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

tinyML EMEA Technical Forum 2021
June 7-10, 2021

Utilizing Static Code Generation in TinyML

Presented by: Rafael Stahl, Technical University of Munich, Germany

June 10, 2021

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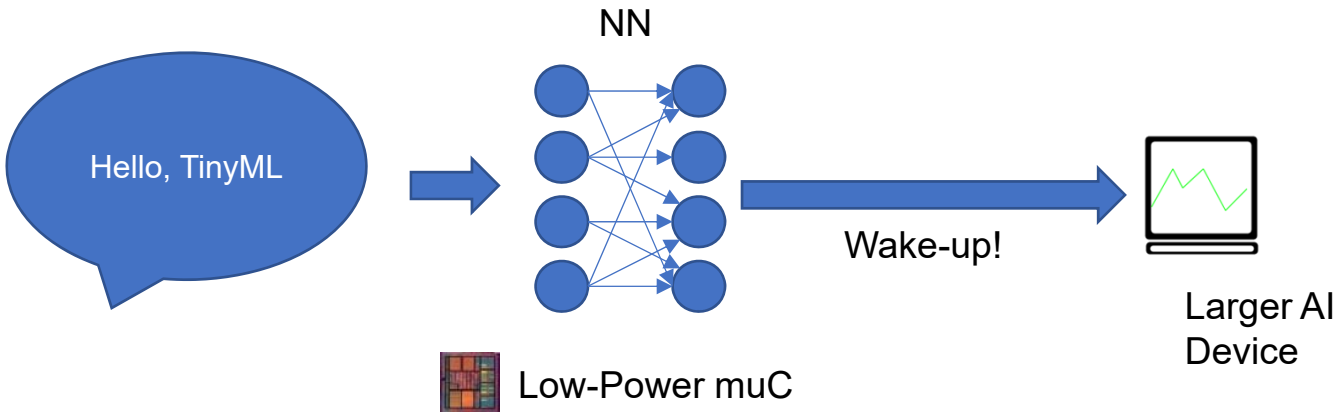
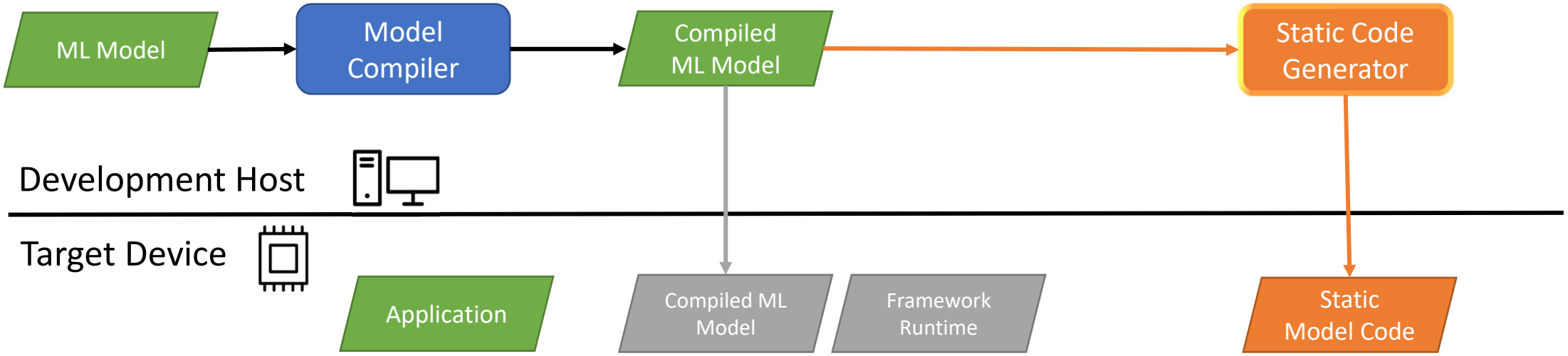
- Machine Learning on Microcontrollers enables advanced, low power applications
- Constrained in terms of run time and memory usage
- Targeting overheads in TFLite Micro and µTVM



- Runtime library on target → Generate static code
- Dynamic loading of graph and data → Only code and data for one particular model



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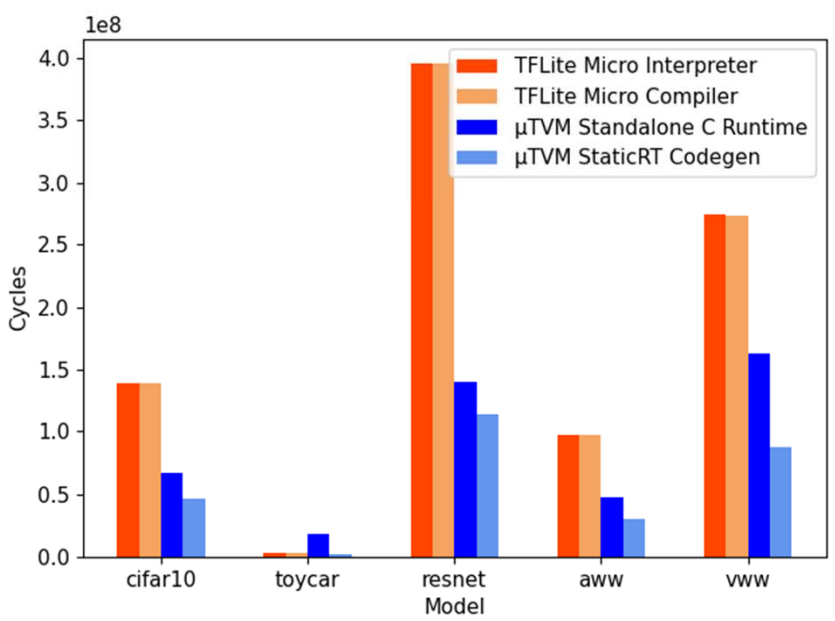
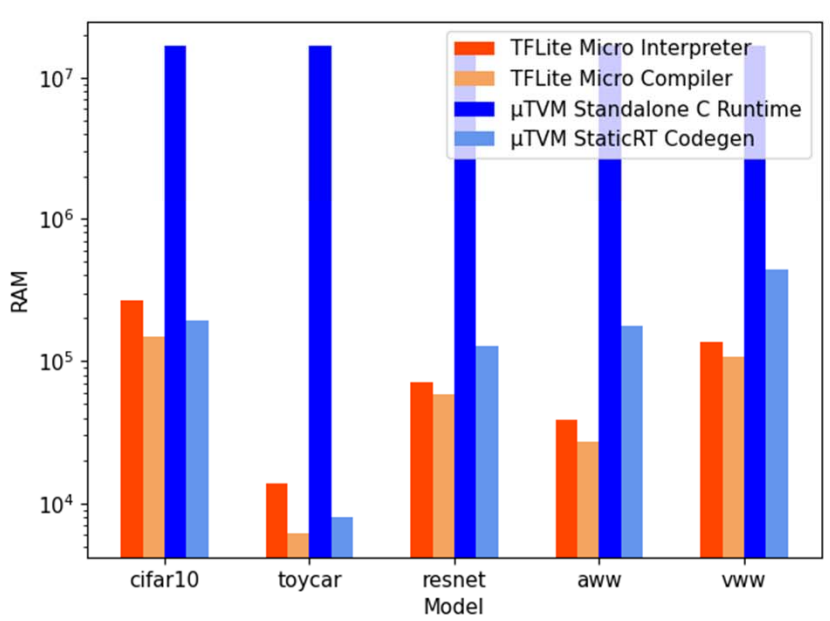
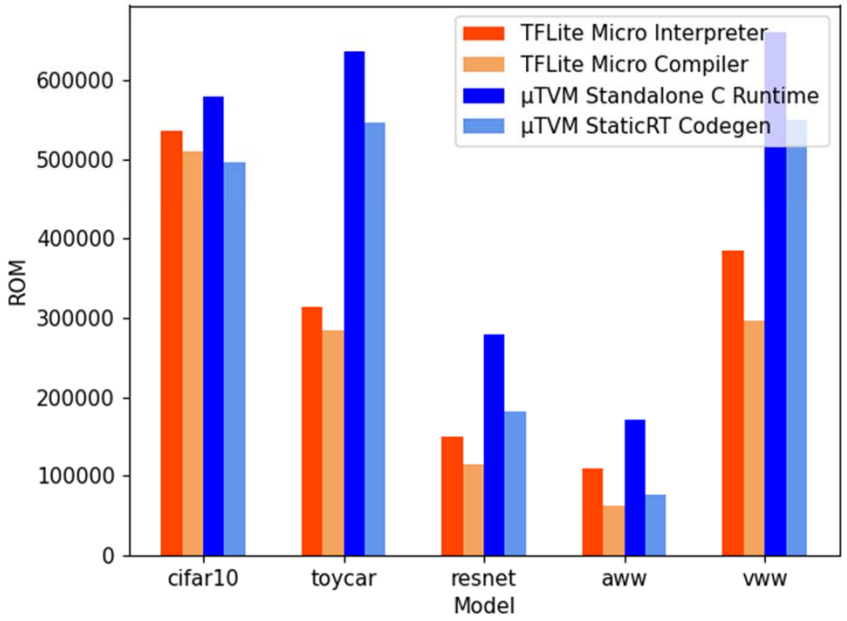
- Evaluated using TinyMLPerf
- RISC-V on ETISS

TFLite Micro: https://github.com/tum-ei-eda/tflite_micro_compiler
µTVM: https://github.com/tum-ei-eda/utvm_staticrt_codegen







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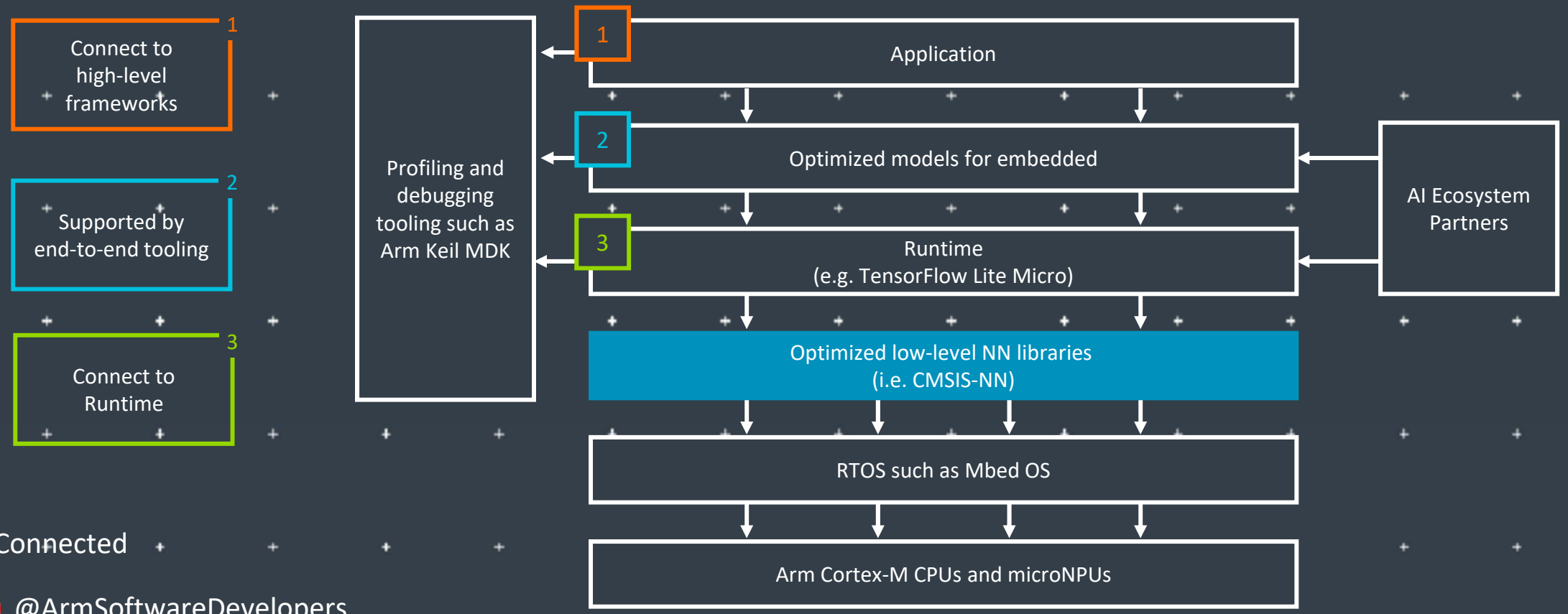

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Resources: developer.arm.com/solutions/machine-learning-on-arm

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

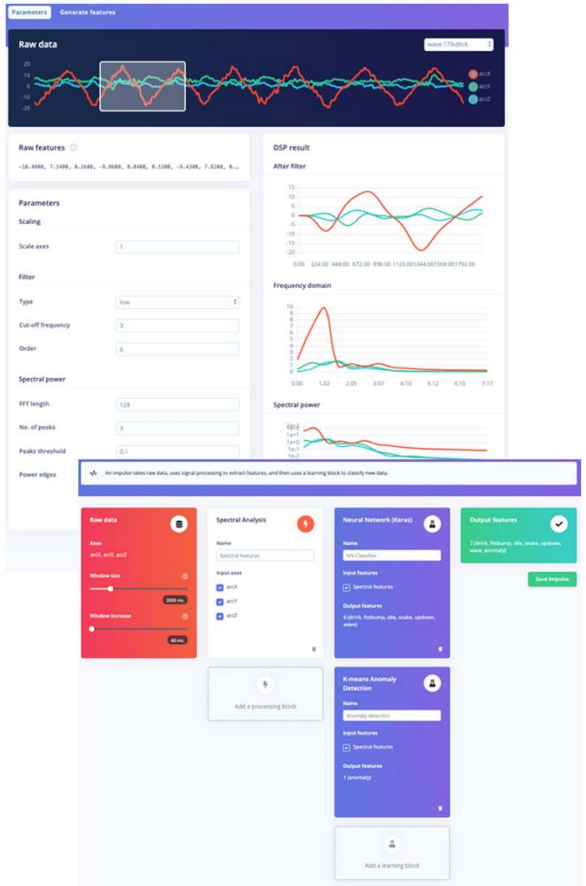
Open source SDK

Impulse

Embedded and edge compute deployment options

Test impulse with real-time device data flows

Test



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Edge cloud

Cloud

IoT/IIoT

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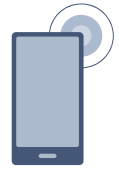

Mobile

SYNTIANT

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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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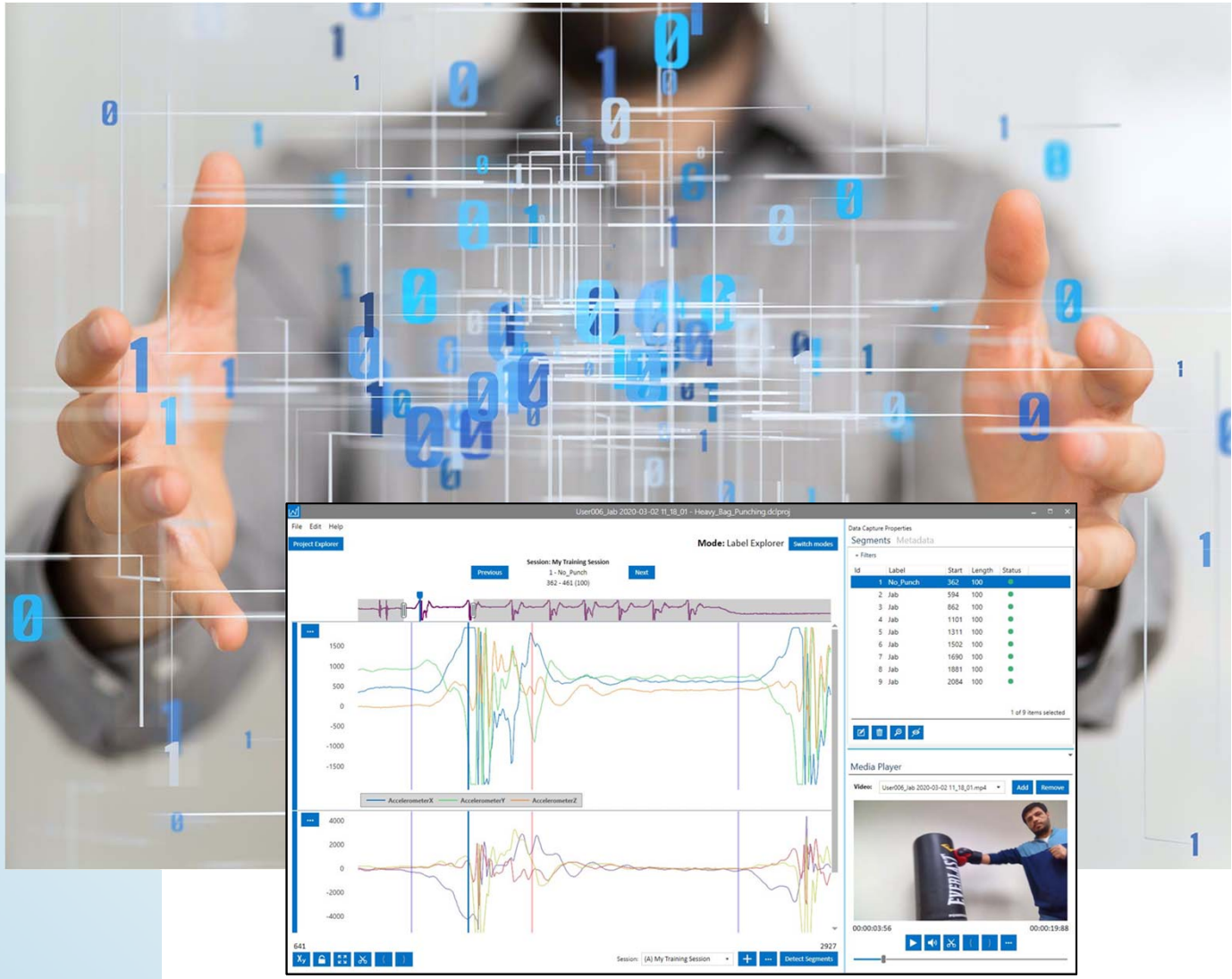

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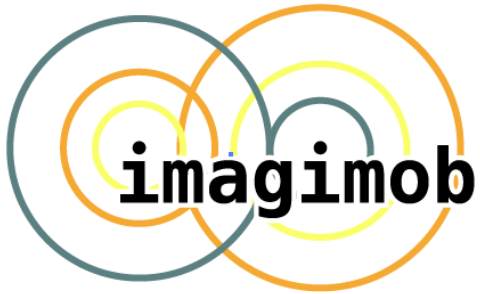

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