tinyML® EMEA

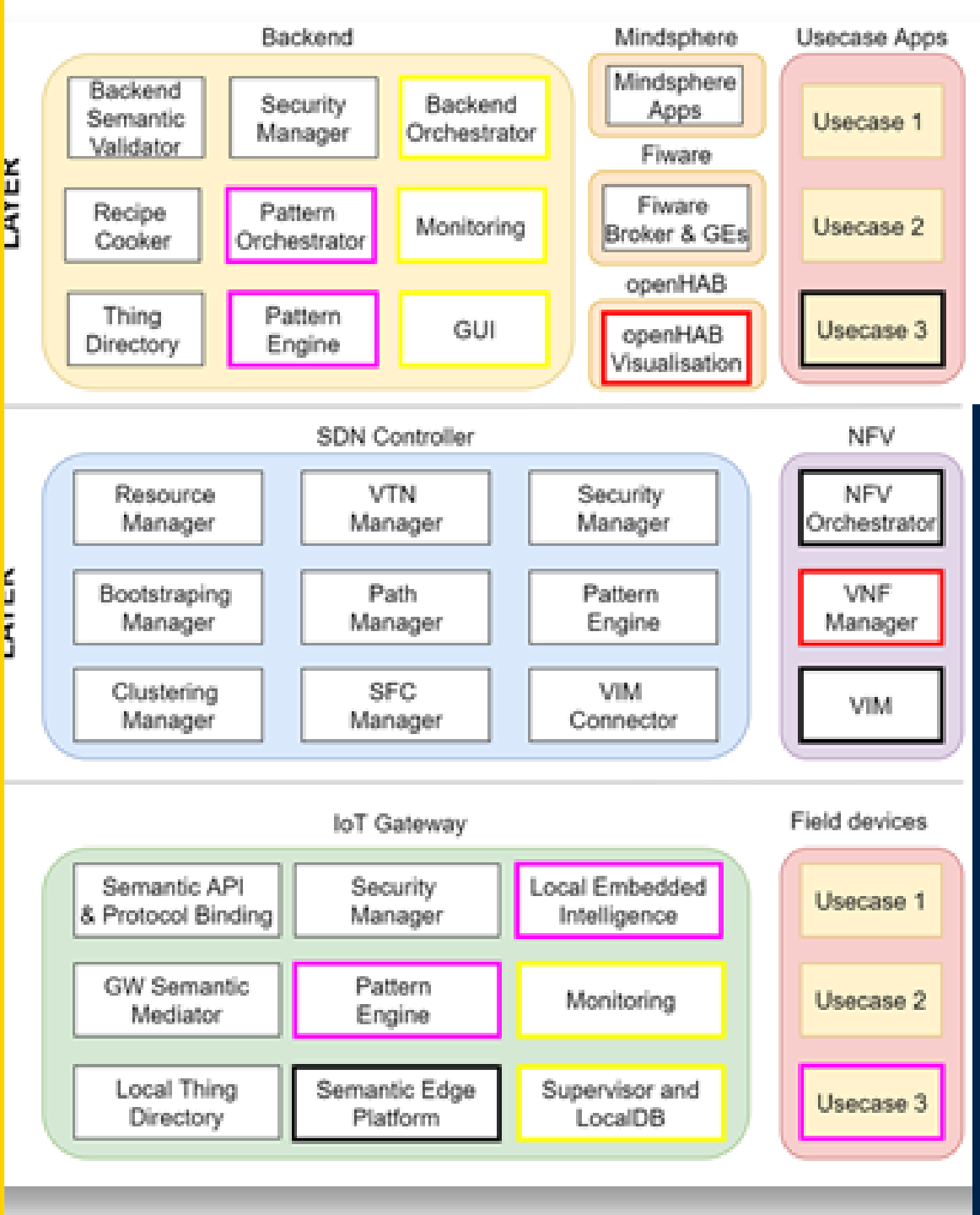
Enabling Ultra-low Power Machine Learning at the Edge

tinyML EMEA Technical Forum 2021 Proceedings

June 7 – 10, 2021

Virtual Event

www.tinyML.org



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AI Sensing Platform for early earthquake detection

Danilo PAU

Technical Director, IEEE and ST Fellow

STMicroelectronics Italia

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Enabling ultra-low Power Machine Learning at the Edge

IoT Seen as Prelude to ‘Sensor Swarm’

Sensors will be "immersed in the environment,“ Prof Alberto Sangiovanni-Vincentelli

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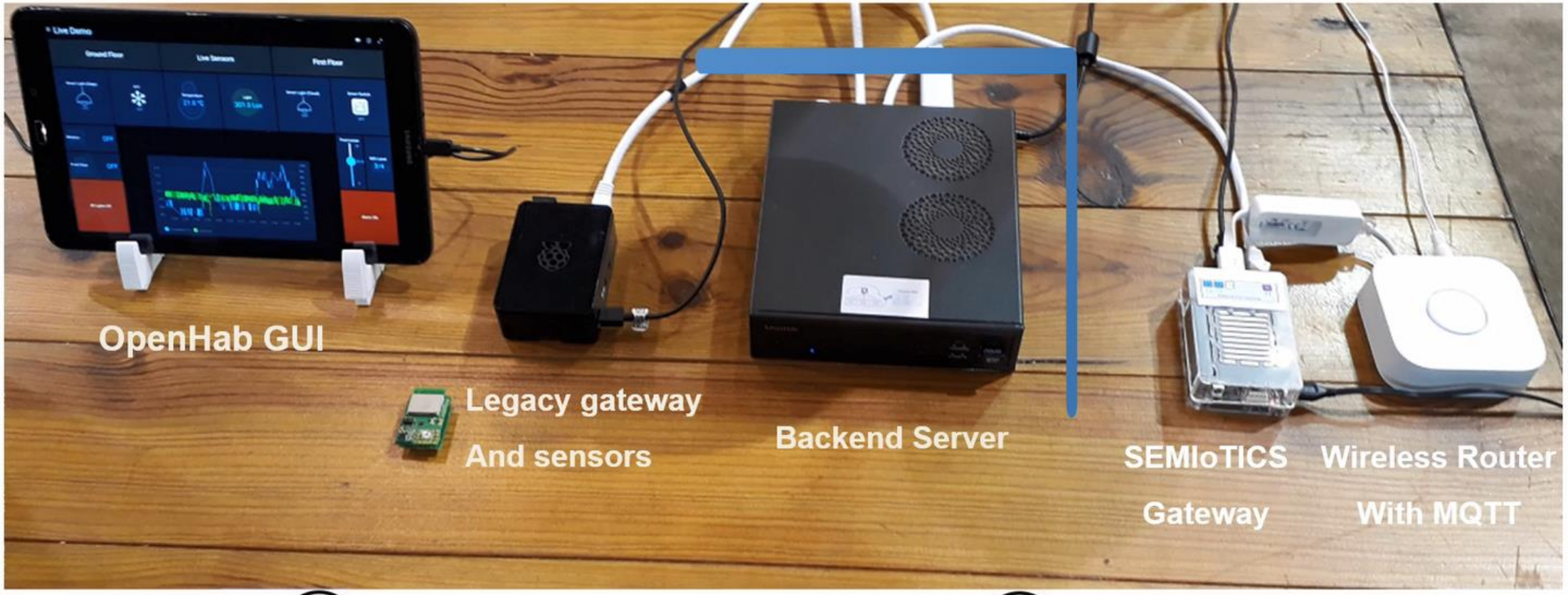
SEMIoTICS

UC3 Generic IoT
Intelligent Heterogeneous Embedded System for future IoT systems(IHES)

UC3 Physical Testbed



IHES Acceleration Sensing

IHES Environmental sensing

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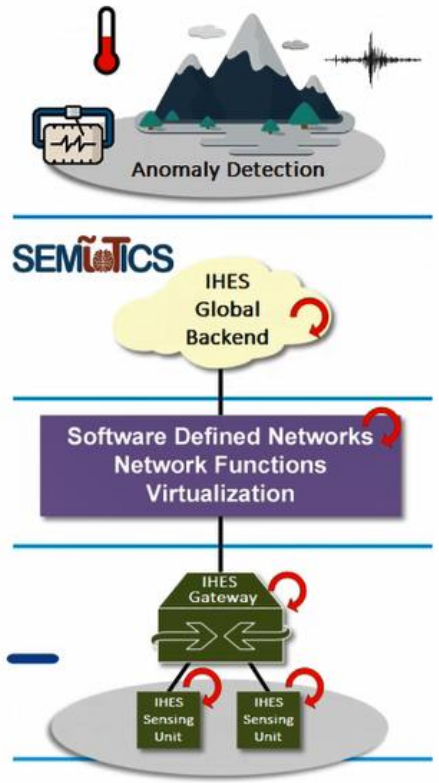
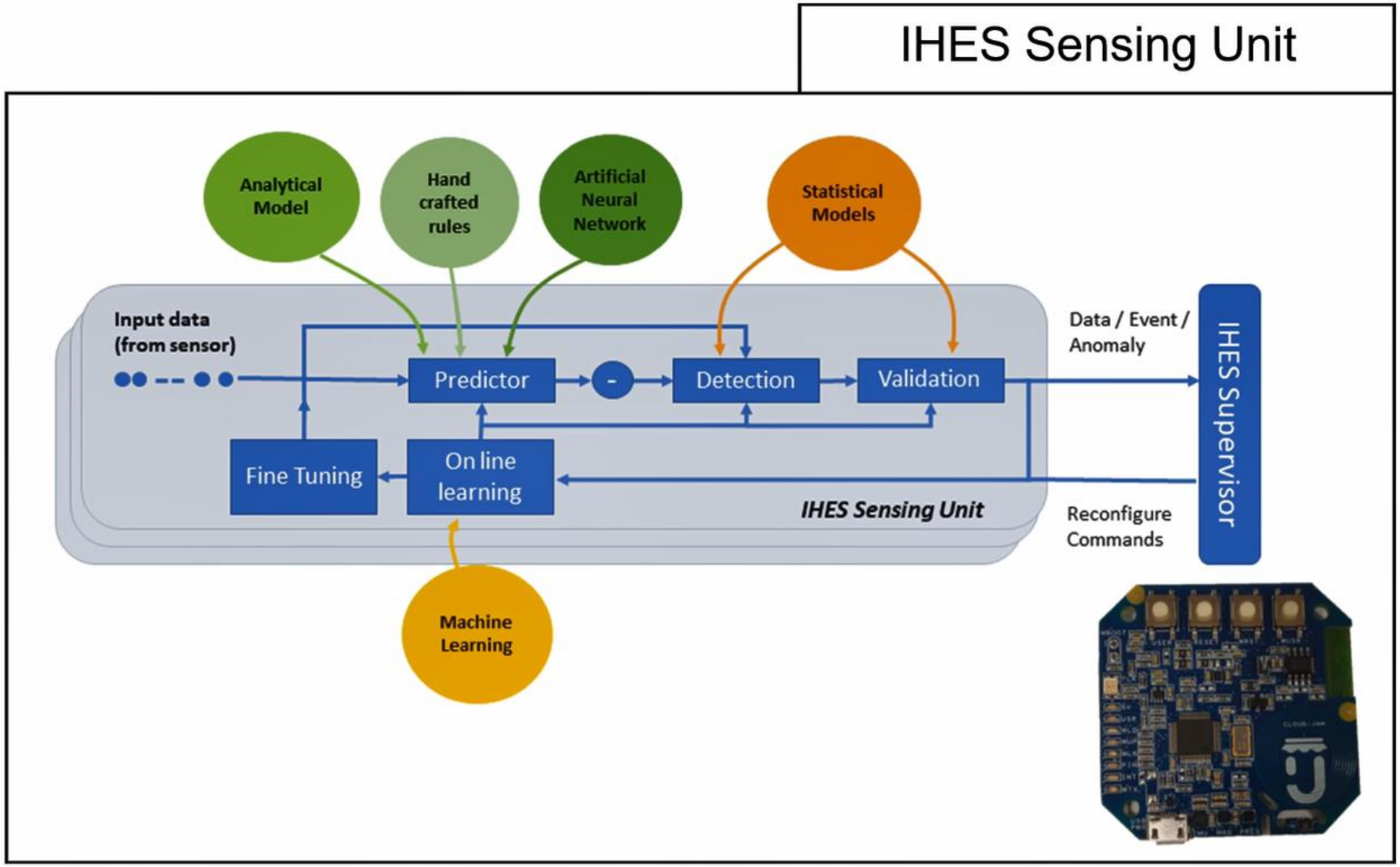
Sub Use Case 1 – Local Embedded Analytics





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Node-1	Node-2	Node-3	Node-11	Node-12	Node-13
Acceleration X 47.0	Acceleration X 78.0	Acceleration X 90.0	Temperature 32	Temperature 33.5	Temperature 33.3
Acceleration Y -38.0	Acceleration Y -93.0	Acceleration Y -26.0	Pressure 1020	Pressure 1021	Pressure 1019
Acceleration Z 991.0	Acceleration Z 1014.0	Acceleration Z 952.0	Humidity 46.3 %	Humidity 40.9 %	Humidity 42.2 %
Node1 State online	Node2 State online	Node3 State online	Node11 State partial	Node12 State local	Node13 State online

partial

Thank you

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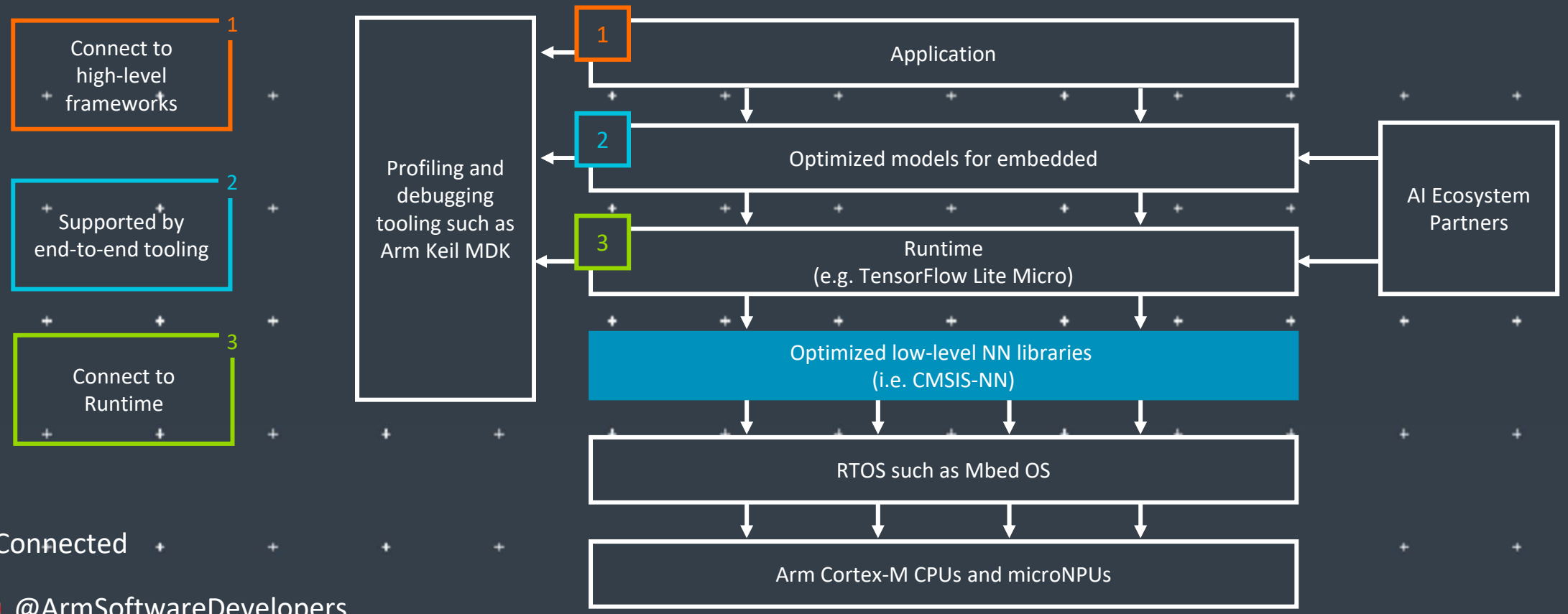
Arm: The Software and Hardware Foundation for tinyML



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@ArmSoftwareDevelopers

@ArmSoftwareDev

Resources: developer.arm.com/solutions/machine-learning-on-arm

arm

TinyML for all developers

C++ library

Arduino library

WebAssembly

Dataset

Acquire valuable training data securely

Enrich data and train ML algorithms

Edge Device

Real sensors in real time

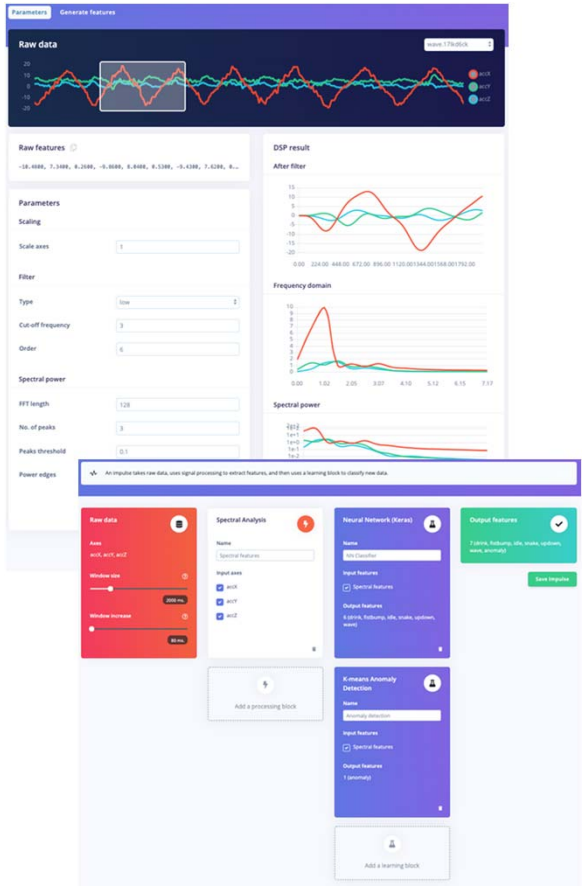
Open source SDK

Impulse

Embedded and edge compute deployment options

Test impulse with real-time device data flows

Test



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Perception

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Reasoning

Scene understanding, language understanding, behavior prediction

Action

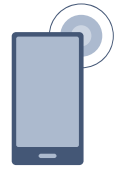
Reinforcement learning for decision making

Edge cloud

Cloud

IoT/IIoT

Automotive



Mobile

SYNTIANT

Syntiant Corp. is moving artificial intelligence and machine learning from the cloud to edge devices. Syntiant's chip solutions merge deep learning with semiconductor design to produce ultra-low-power, high performance, deep neural network processors. These network processors enable always-on applications in battery-powered devices, such as smartphones, smart speakers, earbuds, hearing aids, and laptops. Syntiant's Neural Decision Processors™ offer wake word, command word, and event detection in a chip for always-on voice and sensor applications.

Founded in 2017 and headquartered in Irvine, California, the company is backed by Amazon, Applied Materials, Atlantic Bridge Capital, Bosch, Intel Capital, Microsoft, Motorola, and others. Syntiant was recently named a CES® 2021 Best of Innovation Awards Honoree, shipped over 10M units worldwide, and unveiled the NDP120 part of the NDP10x family of inference engines for low-power applications.

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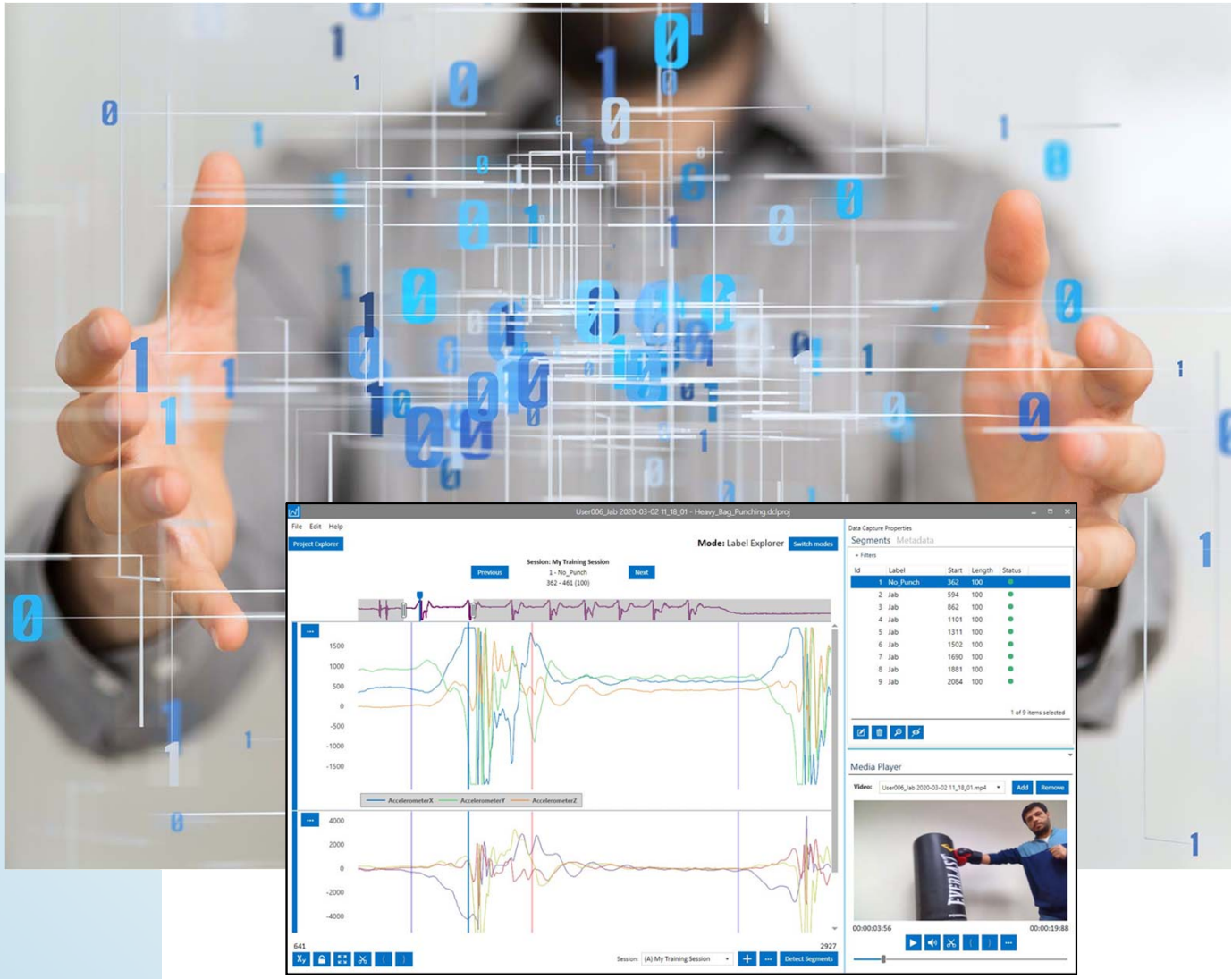

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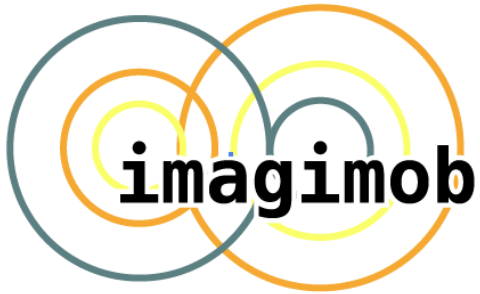

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