

2019

Q-DAY

CONFERENCE

The **NEW SPRING** *of*
ARTIFICIAL INTELLIGENCE
and **MODELS**



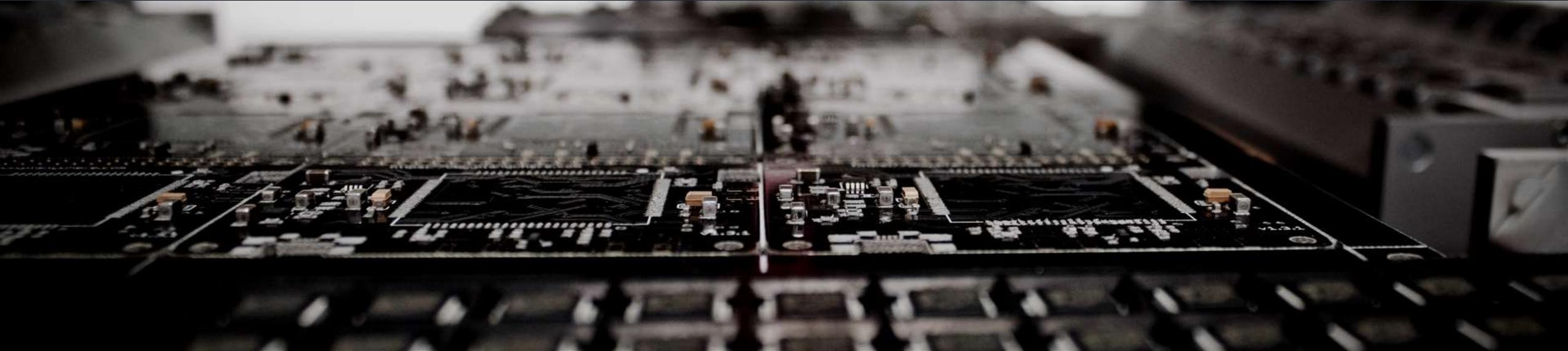
Jorge Fontes

Quidgest

Ai on the edge

- Challenges, Constraints and Practical Examples -

About us



mome.lab

Computer Vision and Machine Learning Research

What is Edge Ai

Edge Ai is the ability to process **Machine Learning** inference locally on a hardware device using data from its own sensors. Jorge Fontes

Machine learning is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. Wikipedia

Why move to the edge

Connectivity and Bandwidth

In real life scenarios connectivity is not perfect and bandwidth isn't unlimited

Cost

Sometimes it's the most cost effective solution.

Responsiveness

In many applications the user can't wait for the datacenter roundtrip

Privacy

As privacy is more regulated sending unrestricted amounts of data to the datacenter becomes unfeasible.



Challenges

Limited Computing Power

On the edge, computing power and storage is limited.

Size and Power Constraints

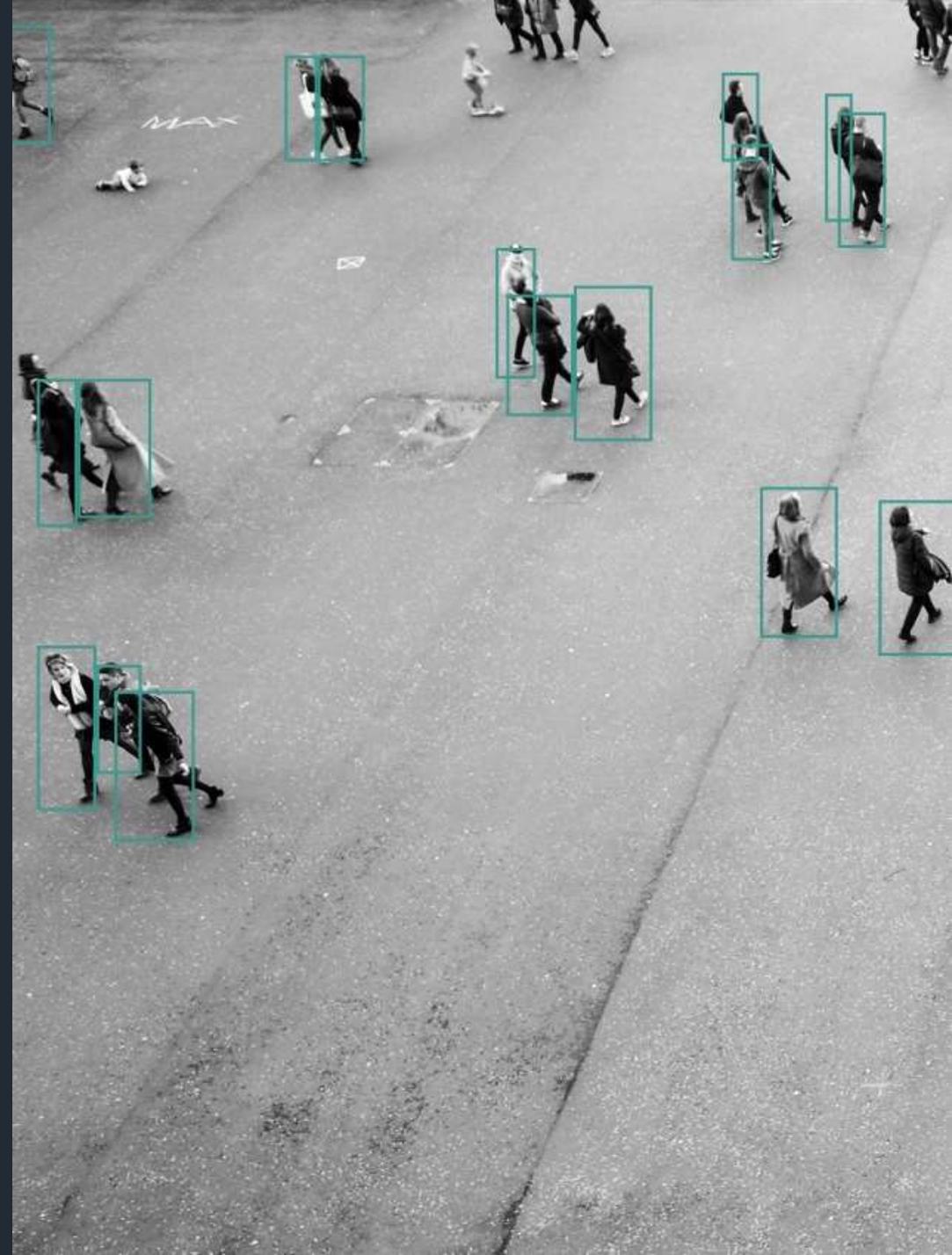
In real life, the size and power consumption of the device matters.

Cost Constraints

Most of the times success of the application is dependant on price

Talent and R&D Budget

ML is a new field, recruiting a team with the right knowledge and balancing the R&D budget is hard.



Paths

Model Downsizing

Downsize the model to your application requirements, if you only need 3 classes don't use a 30 class model

Model Optimization

Model quantization works. Up to 40% in size with 5% in accuracy

Hardware Acceleration

ASIC , FPGA, Tensor Core, hardware acceleration is key if you need realtime performance

Iterate

Iterate, iterate, iterate.



Example

**Autonomous traffic counting sensor
with machine learning object classification.**

Applications

Person traffic counting

Vehicle traffic counting

Parking space analysis

Custom object detection and tracking



Edge Ai Use Cases

Surveillance and Monitoring

Demographic analytics for advertising

Autonomous Vehicles

Predictive Maintenance

Text To Speech

Audio Event Detection





Obrigado

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