tinymLl Success Stories
with Mouna Elkhatib
CEO, CTO, and Co-Founder, AONDevices Inc.

INSPIRE-EDUCATE-ILLUMINATE
Thank you, tinyML Strategic Partners*, for committing to take tinyML to the next Level, together

* as of March 28, 2022; several more under final reviews
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- **Personalization**
  - Continuous learning, contextual, always-on, privacy-preserved, distributed learning

- **Efficient learning**
  - Robust learning through minimal data, unsupervised learning, on-device learning

- **Perception**
  - Object detection, speech recognition, contextual fusion

- **Reasoning**
  - Scene understanding, language understanding, behavior prediction

- **Action**
  - Reinforcement learning for decision making

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Qualcomm AI Research is an initiative of Qualcomm Technologies, Inc.
SYNTIANT

Neural Decision Processors
- At-Memory Compute
- Sustained High MAC Utilization
- Native Neural Network Processing

ML Training Pipeline
- Enables Production Quality Deep Learning Deployments

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- Reduces Data Collection Time and Cost
- Increases Model Performance

End-to-End Deep Learning Solutions for TinyML & Edge AI

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BECOME BETA USER bit.ly/testdeeplite
Add Advanced Sensing to your Product with Edge AI / TinyML

<table>
<thead>
<tr>
<th>Reality AI solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prebuilt sound recognition models for indoor and outdoor use cases</td>
</tr>
<tr>
<td>Solution for industrial anomaly detection</td>
</tr>
<tr>
<td>Pre-built automotive solution that lets cars “see with sound”</td>
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</tbody>
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<table>
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<tr>
<th>Reality AI Tools® software</th>
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<tr>
<td>Build prototypes, then turn them into real products</td>
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<td>Explain ML models and relate the function to the physics</td>
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<tr>
<td>Optimize the hardware, including sensor selection and placement</td>
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# BROAD AND SCALABLE EDGE COMPUTING PORTFOLIO

## Microcontrollers & Microprocessors

### Arm® Core
- **Arm® Cortex®-M 32-bit MCUs**
  - Arm ecosystem, Advanced security, Intelligent IoT
- **Arm®-based High-end 32 & 64-bit MPUs**
  - High-resolution HMI, Industrial network & real-time control
- **Arm® Cortex®-M0+ Ultra-low Power 32-bit MCUs**
  - Innovative process tech (SOTB), Energy harvesting

### Renesas Core
- **Ultra-low Energy 8 & 16-bit MCUs**
  - Bluetooth® Low Energy, SubGHz, LoRa®-based Solutions
- **High Power Efficiently 32-bit MCUs**
  - Motor control, Capacitive touch, Functional safety, GUI
- **40nm/28nm process Automotive 32-bit MCUs**
  - Rich functional safety and embedded security features

### Renesas Synergy™
- Arm®-based 32-bit MCUs for Qualified Platform
- Qualified software and tools

## Core technologies

### AI
- A broad set of high-power and energy-efficient embedded processors

### Security & Safety
- Comprehensive technology and support that meet the industry’s stringent standards

### Digital & Analog & Power Solution
- Winning Combinations that combine our complementary product portfolios

### Cloud Native
- Cross-platforms working with partners in different verticals and organizations

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The new MAX78000 implements AI inferences at low energy levels, enabling complex audio and video inferencing to run on small batteries. Now the edge can see and hear like never before.

[www.maximintegrated.com/MAX78000](http://www.maximintegrated.com/MAX78000)

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[www.maximintegrated.com/microcontrollers](http://www.maximintegrated.com/microcontrollers)

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[www.maximintegrated.com/sensors](http://www.maximintegrated.com/sensors)
Deploy TinyML into the Real World - Plug and Play ML

Sensors:
- modulated and ready-to-use sensors to simplify the setup process
- support 500+ grove modules

Wio Terminal:
- completed AI platform integrated with a 2.4" LCD Screen, onboard IMU (LIS3DHTR), microphone, buzzer, microSD card slot, light sensor, infrared emitter (IR 940nm)

Codecraft:
- no code Programming platform to Get Started With TinML
- supports Arduino, Python, C or JavaScript etc.

Edge Impulse:
- to optimize data utilization and enable deploy a machine learning model faster than ever

TensorFlow Lite:
- to easily train low memory usage machine learning models

Applications

Motion / Gesture / Speech / Smell / Sports
Barcode / Face / Image

Sense  Train  Inference

Artificial Nose
AI Thermal Camera for Safe Camping
Azure IoT Squirrel Feeder
Build Smart IoT Sensor Devices From Data

SensiML pioneered TinyML software tools that auto generate AI code for the intelligent edge.

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sensiml.com
SynSense builds sensing and inference hardware for ultra-low-power (sub-mW) embedded, mobile and edge devices. We design systems for real-time always-on smart sensing, for audio, vision, IMUs, bio-signals and more.

https://SynSense.ai
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October 10-12, 2022

https://www.tinyml.org/event/emea-2022

Event will be held in person in Cyprus.

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8 AM Pacific

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- tinyml.org/forums
- youtube.com/tinyml
Chris Rowen

Chris is a Silicon Valley entrepreneur and technologist, now VP of AI Engineering and Product for Webex Collaboration in Cisco. Most recently he was co-founder and CEO of BabbleLabs, a speech ML company, acquired by Cisco in 2020. Prior to Babblelabs, Chris served as CTO for Cadence’s IP Group, which he joined after Cadence’s acquisition of Tensilica, the company he founded in 1997 to develop extensible processors. He led Tensilica as CEO and later, CTO, to develop one of the most prolific embedded processor architectures, especially for compute-intensive embedded processing. Chris was a pioneer in developing RISC architecture and helped found MIPS Computer Systems in 1984. He has an MS and PhD in EE from Stanford and a BA in physics from Harvard. He was named an IEEE Fellow in 2015 for his work in development of microprocessor technology.
Mouna Elkhatib, CEO, CTO, and Co-Founder of AONDevices, Inc, a leader in edge AI for speech, sound, and sensor fusion. Mouna managed the formation of AONDevices, growing the team locally and internationally. An industry expert in voice and audio processing, she architected and led the development of the AONDevices product line and won multiple agreements with tier 1 semiconductor companies. Prior to AONDevices, Mouna architected and led the development of industry leading voice and audio semiconductor solutions for smartphones, PCs, smart speakers, and Internet of Things (IoT) at Qualcomm and Conexant. Mouna is an active member of a number of industry organization, serves on the Global Semiconductor Alliance Women’s Leadership Council, runs the WLI Entrepreneurial Committee, and contributes to the advancement of Edge AI. She holds an engineering degree from Ecole Nationale Supérieure d’Electricité et de Mécanique (ENSEM), eleven US patents and eleven pending patents.
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