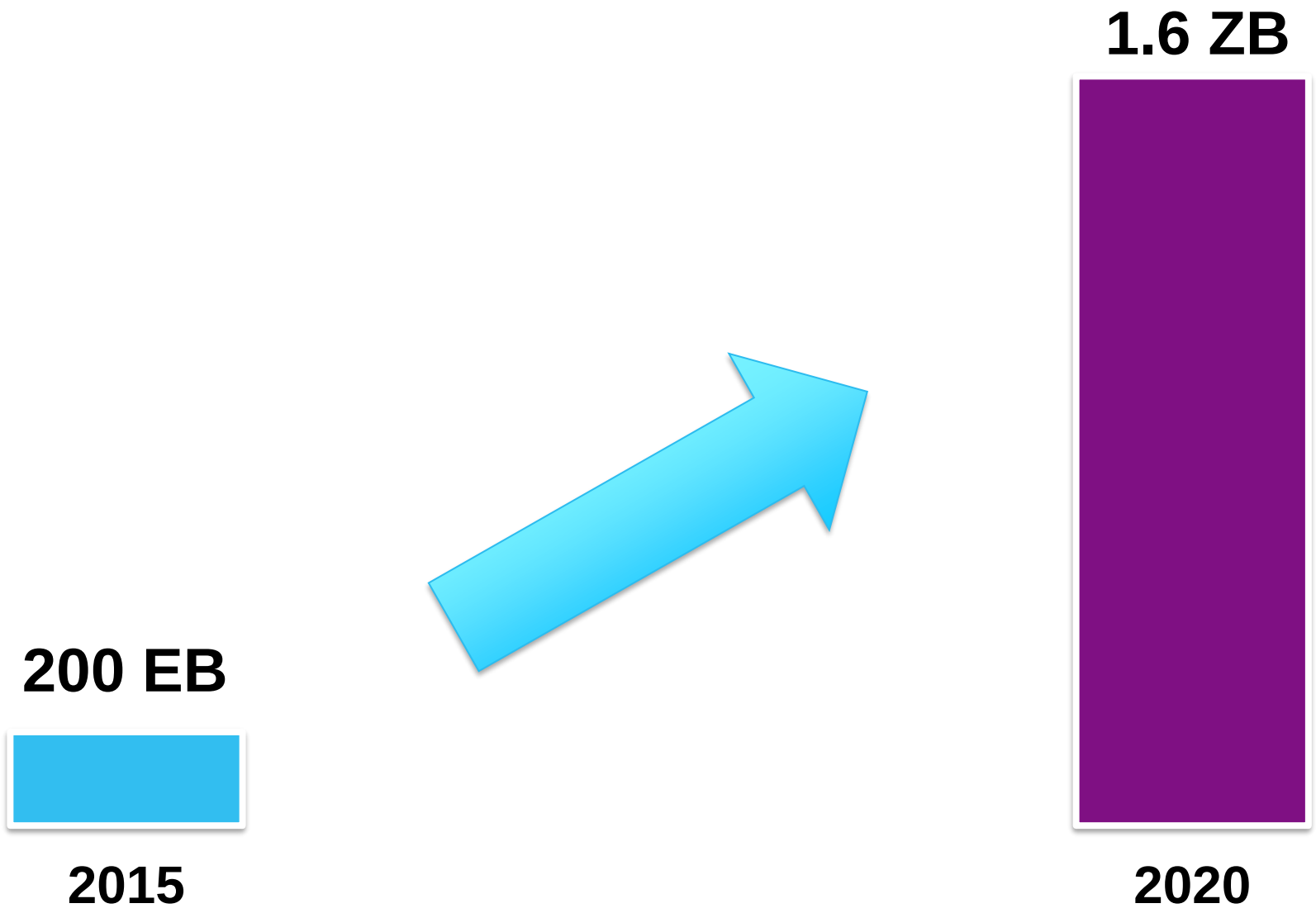


Released in 2015

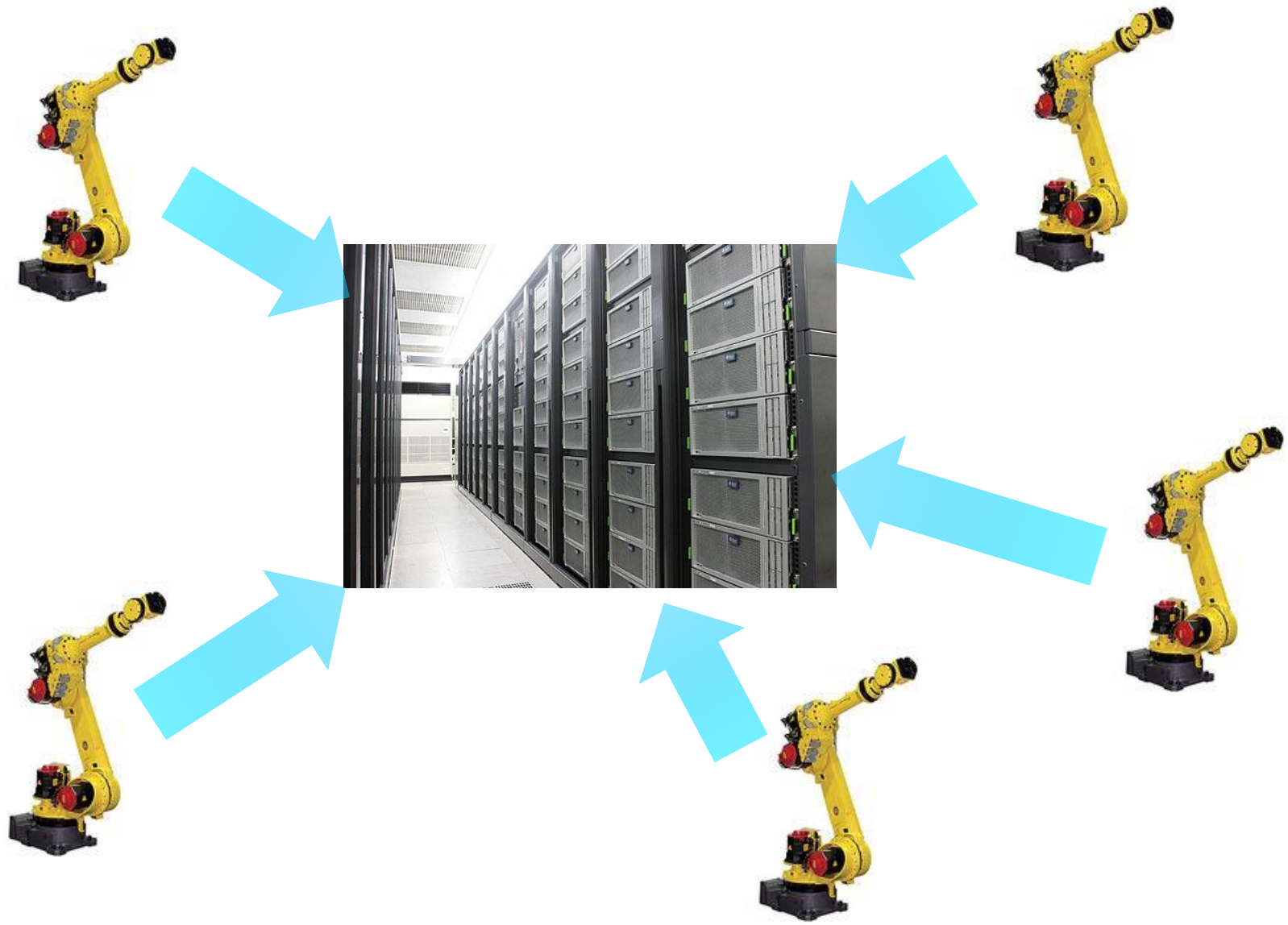
The volume of data generated from IoT devices is huge…



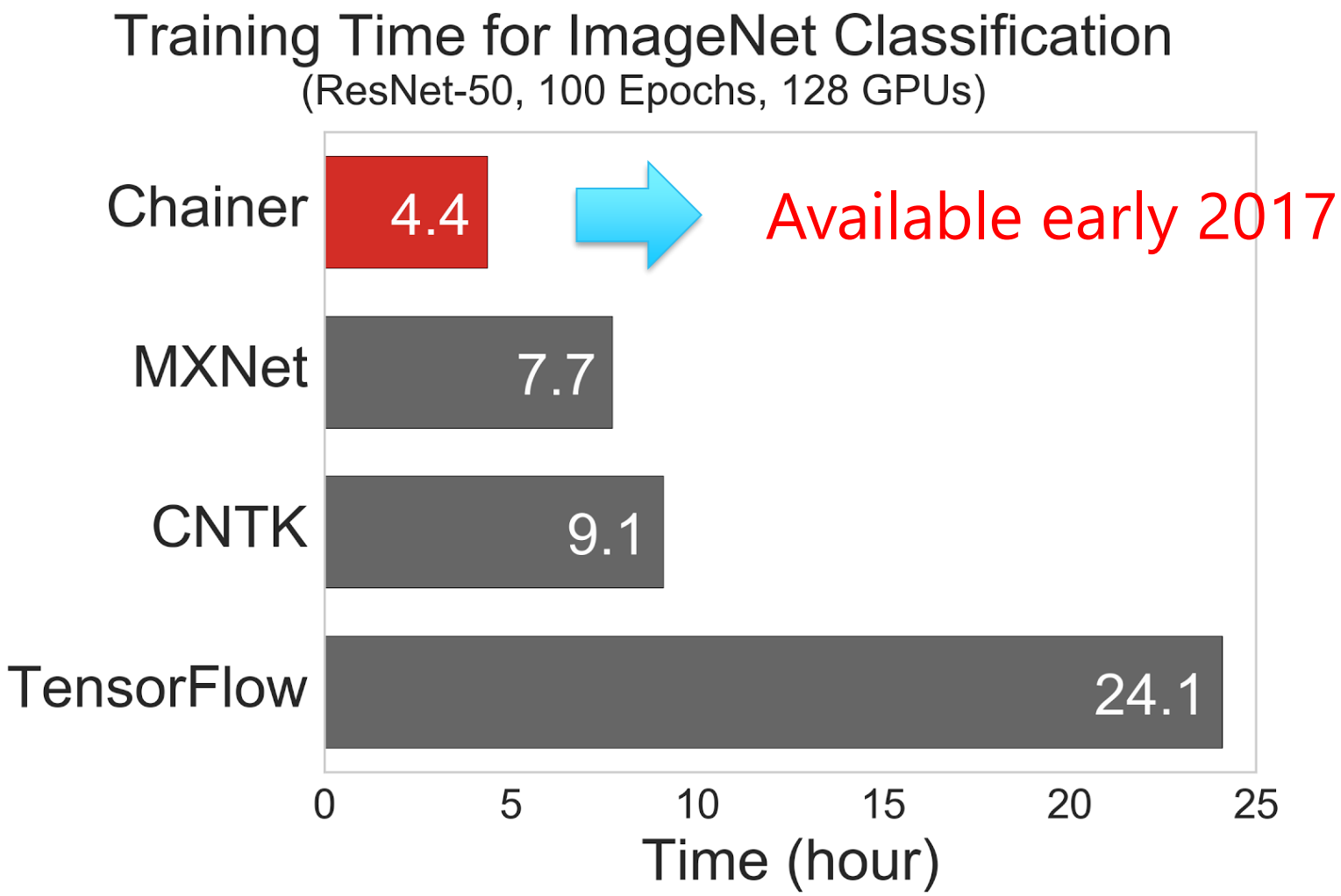
…and increasing rapidly



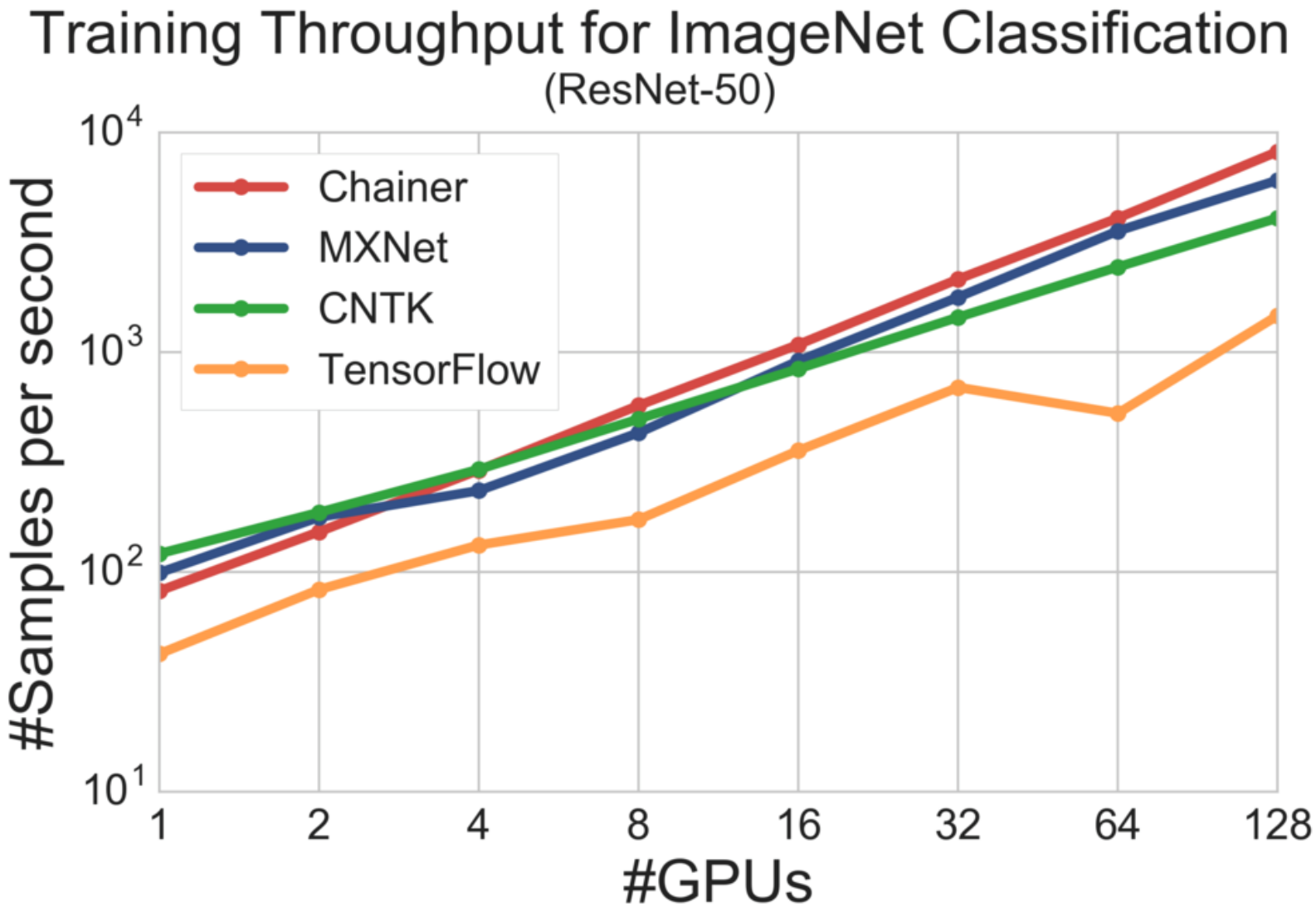
To process this huge amount of data, we need to apply parallel computing to deep learning



Performance Comparison in Scalability of Deep Learning Frameworks

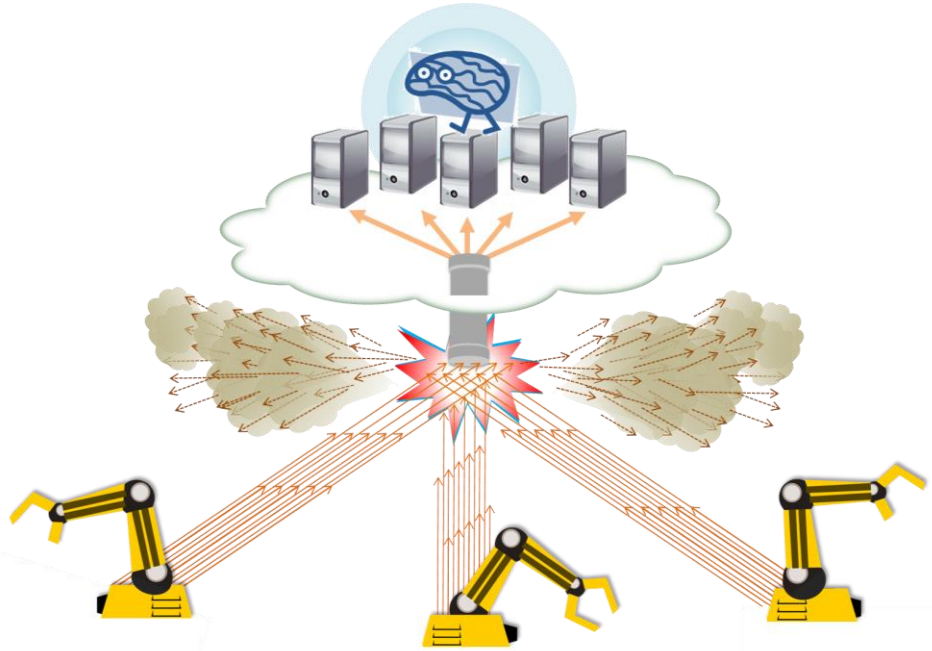


Scaling Result for CNTK, MXNet, TensorFlow and Chainer

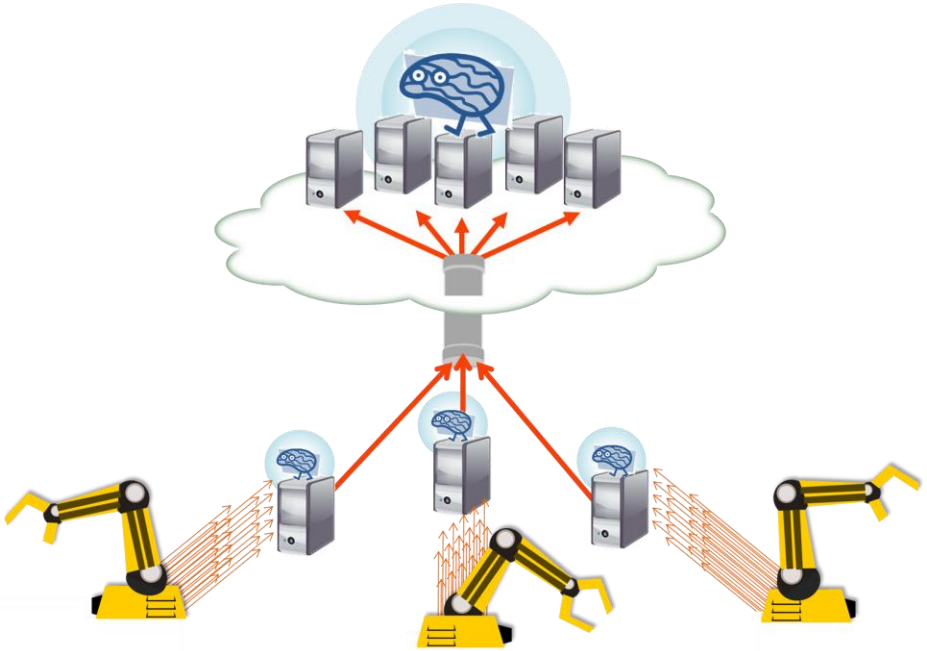


Decentralized computing architecture is one possible solution to eliminate the network bottleneck

Cloud Computing

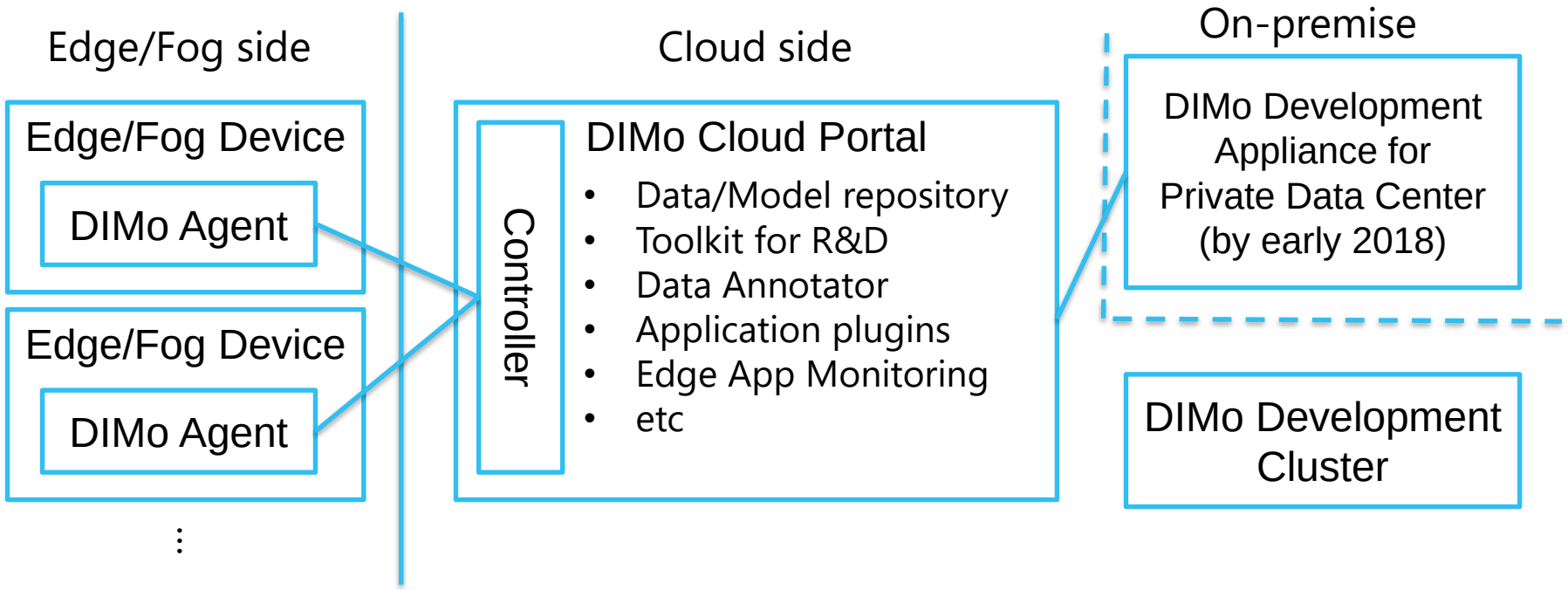


Edge Heavy Computing



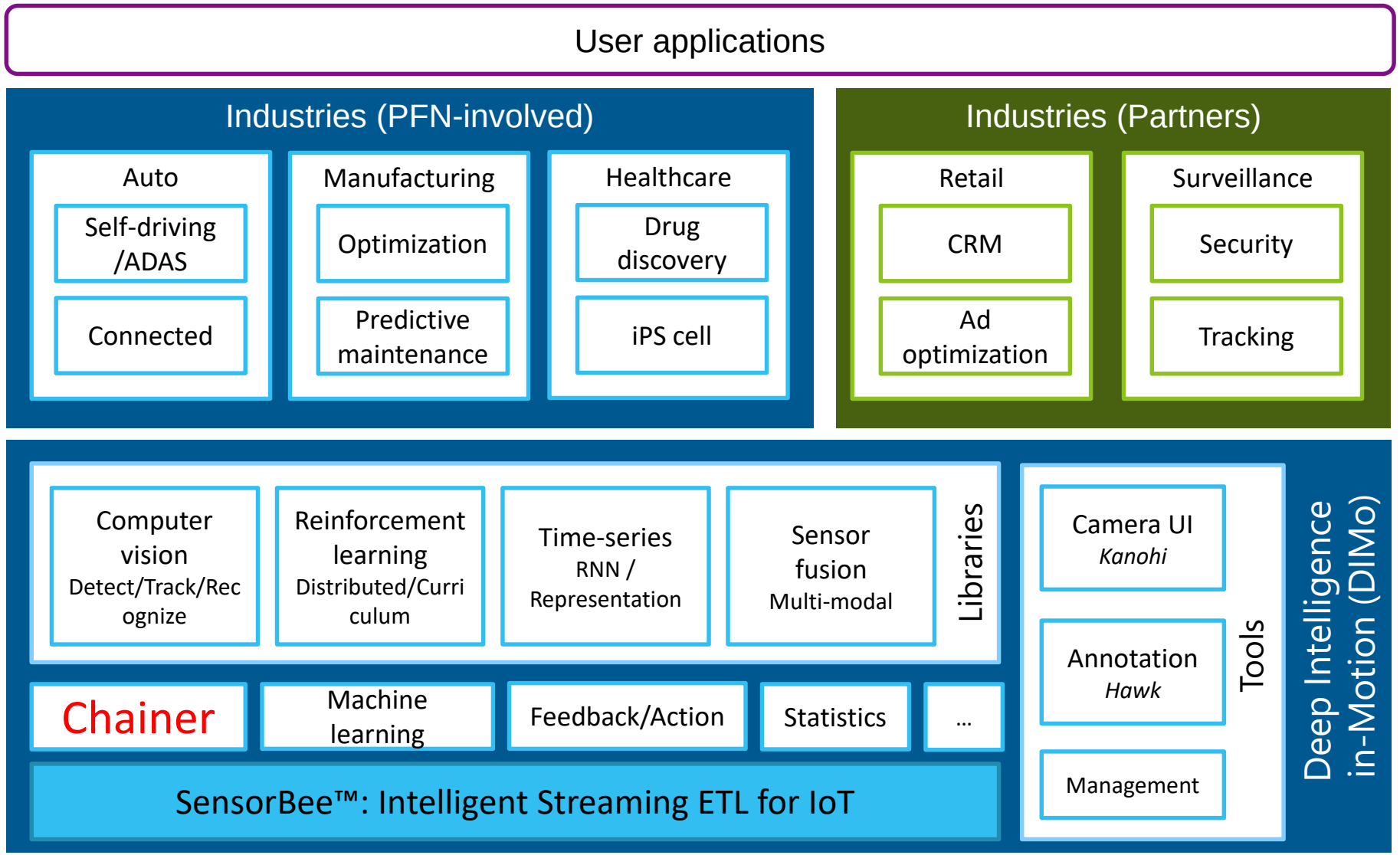
Summary of DIMo (Deep Intelligence in-Motion)

- DIMo is a platform for Deep Learning R&D and product development



- DL application deployment and management for edge and fog
- Training data management
- Packages for applications
  - Computer vision
  - Anomaly detection
- Development Env for on-premise and Cloud
- On-premise version can privately utilize most toolkit provided on the Cloud.

DIMo Software Stack for Application Development



We will launch the world's first edge-heavy deep learning platform for manufacturing

FA & ROBOT & ROBOMACHINE
FANUC

CISCO

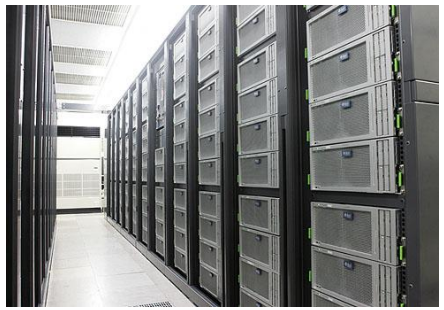
Rockwell Automation

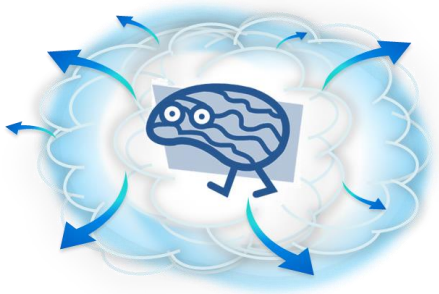
Preferred Networks

- ✓ Deep learning for industrial IoT
- ✓ Edge heavy computing
- ✓ Orchestrating various types of devices in real time

Conclusion

Chainer





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Internet of Things

Preferred Networks

WE ARE HIRING!

info@preferred.jp

Preferred Networks