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TinyML: The next wave in AI



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THANK YOU!



@Danysolism

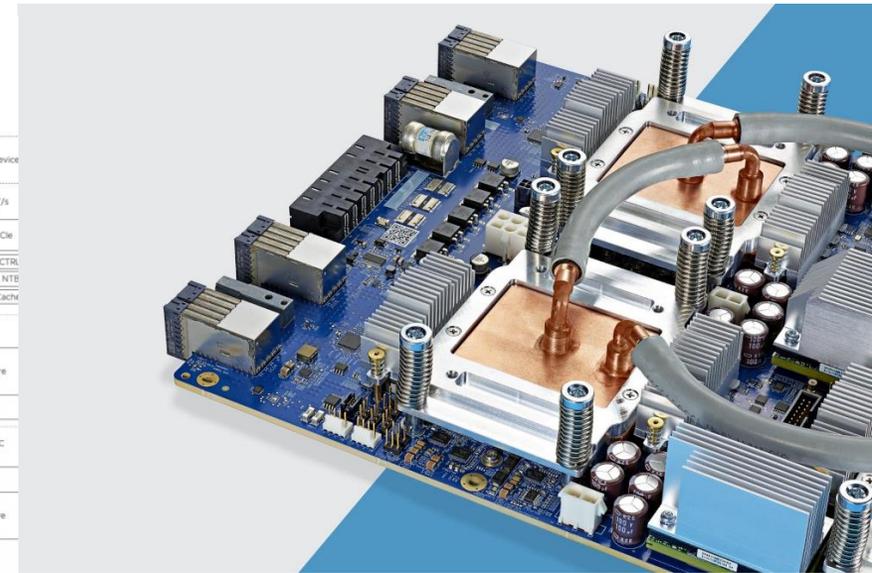
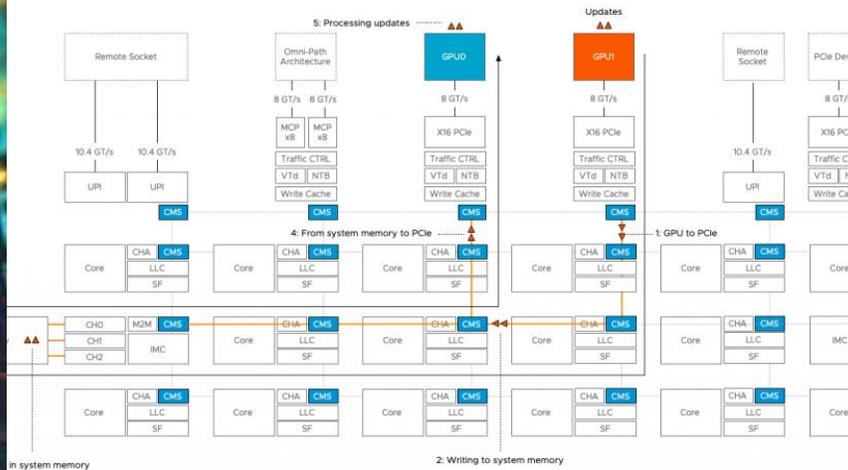
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Daniela Solis

AI Team Lead

Keen interest in technology and with deep knowledge in Artificial Intelligence and Software Engineering. Over the past few years, I have been captivated by developments in Machine Learning, Computer Vision and Natural Language Processing mainly using Deep Learning.

AI Improvements

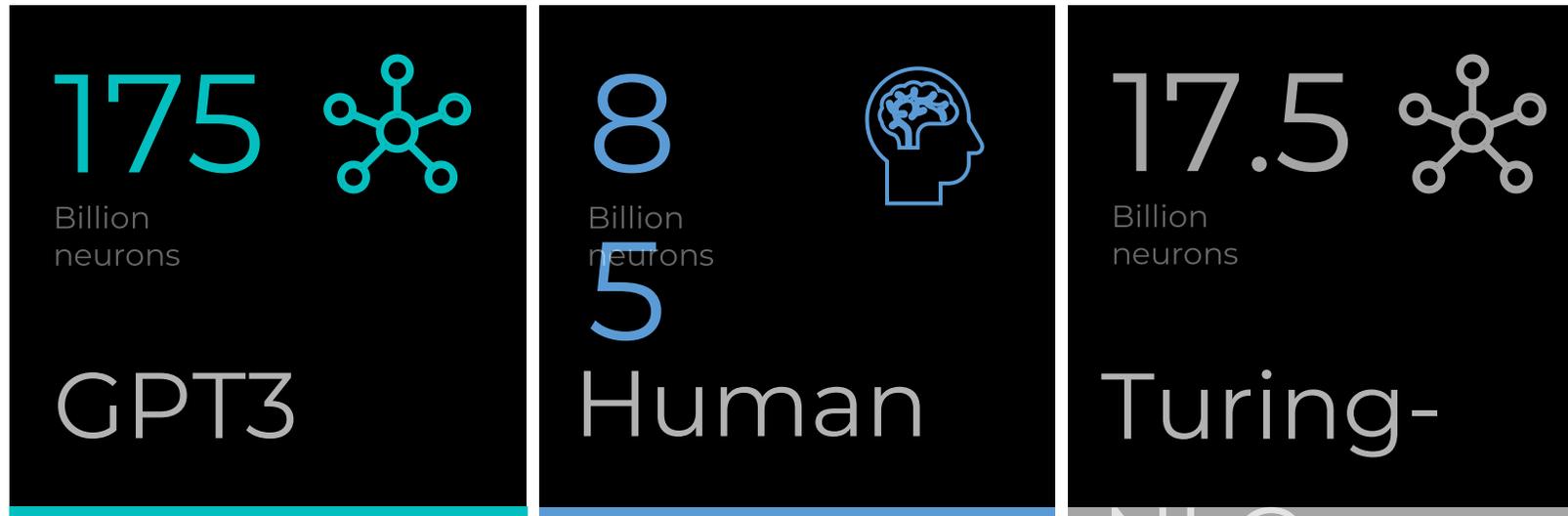


Big data
Access to information

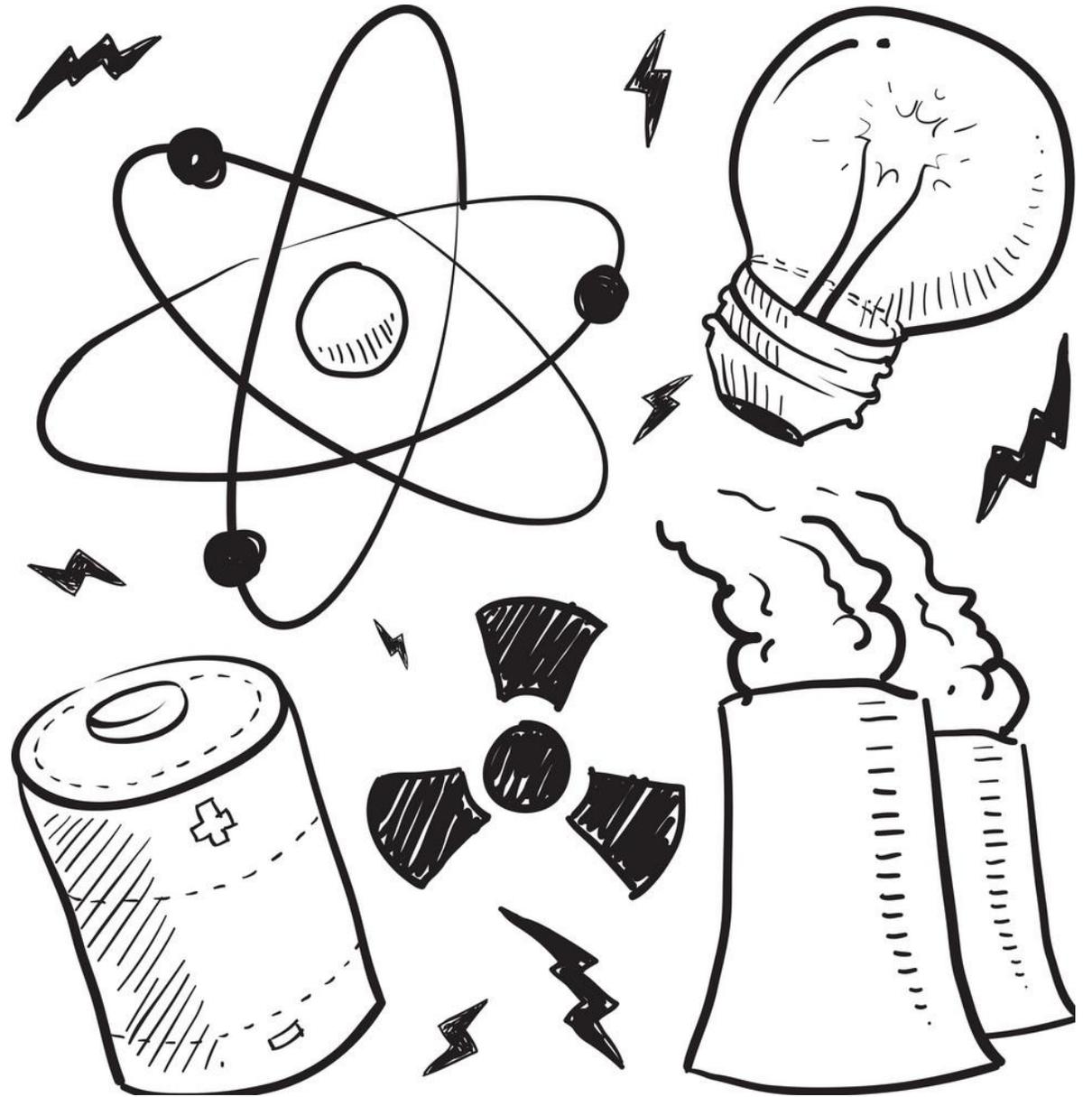
Model Architectures
Distributed Deep Learning

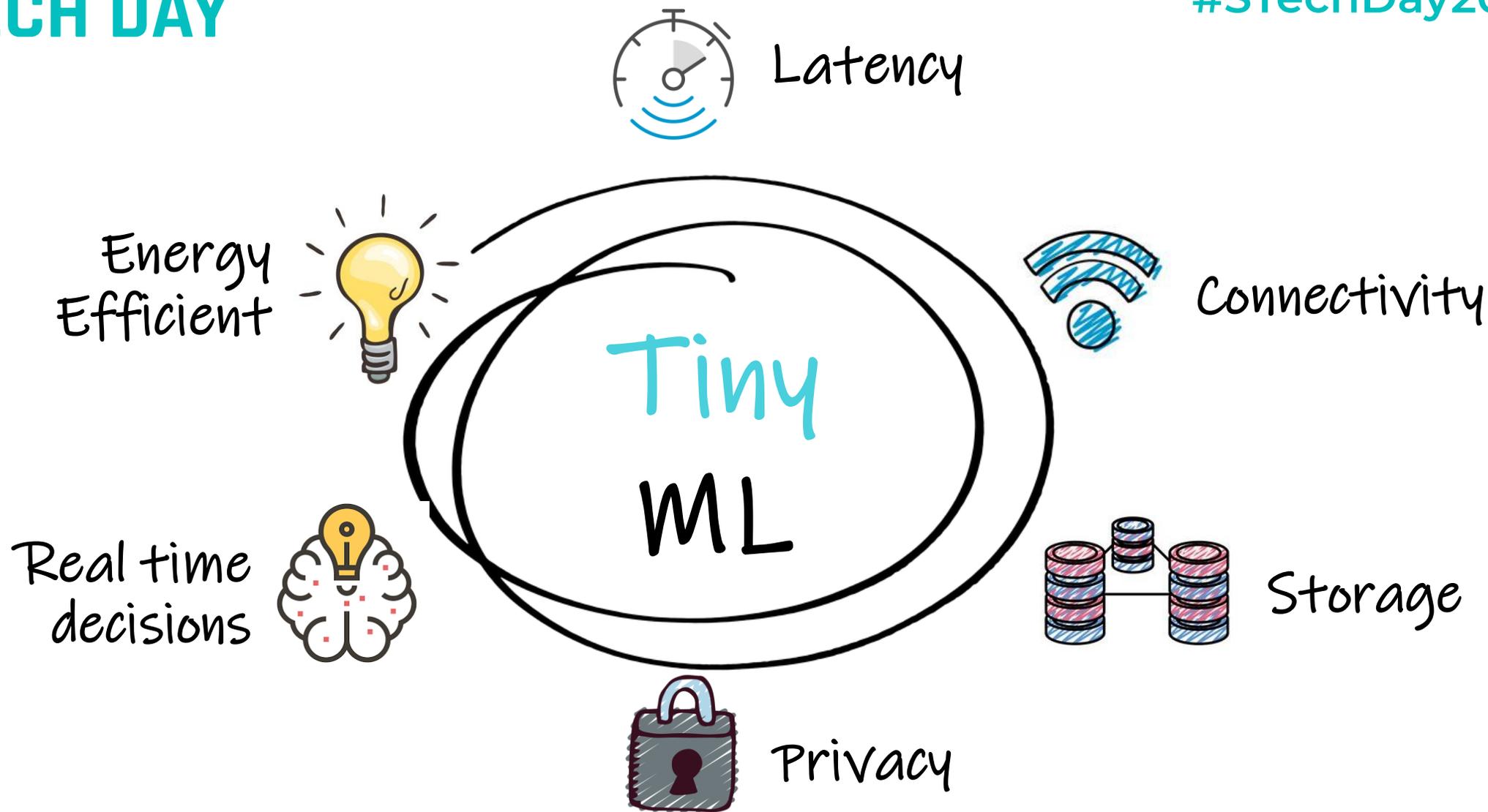
Processor Speed
Tensor processing units

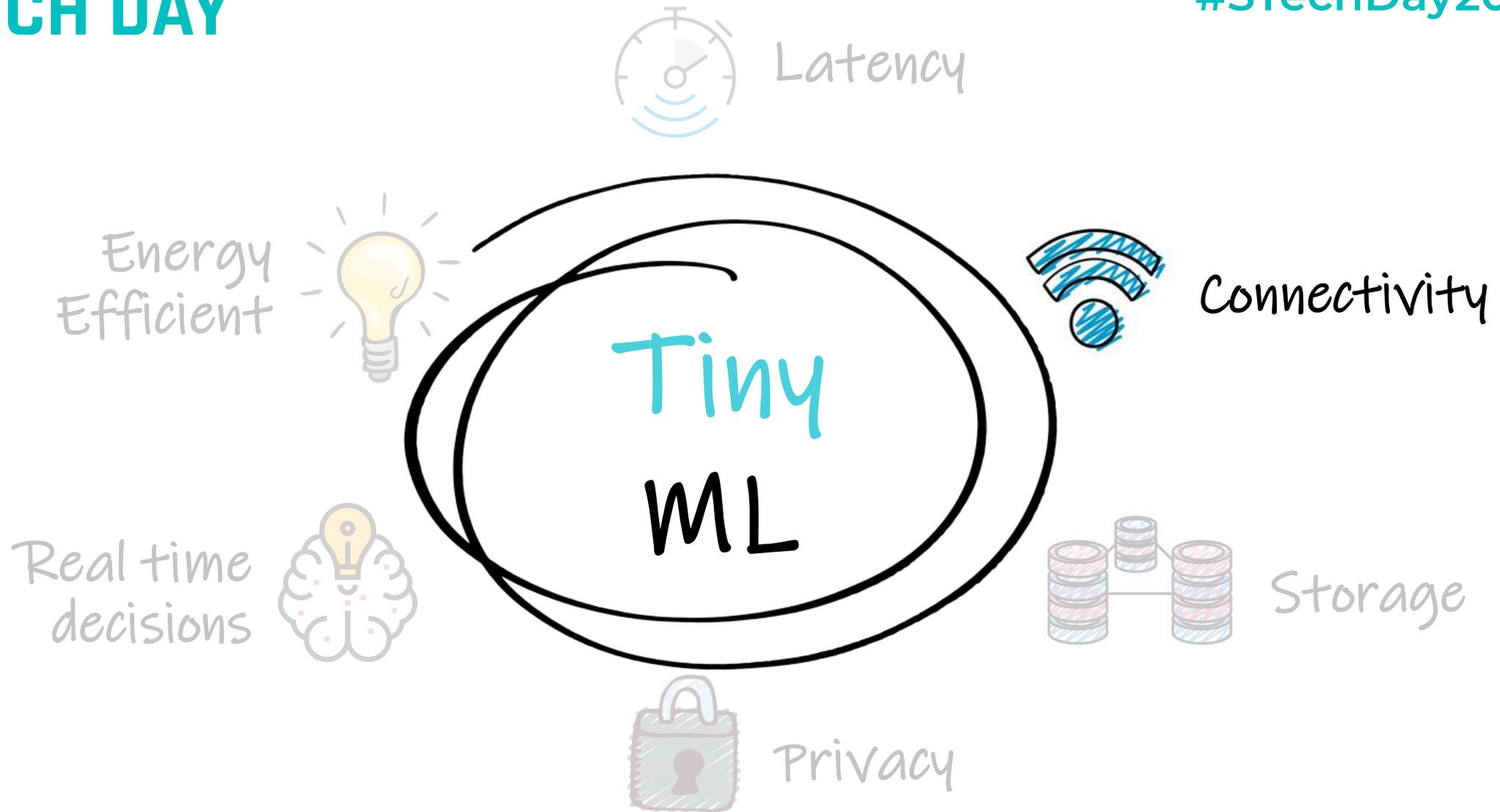
GPT-3



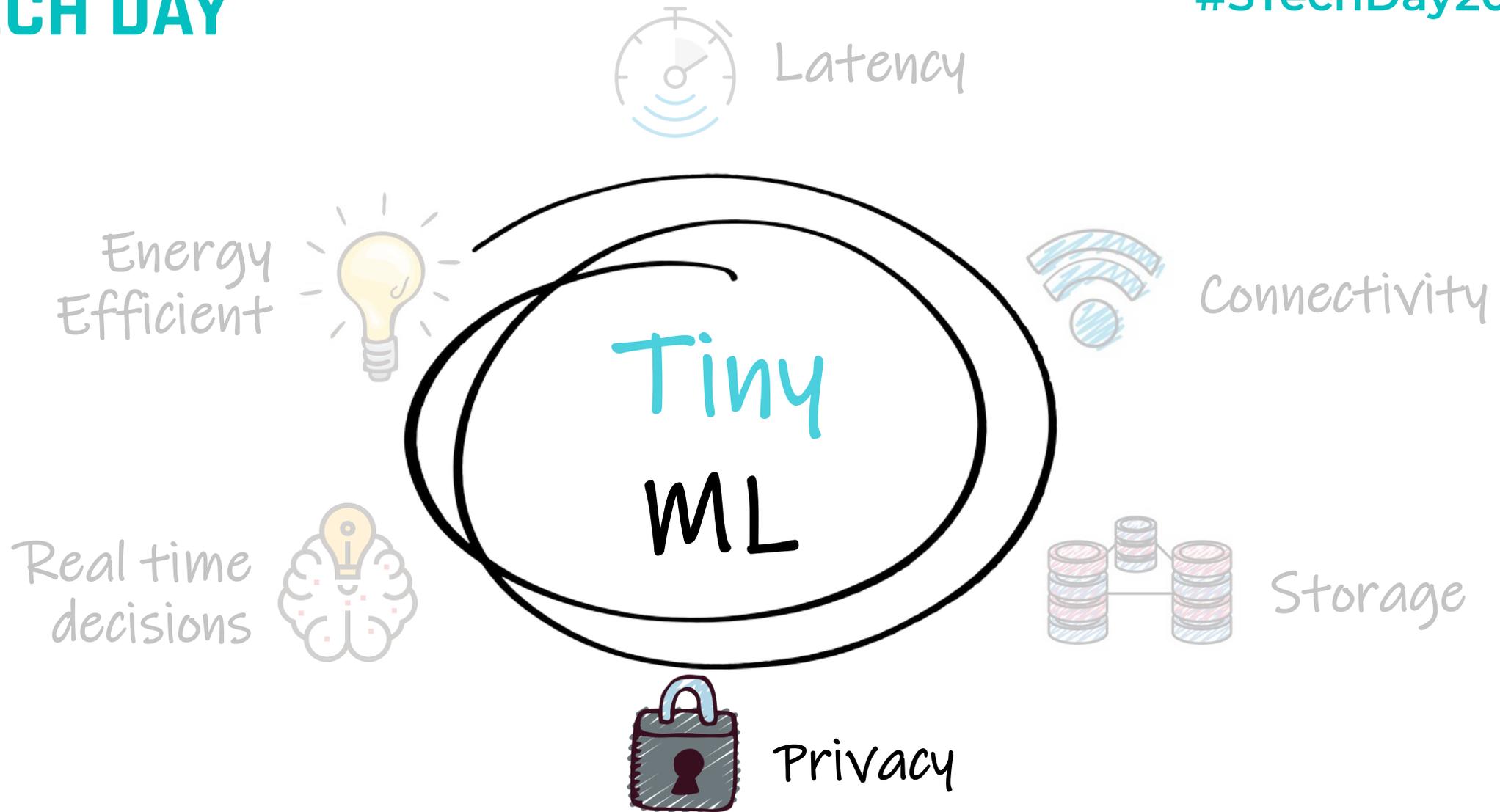
GPT-2 626,155 pounds
of CO₂ emissions
~ **Total lifetime** carbon
footprint of **5 cars**

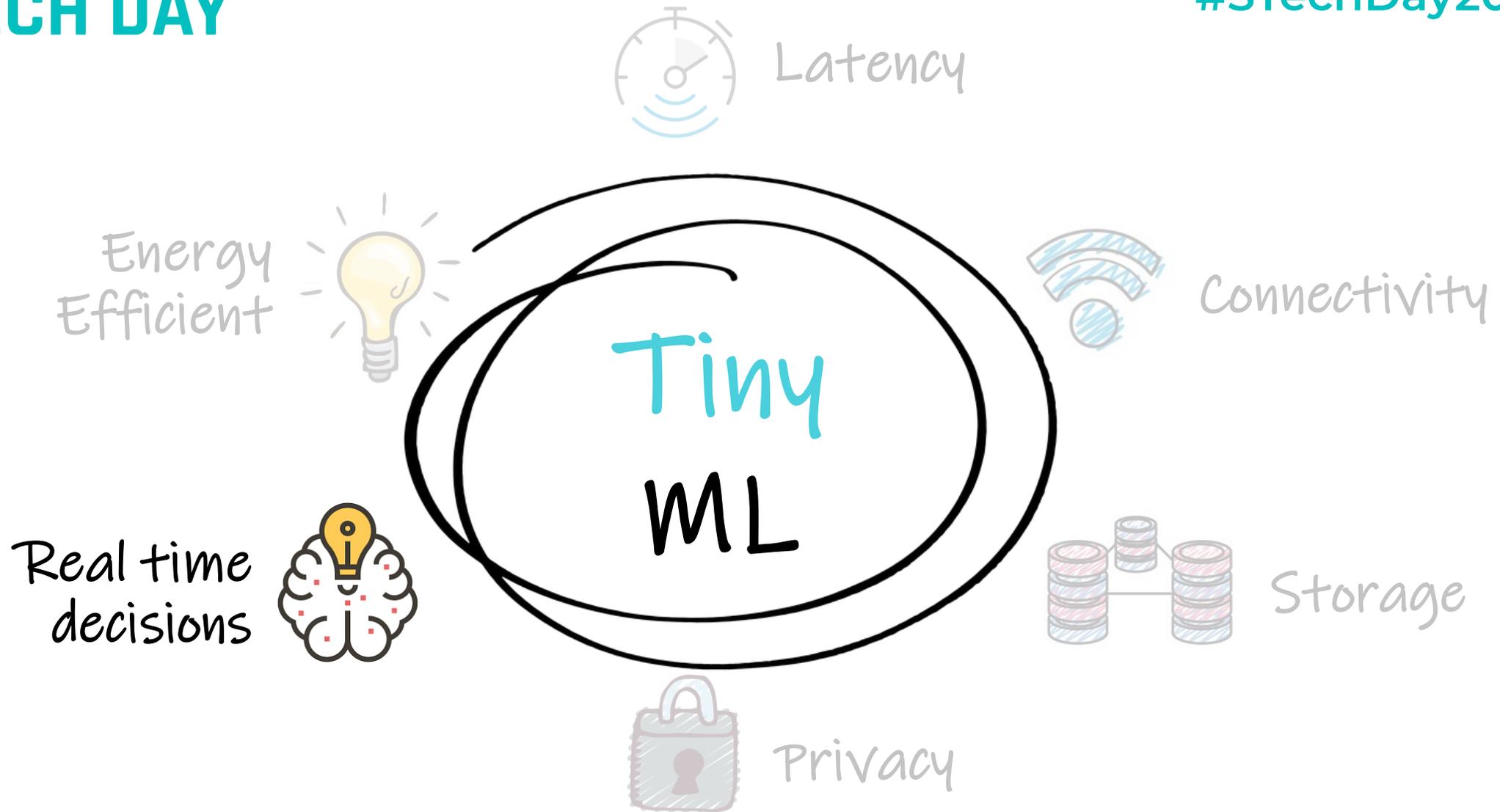


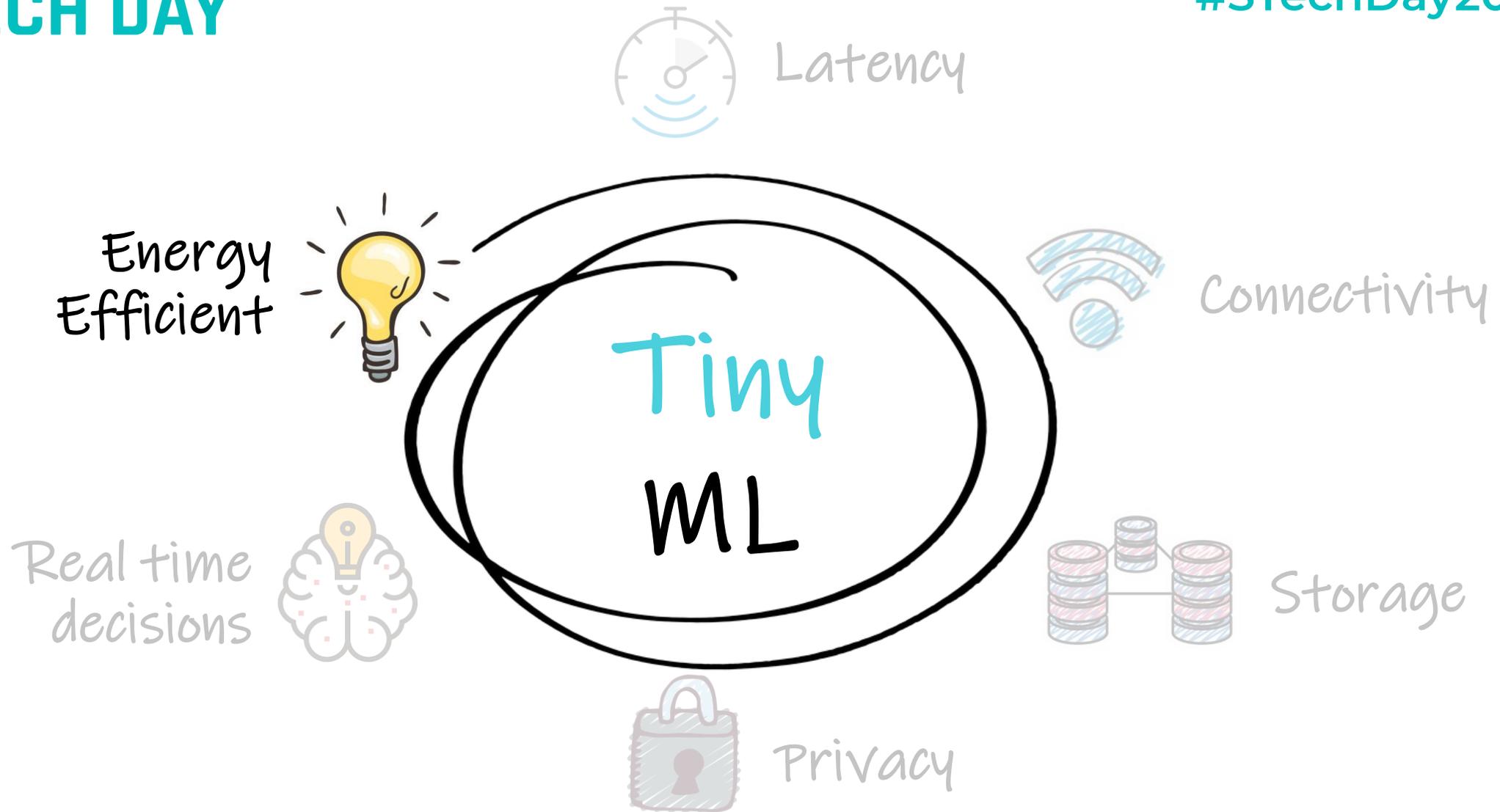


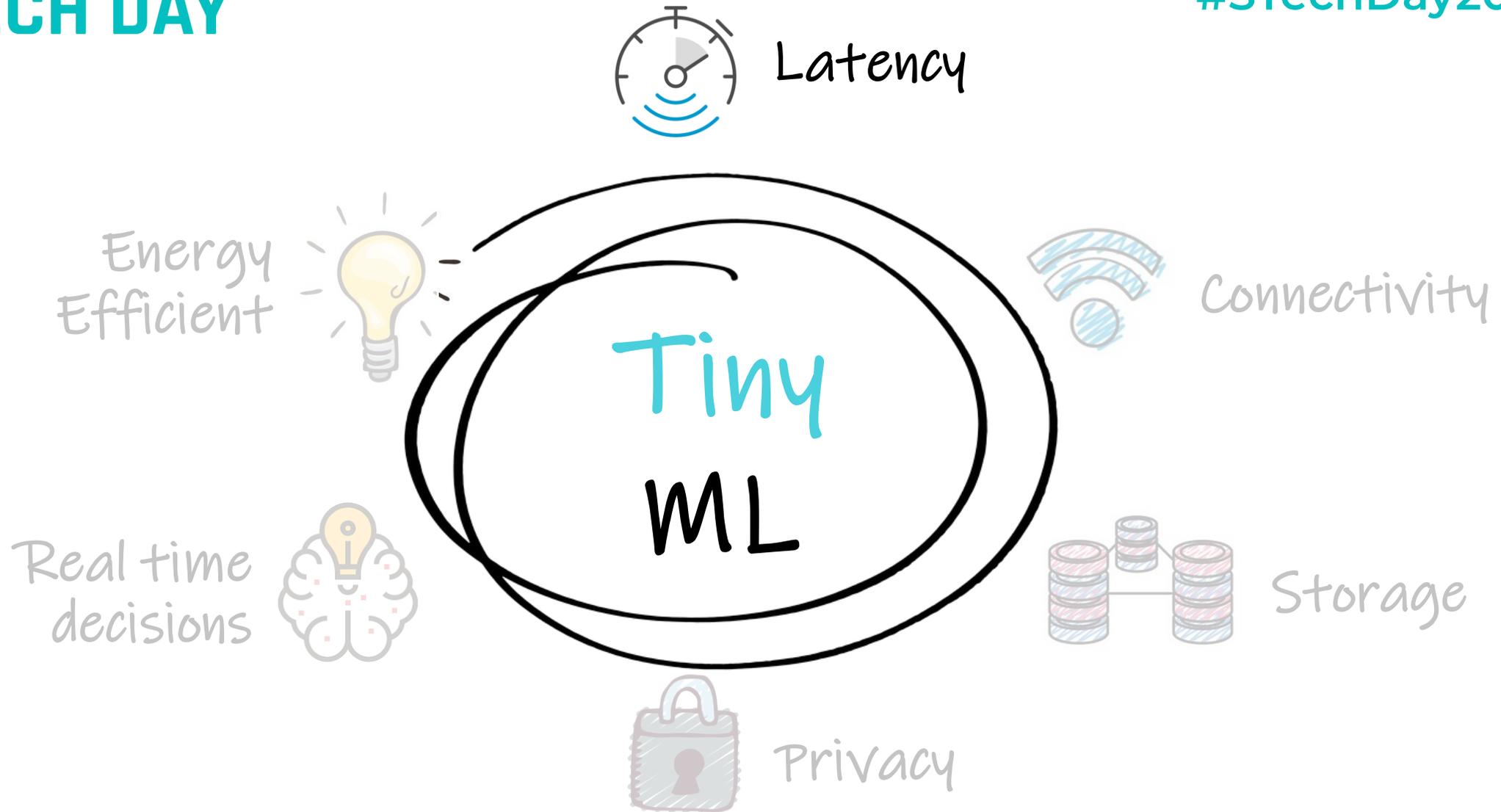












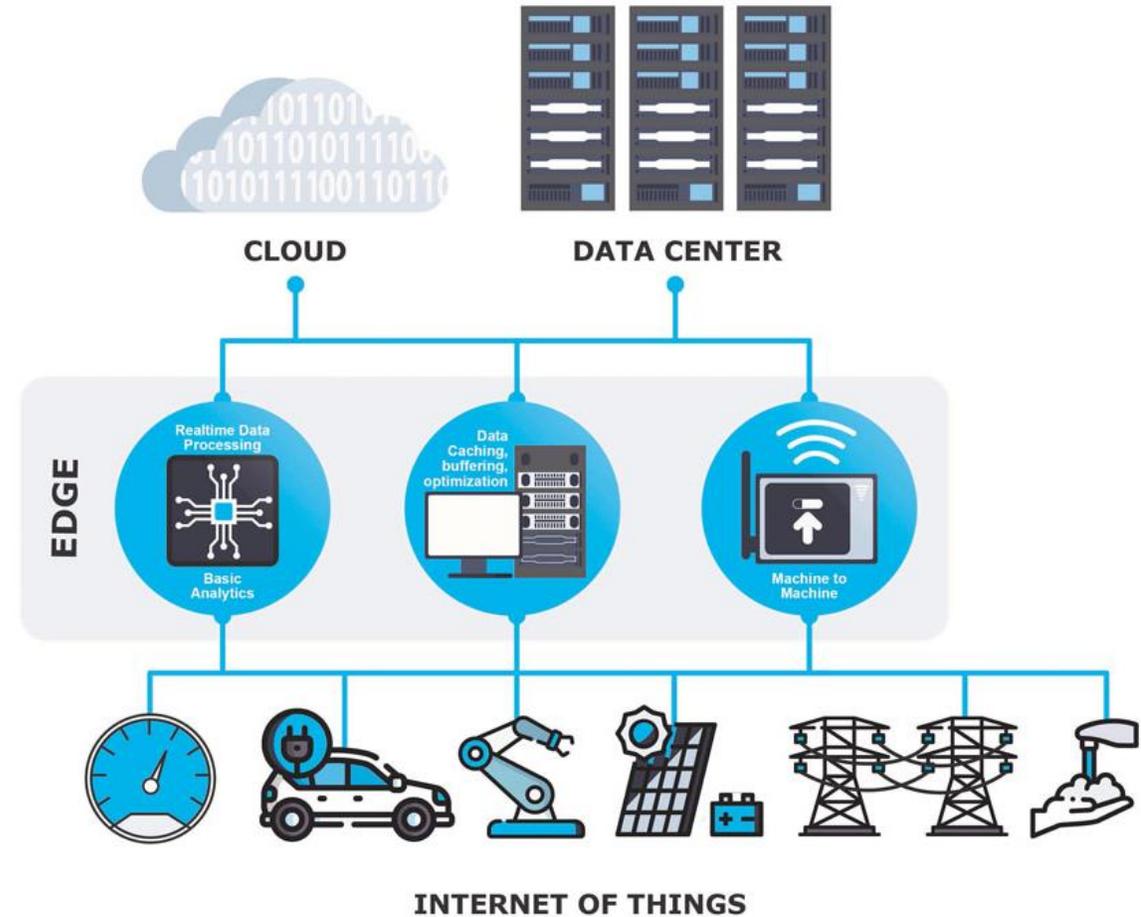
Edge Computing

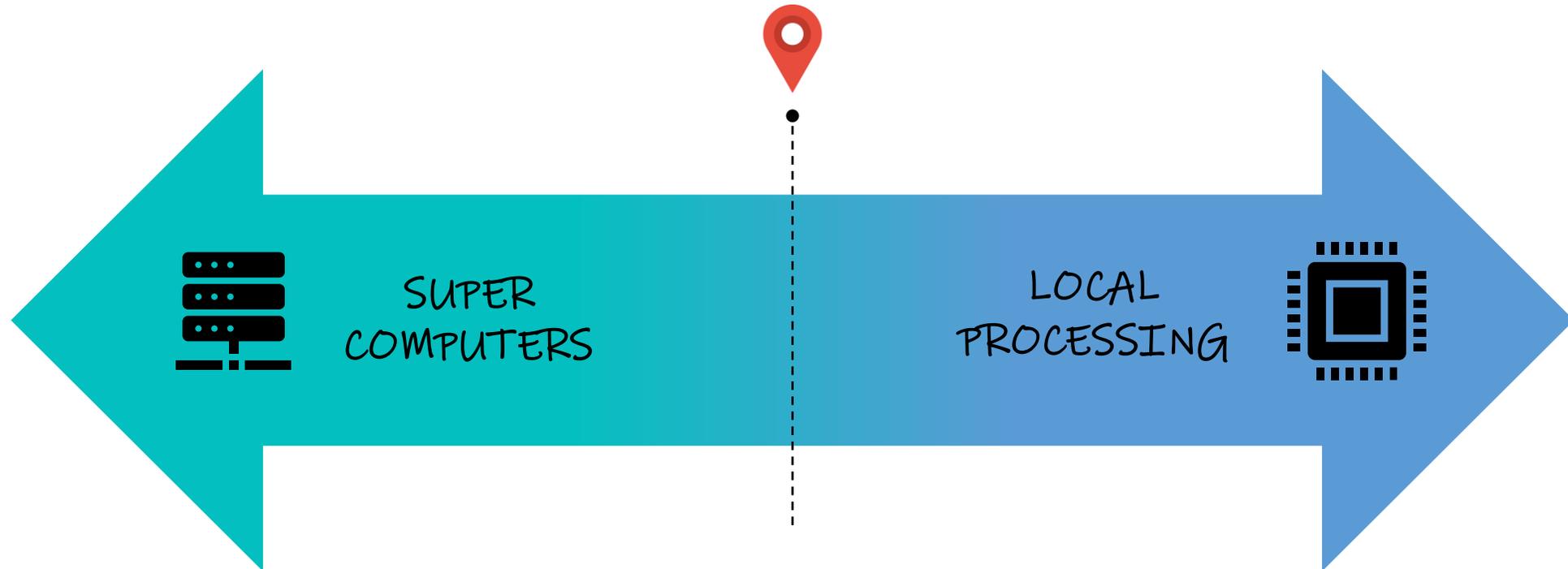
Bringing intelligence to the Edge

Memory computation and power constraints → efficient algorithms

Improving models efficiency regardless of size

Avoid impact in accuracy





Now a days, IoT devices and embedded machine learning modes are everywhere.

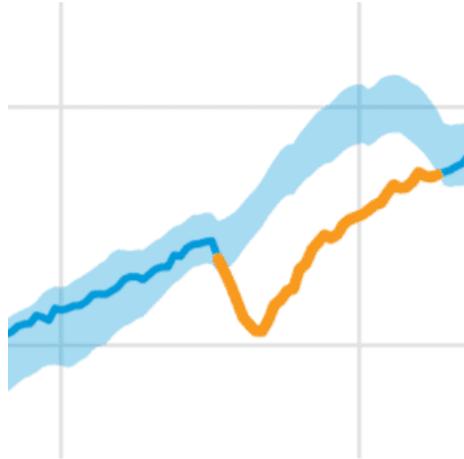


TinyML Challenges

Deploying Neural networks in edge devices:

- Low memory
- Limited power to train and run
- Limited computational resources





Anomaly detection
Predictive maintenance



Face ID
Face and object recognition



Speech recognition
Speaker and emotion
recognition, wake
words



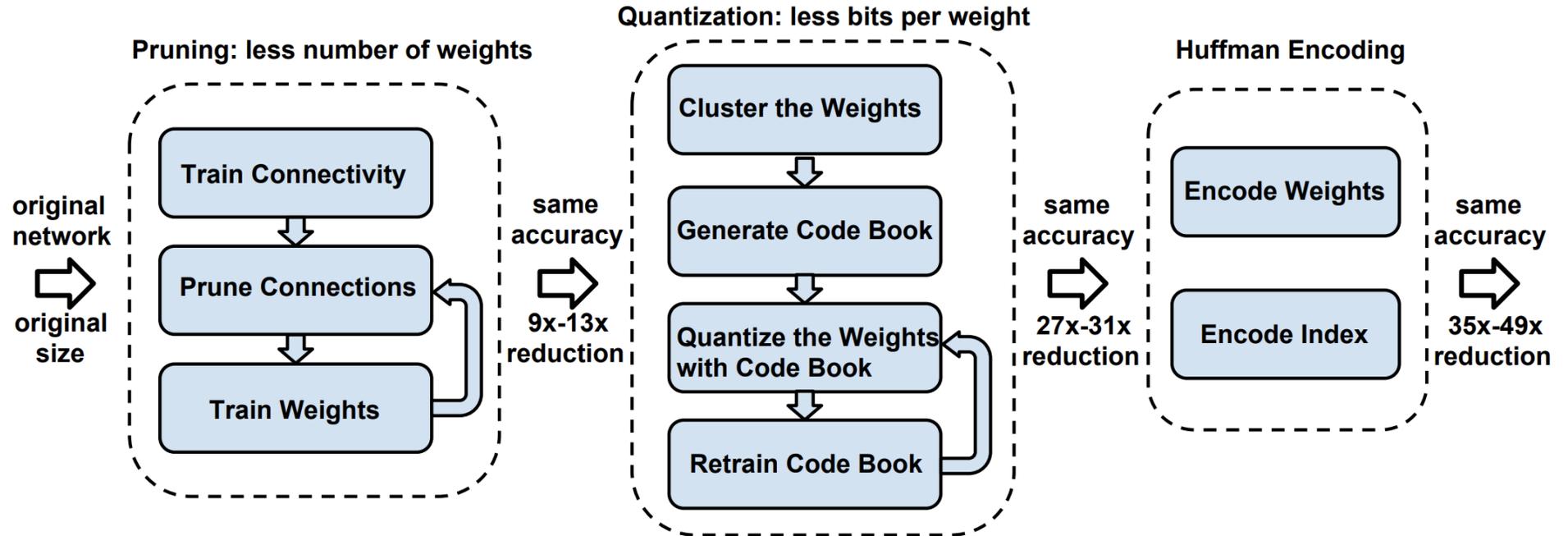
Scene Segmentation
Object detection and
segmentation



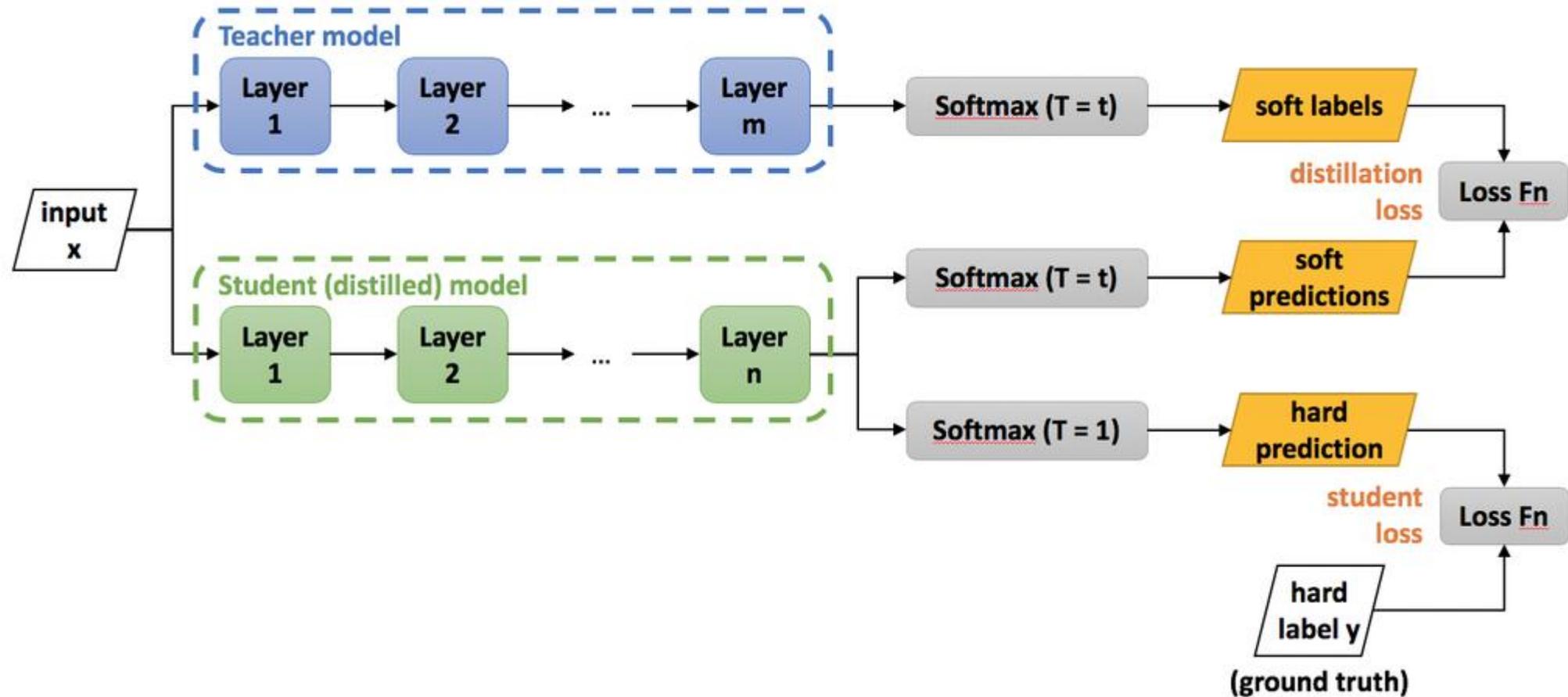
Smart Farming
Precision agriculture

TinyML Use Cases

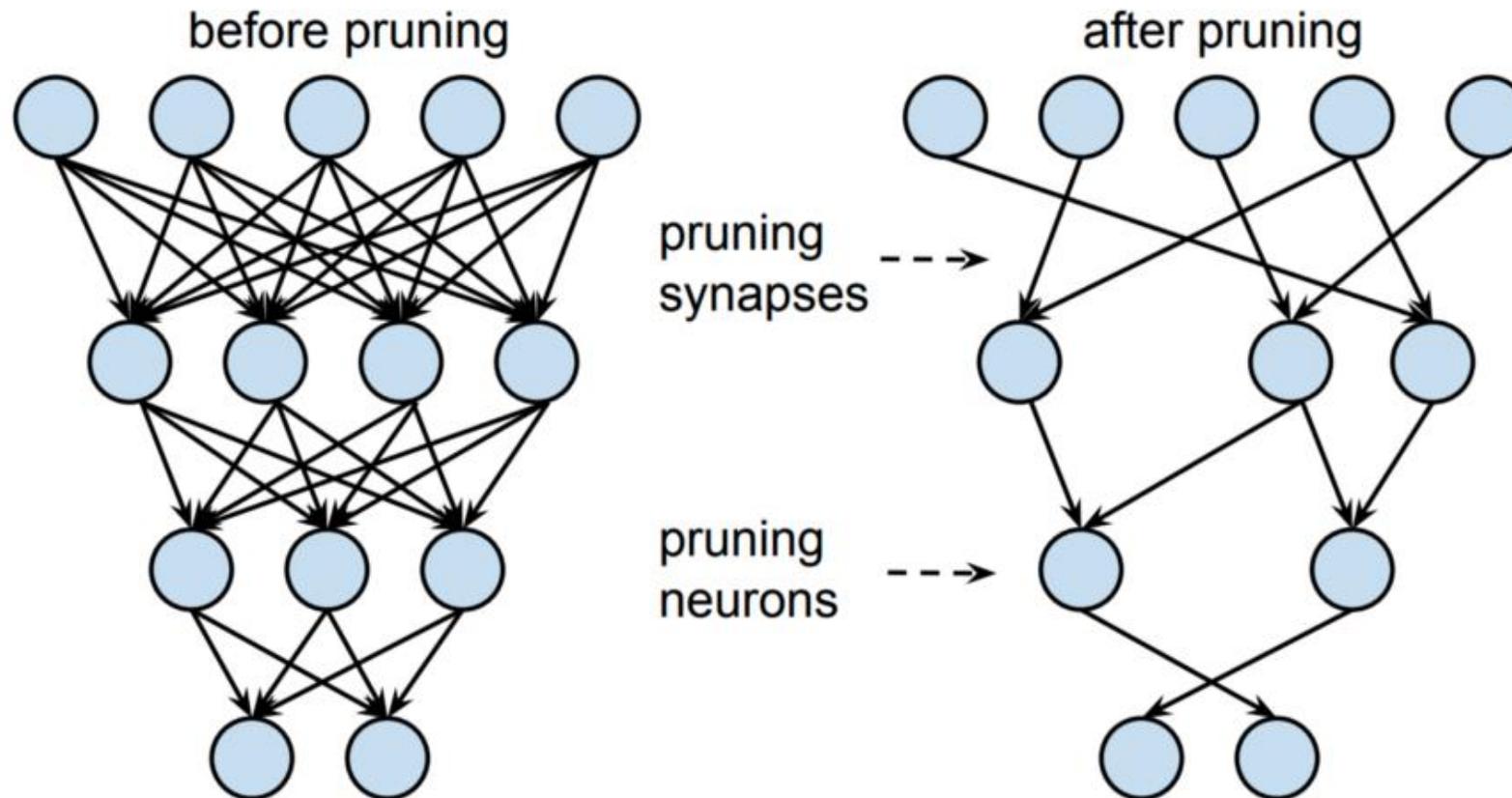
Deep Compression



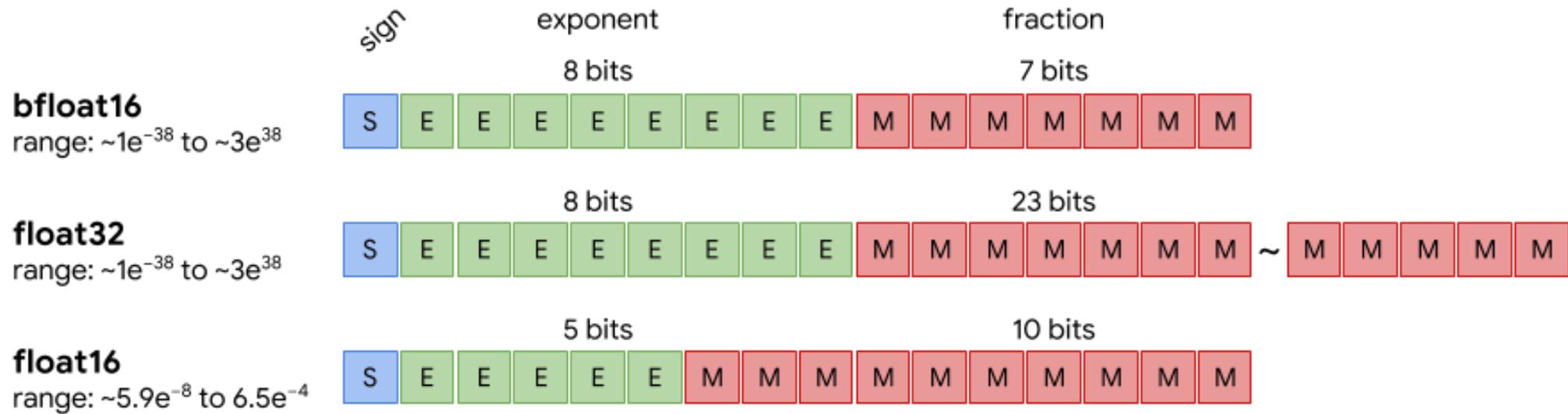
Model Distillation



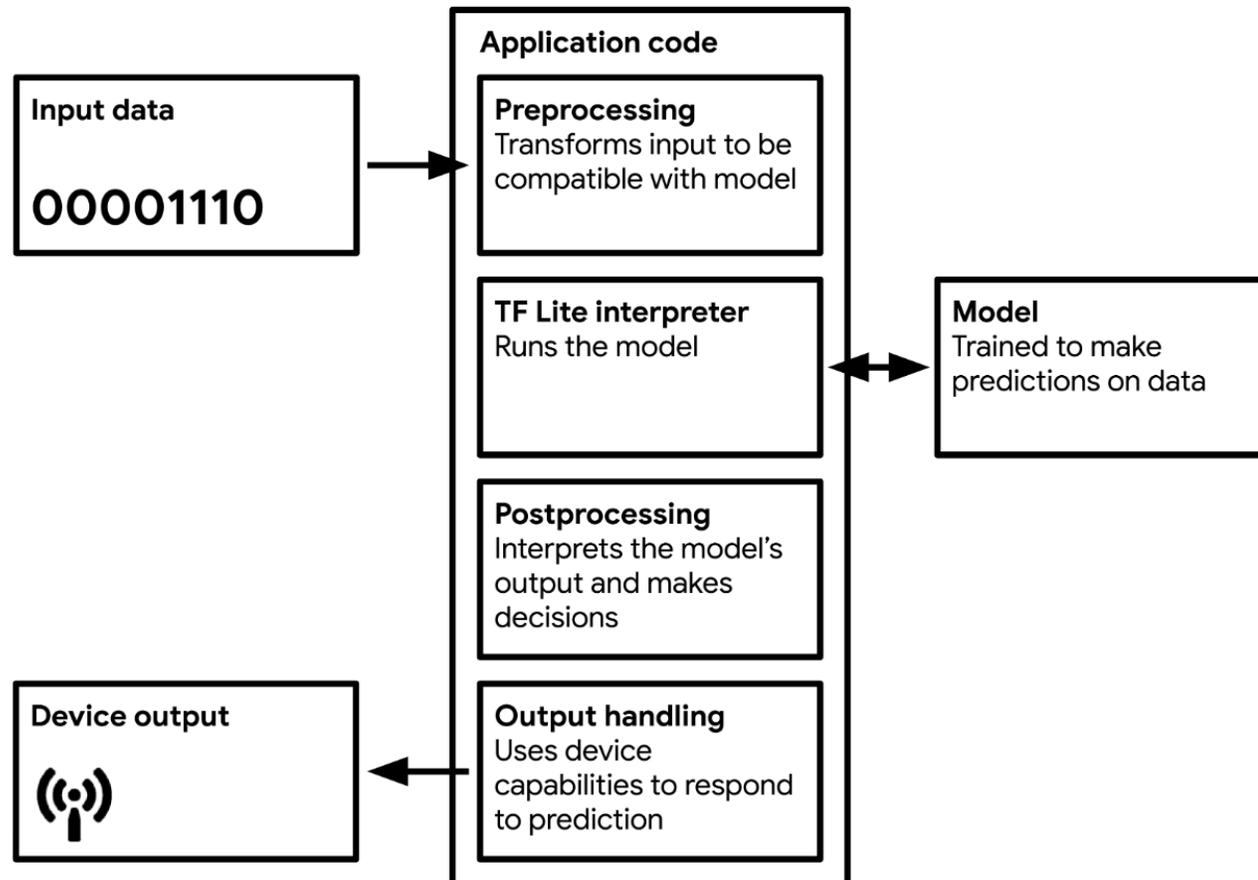
Model Pruning



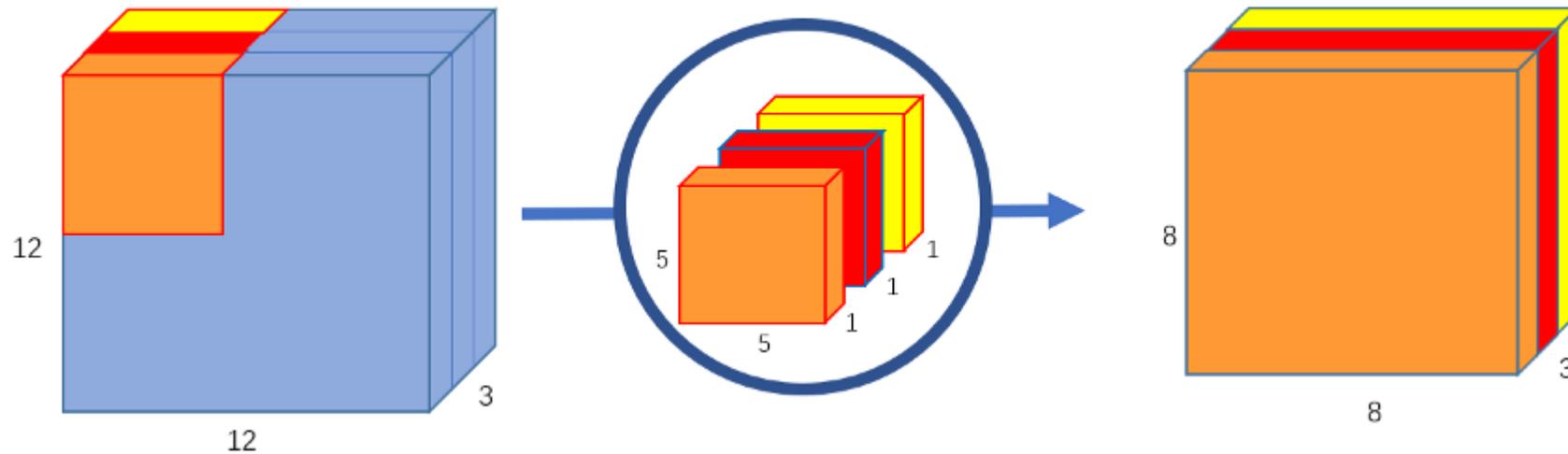
Quantization



Encoding and Compilation



Efficient Architectures



Depthwise convolution, uses 3 kernels to transform a 12x12x3 image to a 8x8x3 image



TO BE CONTINUED

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THANKS AND...

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SEE YOU SOON!

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