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Making Edge AI a reality

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STMicroelectronics

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This enables AI

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This enables edge AI

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Ultra-low latency
Real-time applications

Reduced data transmission
Generate meaningful information

Enhanced privacy and security
No data sharing in the cloud

Lower cost of inference to enable a new class of operations

Sustainable on energy
Low data, Low power

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Marc Dupaquier • 2nd
Managing Director Artificial Intelligence Solution...
4d •

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REDEFINING WHAT A GREAT PRODUCT IS :

This is a real pump from my very own garage. In fact, this is a great pump, that has saved us from multiple flooding. So, kudos for the great pump making work...
However, judging from my recent experience, making great pumps might not be
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libraries in their pumps, without adding any Hardware and without the cost of running learning and inference cycles in a Cloud.
So being a great pump maker is being redefined as we talk, not only pumps will have to keep pumping and be reliable, but they will have to become self-aware...
@pumpmakers how great will yours be? #tinyML #NanoEdgeAI #STM32AI #pfeiffer

Want to know what great pump makers are doing ? Check out here Pump anomaly detection based on vibrations - STMicroelectronics - STM32 AI

"My great pump had actually collected debris from previous storms and was not operating when the storm came, resulting into a flooding that would have otherwise been avoided with the proper predictive maintenance."

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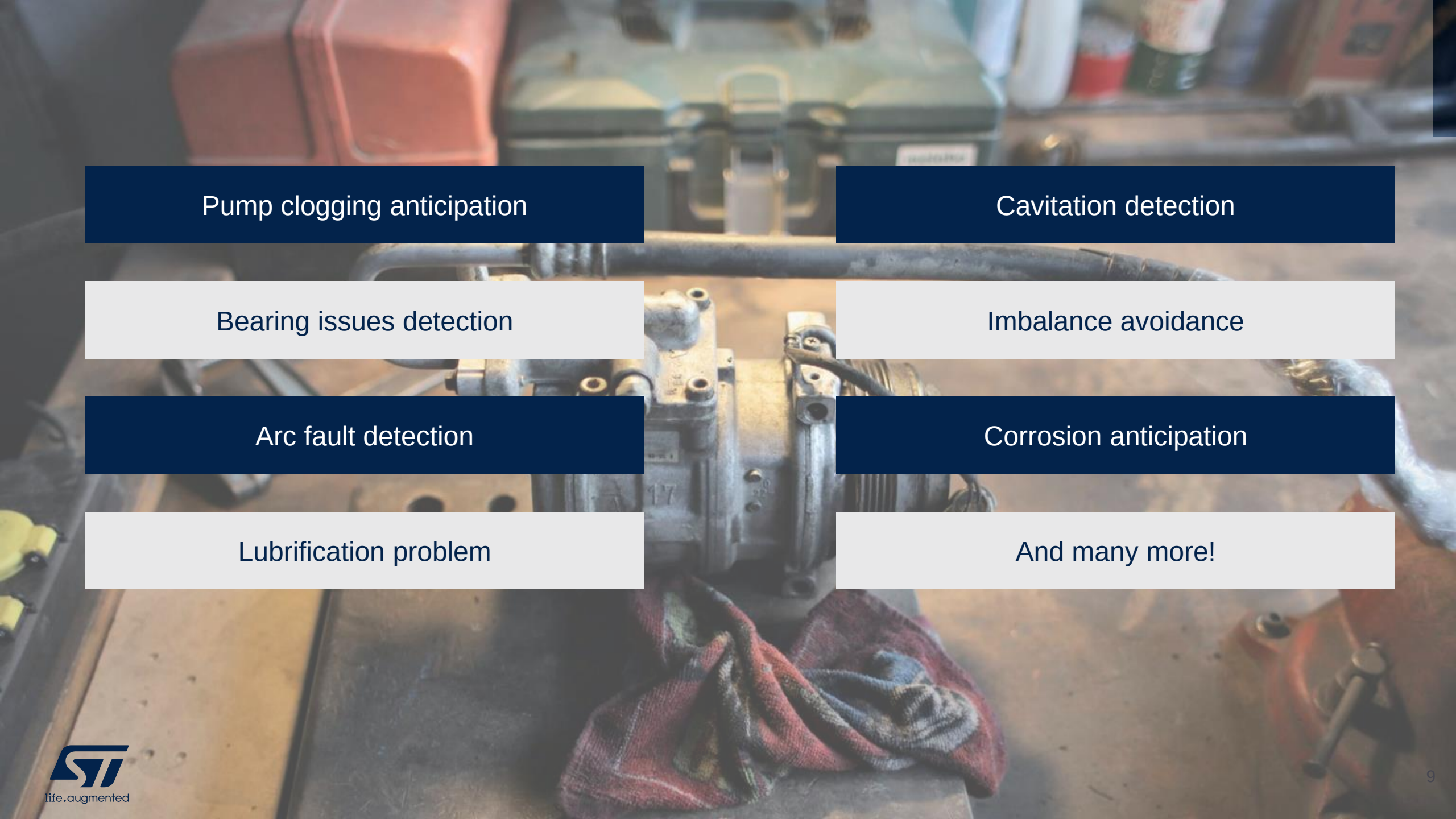

Pump clogging anticipation

Cavitation detection

Bearing issues detection

Imbalance avoidance

Arc fault detection

Corrosion anticipation

Lubrification problem

And many more!

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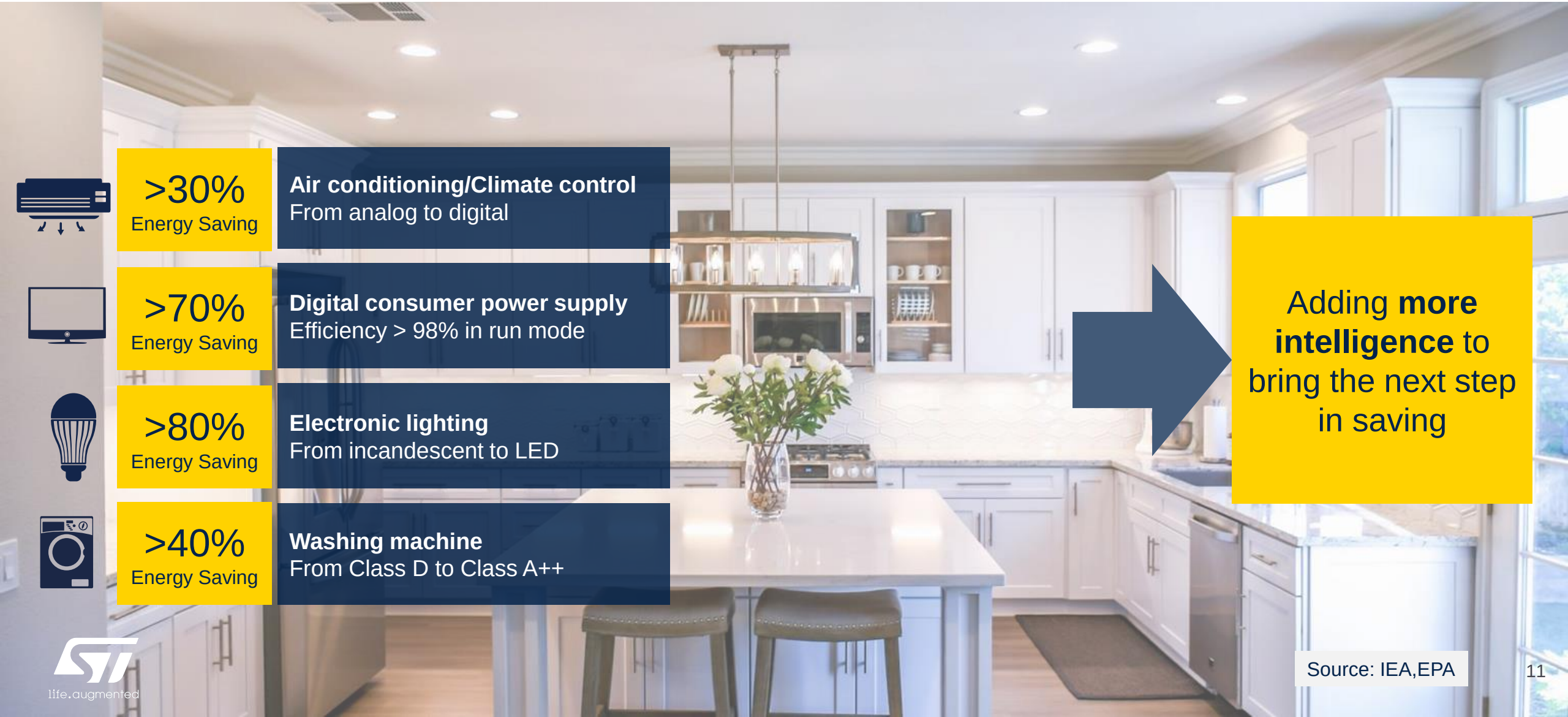
Reaching the limit of savings through power and analog



>30% Energy Saving	**Air conditioning/Climate control** From analog to digital
>70% Energy Saving	**Digital consumer power supply** Efficiency > 98% in run mode
>80% Energy Saving	**Electronic lighting** From incandescent to LED
>40% Energy Saving	**Washing machine** From Class D to Class A++

Adding **more intelligence** to bring the next step in saving

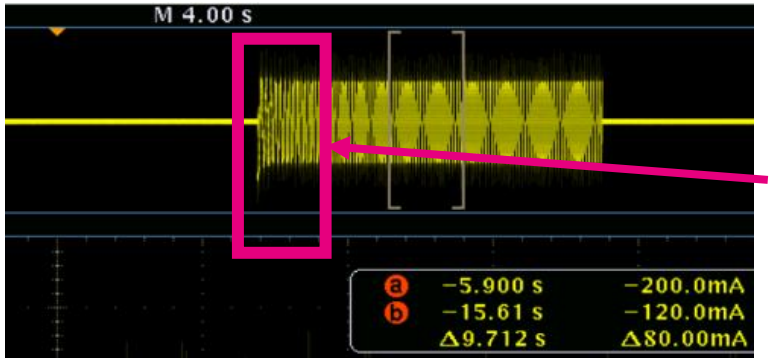
Source: IEA,EPA

Adding intelligence to save energy & resources

Combination of **edge AI clothes weighing,** and **advanced Motor control algorithms** reduce the amount of water and detergent used and significantly lowers start up current

Energy saving per washing cycle

~ 15-40%



No high peak current
Shorter start-up

Advanced motor control algorithms for sensorless start-up

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On-device learning for predictive maintenance

nke WATTECO

NANOEDGE AI STUDIO

OXYtronic

NANOEDGE AI STUDIO

“Installed in dozens of industrial sites across Europe and provides 24/7 predictive maintenance for thousands of equipment such as pumps, air conditioners, engines and HVAC’s.”

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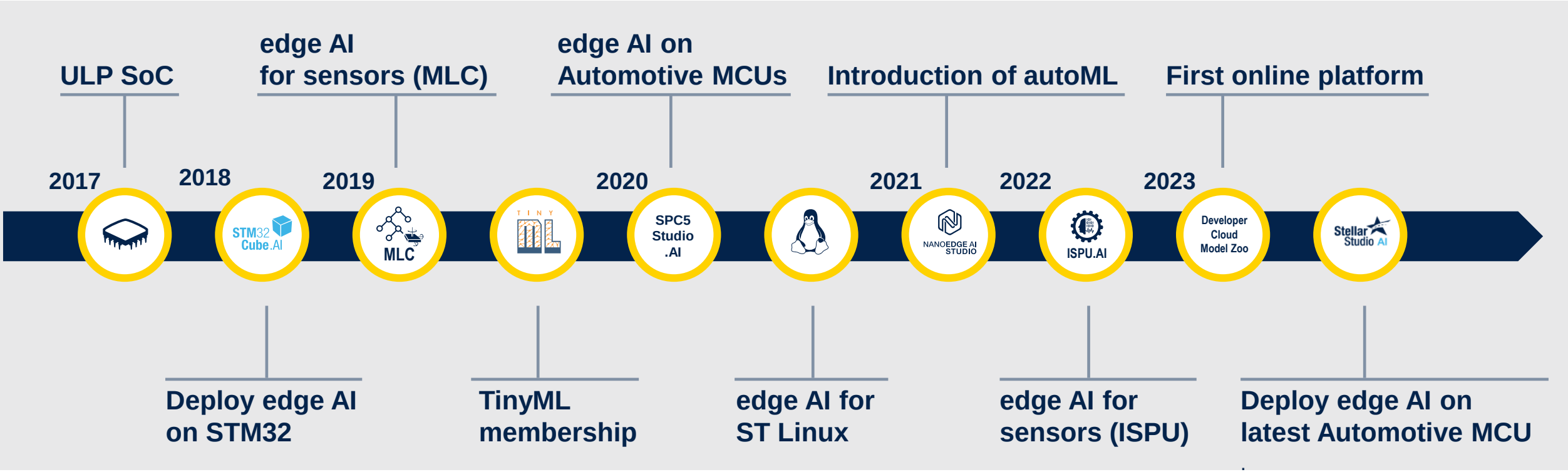
Enabling smarter devices, machines, and cars everywhere

How ST is enabling edge AI



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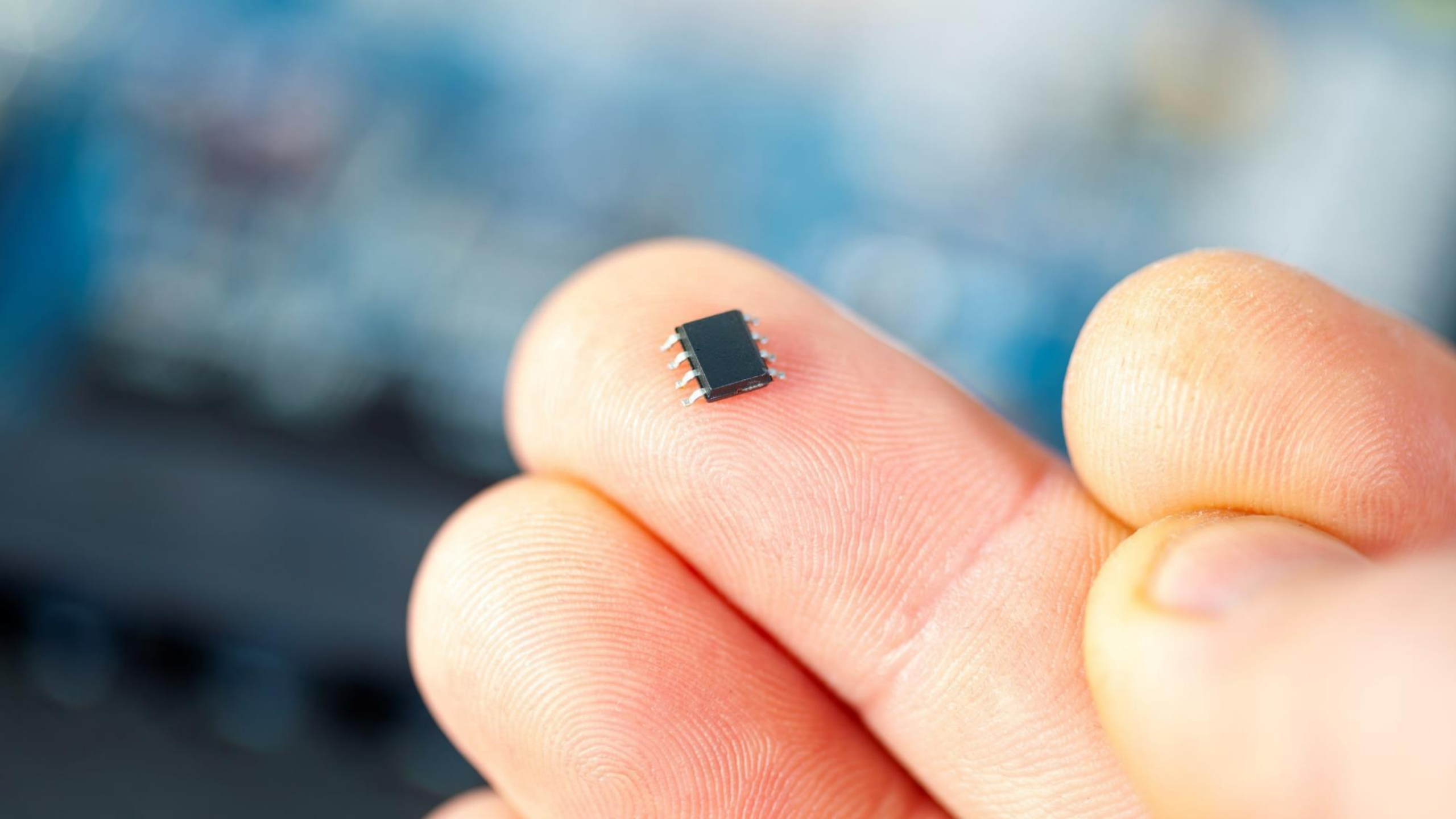
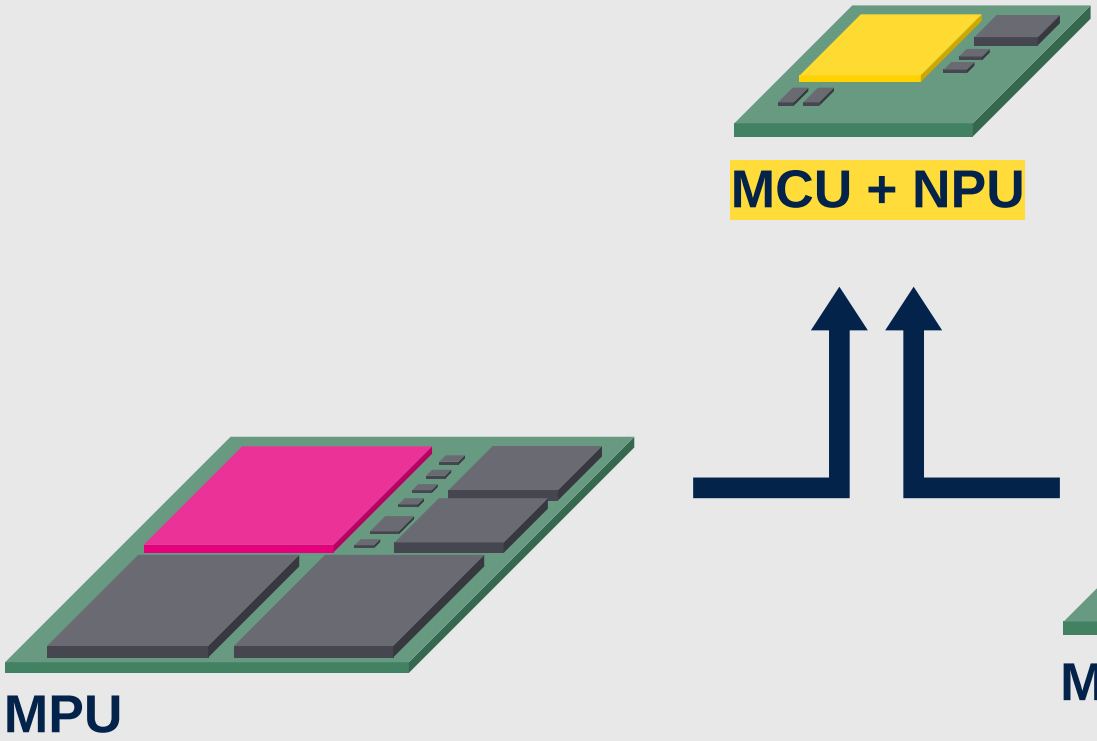


Neural network computing power with the advantages of an MCU

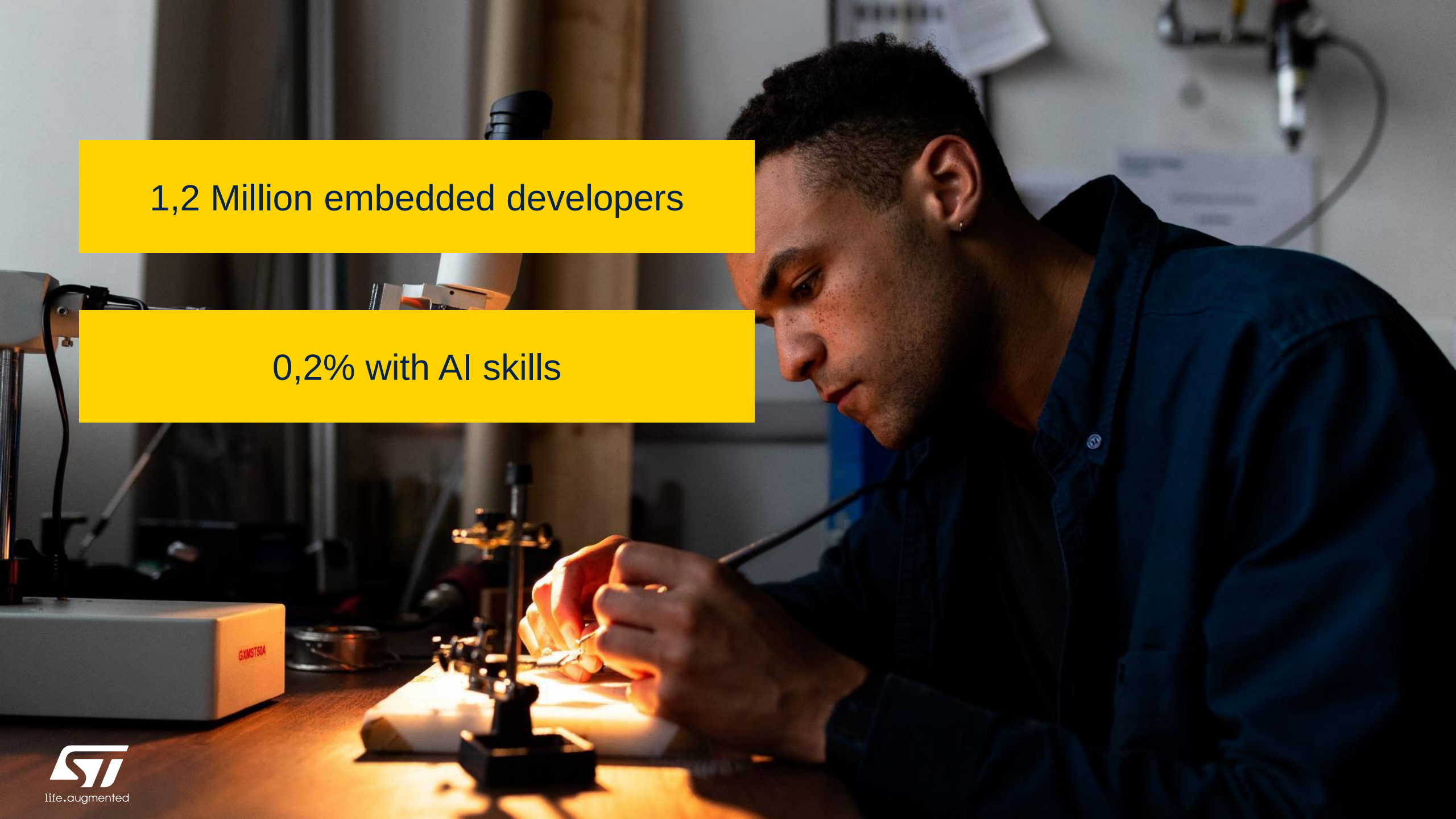


High Neural Processing capabilities

Small footprint
Lower power
Lower cost
Lower BOM

“Our goal is to make the creation of edge AI solutions simple, rapid, and more cost-effective than any other technology”

Remi El-Ouazzane, President Microcontrollers & Digital ICs Group, STMicroelectronics


1,2 Million embedded developers
0,2% with AI skills
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Simplify AI development workflow

NANOEDGE AI STUDIO

The **best combination** for given data:
edge AI model, hyperparameters and preprocessing

On-device learning capability to fine-tune deployed solution without retraining

No need to create/train edge AI models in AI frameworks

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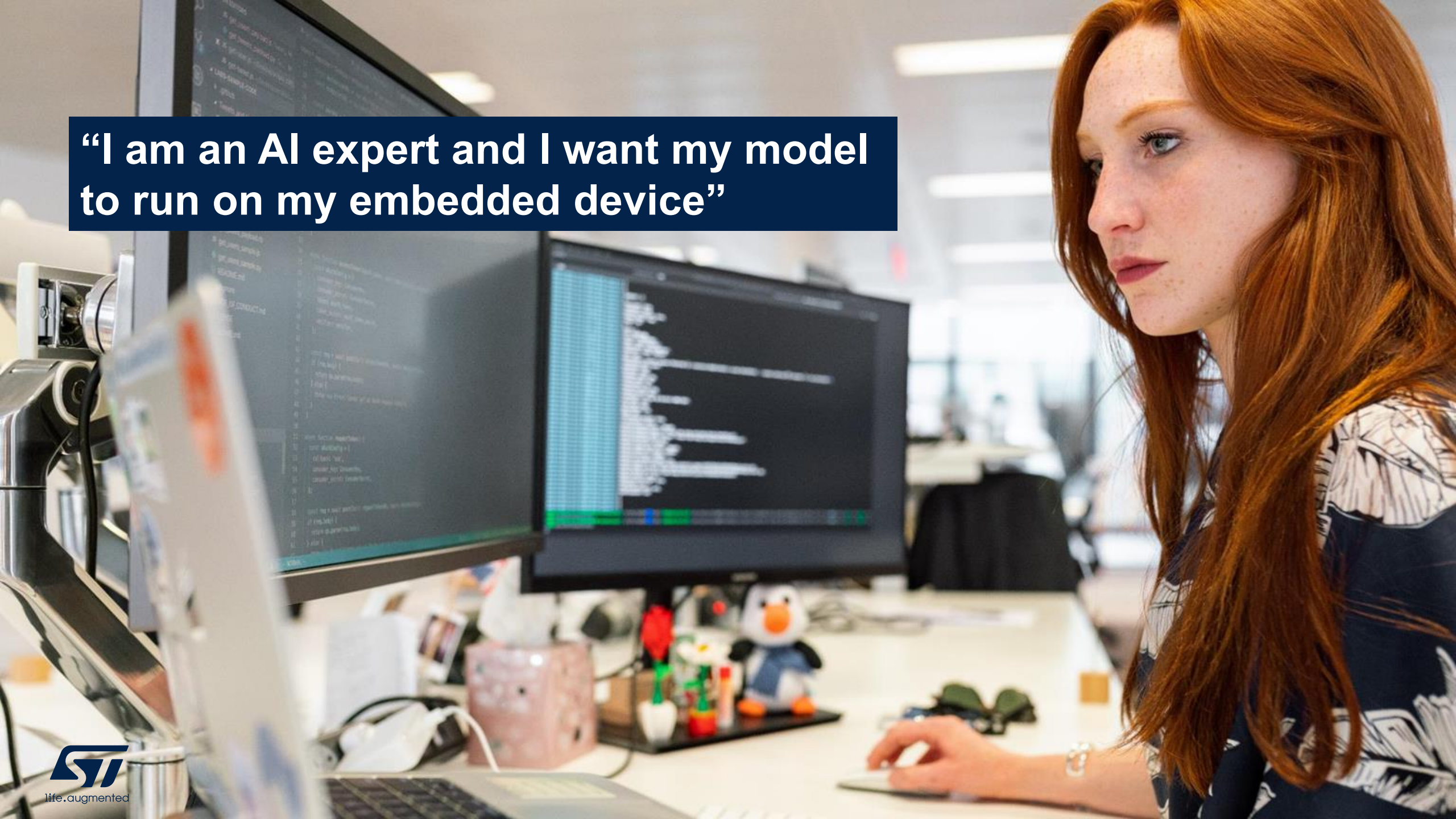

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Bring Your Own Model

Machine Learning

scikit learn

ONNX

Deep Learning

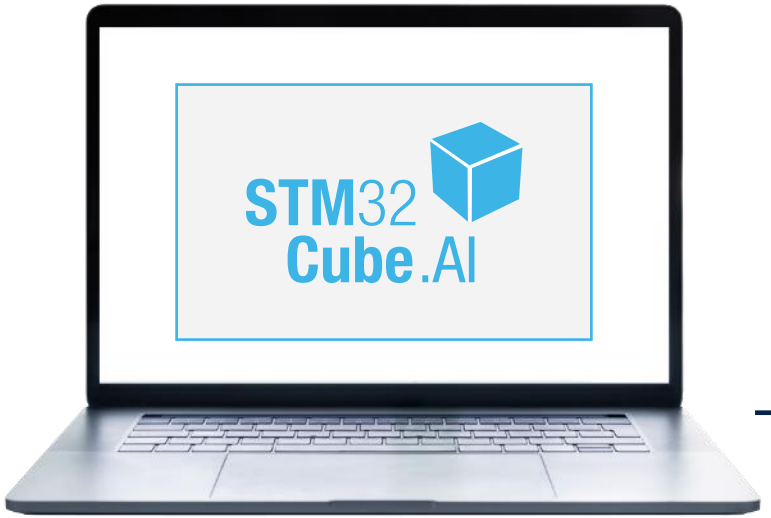
MATLAB

PyTorch

TensorFlow Lite

Keras

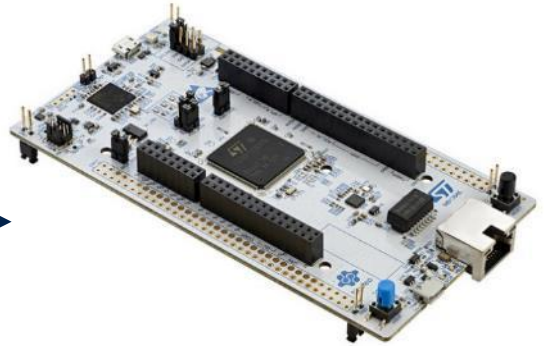
ONNX



Select MCU & upload your model

Optimize and validate

Generate project and deploy



HIGH PERFORMANCE EDGE AI PRODUCT

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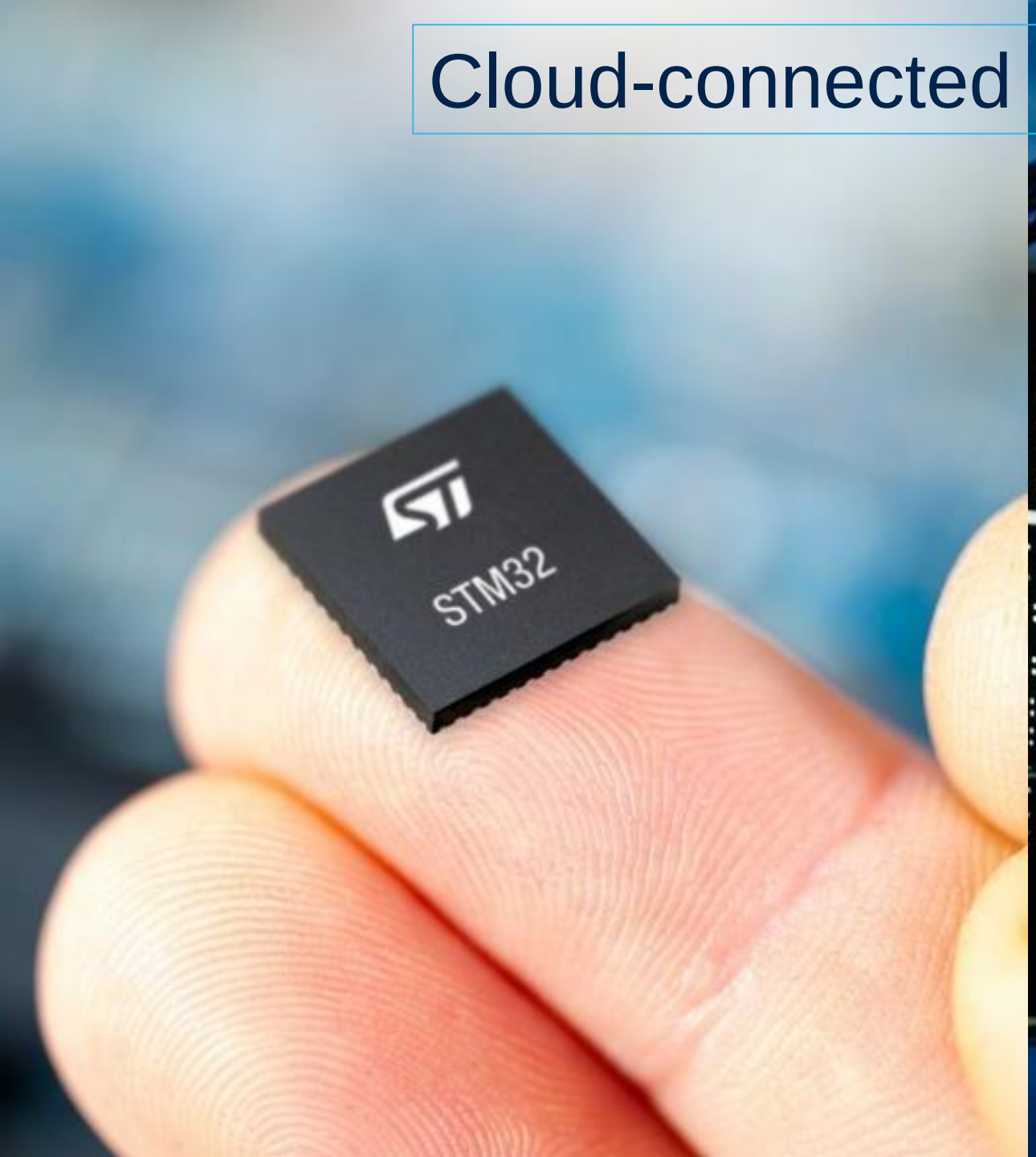
Cloud-connected intelligent edge



“A world of smart everything, where billions of things are more secure, more connected and more intelligent”

Efficient computing at the edge

Application-adapted connectivity between things and to the cloud

Security to authenticate devices and protect data

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Our technology starts with You

Find out more at stm32ai.st.com

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