

tinyML® Builds

Ultra-low power machine learning at the edge success stories

Lars Oleson – CEO and Co-Founder, Xailient
Andy Atkinson – VP of Engineering, Xailient

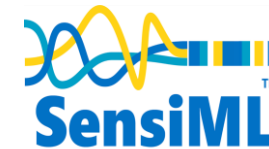
May 18, 2023



www.tinyML.org



Thank you, **tinyML Strategic Partners**,
for committing to take tinyML to the next Level, together





Executive Strategic Partners



The Leading Development Platform for Edge ML

edgeimpulse.com

Qualcomm
AI research

Advancing AI research to make efficient AI ubiquitous

Power efficiency

Model design, compression, quantization, algorithms, efficient hardware, software tool

Personalization

Continuous learning, contextual, always-on, privacy-preserved, distributed learning

Efficient learning

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

A platform to scale AI across the industry



Perception

Object detection, speech recognition, contextual fusion



Reasoning

Scene understanding, language understanding, behavior prediction



Action

Reinforcement learning for decision making



Edge cloud



Cloud



IoT/IIoT



Automotive



Mobile



Accelerate Your Edge Compute

SYNTIANT

Making Edge AI A Reality

www.syntiant.com



Platinum Strategic Partners

Renesas is enabling the next generation of AI-powered solutions that will revolutionize every industry sector.



[renesas.com](https://www.renesas.com)



**DEPLOY VISION AI
AT THE EDGE AT SCALE**

SONY



Gold Strategic Partners



AHEAD OF WHAT'S POSSIBLE™



AHEAD OF WHAT'S POSSIBLE™

Where what if
becomes what is.

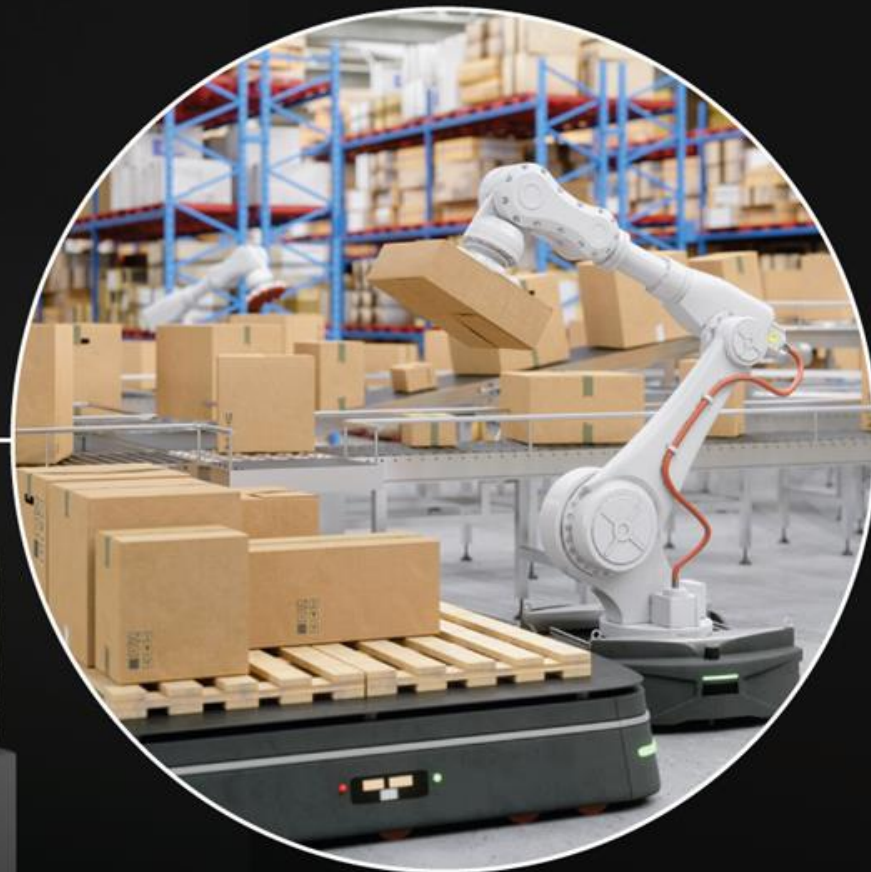
Witness potential made possible at analog.com.



PRO™

Easily deploy your
tinyML solutions with
Arduino Pro

arduino.cc/pro



Made In Italy

arm AI



Powering tinyML Innovation

Arm AI Virtual Tech Talks

The latest in AI trends, technologies & best practices from Arm and our Ecosystem Partners.

Demos, code examples, workshops, panel sessions and much more!

Fortnightly Tuesday @ 4pm GMT/8am PT

Find out more:

www.arm.com/techtalks

Decarbonization

Digitalization



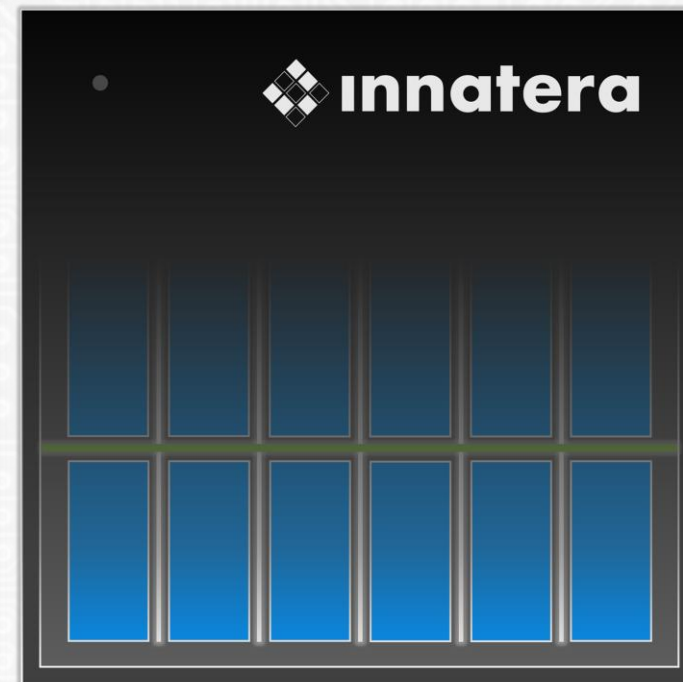
Driving decarbonization and digitalization. Together.

Infineon serving all target markets as
Leader in Power Systems and IoT

www.infineon.com



NEUROMORPHIC INTELLIGENCE FOR THE SENSOR-EDGE





Microsoft

The Right Edge AI Tools Can Make or Break Your Next Smart IoT Product



Analytics Toolkit Suite



sensiml.com/tinyML





life.augmented

STMicroelectronics provides extensive solutions to make tiny Machine Learning easy



ENGINEERING EXCEPTIONAL EXPERIENCES

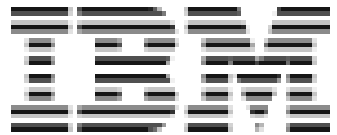
We engineer exceptional experiences for consumers in the home, at work, in the car, or on the go.

www.synaptics.com





Silver Strategic Partners





Join Growing tinyML Communities:



14.5k members in
47 Groups in 39 Countries

tinyML - Enabling ultra-low Power ML at the Edge

<https://www.meetup.com/tinyML-Enabling-ultra-low-Power-ML-at-the-Edge/>



4k members
&
11.6k followers

The tinyML Community

<https://www.linkedin.com/groups/13694488/>





Subscribe to
tinyML YouTube Channel
for updates and notifications
(including this video)

www.youtube.com/tinyML



tinyML
4.33K subscribers

9.4k subscribers, 565 videos with 328k views

HOME VIDEOS PLAYLISTS COMMUNITY CHANNELS ABOUT

13:24	33:27	32:39	36:41	34:03	34:58
On Device Learning Forum - Professors...	On Device Learning - Manuel Roveri: Is on-...	On Device Learning Forum - Warren Gros...	On Device Learning Forum - Yiran Chen...	On Device Learning Forum - Hiroku...	On Device Learning Forum - Song Han: O...
106 views · 4 days ago	138 views · 4 days ago	54 views · 4 days ago	47 views · 4 days ago	132 views · 4 days ago	137 views · 4 days ago
1:13	1:07:43	53:41	45:46	51:01	1:03:24
tinyML Smart Weather Station Challenge - ...	tinyML Talks Singapore...	tinyML Talks Shenzhen: Data...	tinyML Talks Singapore...	tinyML Smart Weather Station with Syntiant...	tinyML Trailblazers August with Vijay...
122 views · 4 days ago	262 views · 2 weeks ago	511 views · 3 weeks ago	229 views · 3 weeks ago	265 views · 3 weeks ago	286 views · 1 month ago
58:50	34:36	55:01	59:51	59:48	58:09
tinyML Auto ML Tutorial with SensiML	tinyML Auto ML Tutorial with Qeexo	tinyML Talks Germany: Neural network...	tinyML Trailblazers with Yoram Zylberberg	tinyML Auto ML Tutorial with Nota AI	tinyML Auto ML Tutorial with Neuton
351 views · 1 month ago	462 views · 2 months ago	374 views · 2 months ago	133 views · 2 months ago	287 views · 2 months ago	336 views · 2 months ago
1:02:30	34:31	1:00:30	1:06:44	1:53:07	42:13
tinyML Challenge 2022: Smart weather...	tinyML Talks South Africa - What is...	tinyML Talks: The new Neuromorphic Anal...	tinyML Talks Shenzhen: 分享主题...	tinyML Auto ML Forum - Paneldiscussion	tinyML Auto ML Forum - Demos
378 views · 2 months ago	214 views · 2 months ago	448 views · 2 months ago	159 views · 2 months ago	190 views · 2 months ago	545 views · 2 months ago



tinyML EMEA Innovation Forum

June 26 -28, 2023

Amsterdam

EMEA 2023

<https://www.tinyml.org/event/emea-2023>

More sponsorships are available: sponsorships@tinyML.org

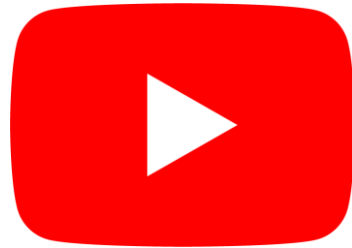


Reminders

Slides & Videos will be posted tomorrow



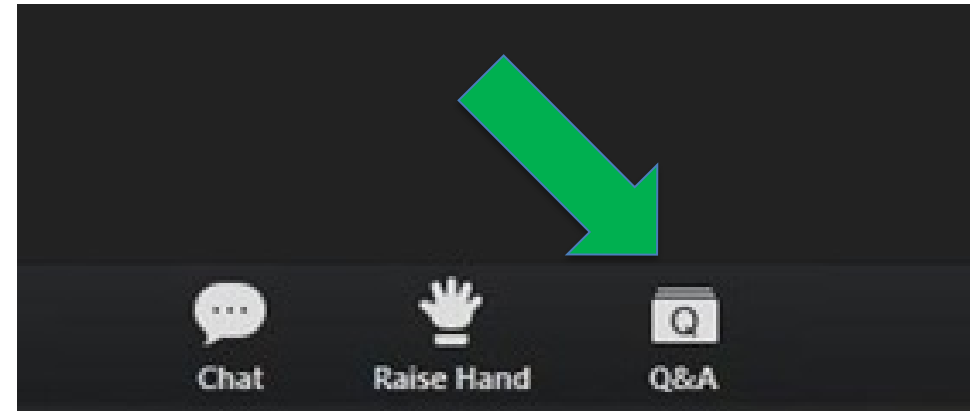
tinyml.org/forums



youtube.com/tinyml



Please use the Q&A window for your questions





Host of the Builds Series

Venkat Rangan



Venkat Rangan is a Maker and seasoned engineer with extensive experience in IoT system design and implementation. He is the founder of tinyVision.ai Inc., a hardware and system design consulting company. Venkat previously served as a Director of Engineering at Qualcomm Inc. Venkat holds a MSEE from the University of Cincinnati and a BTech from the Indian Institute of Technology, Roorkee. He is an inventor/co-inventor on over 40 issued patents.

Today's Guest

Lars Oleson



- Xailient CEO and co-founder
- 24 years in Enterprise Software
- Serial entrepreneur
- Experienced CEO with 100+ employees at exit
- Alipay, Symantec, Oracle
- MIT electrical engineering



Today's Guest

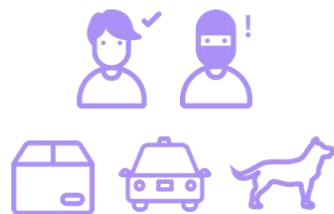
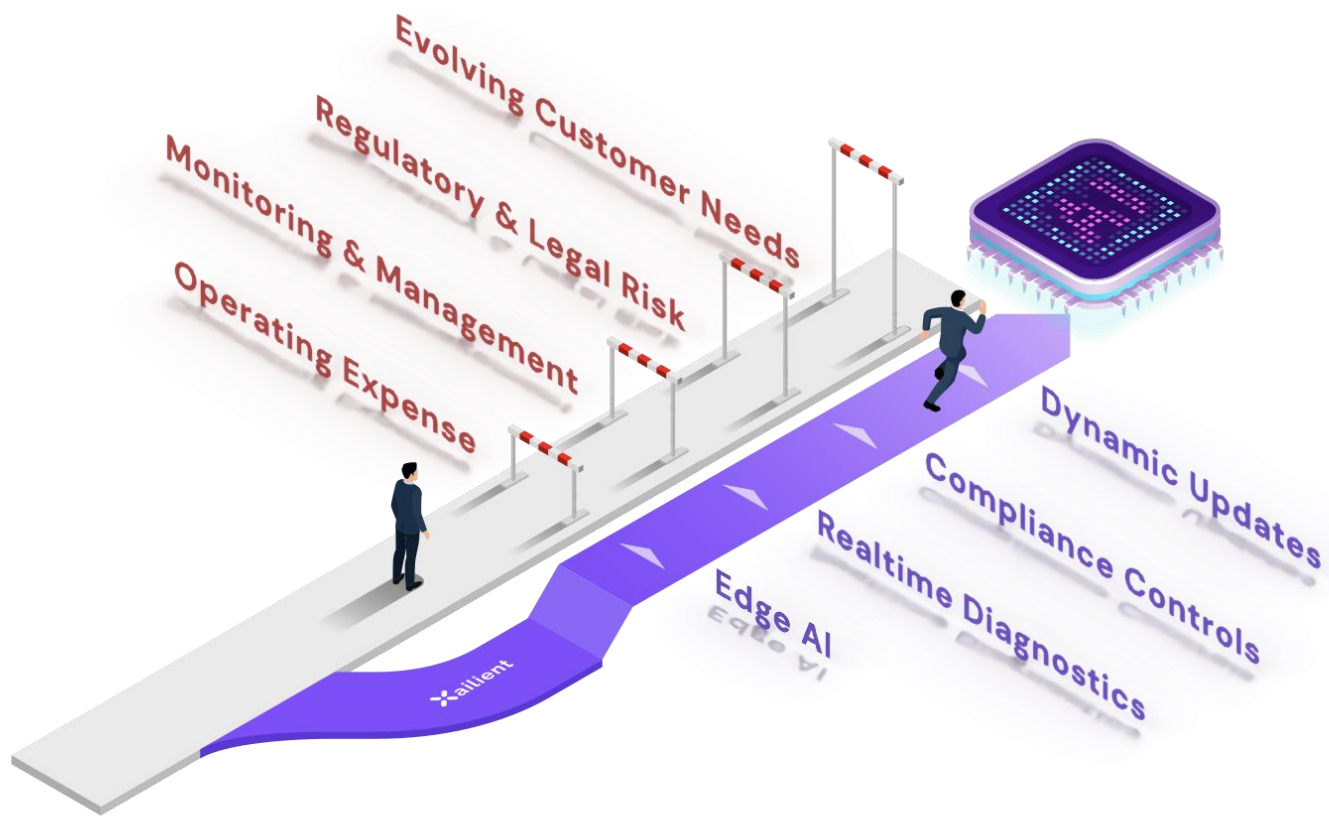
Andy Atkinson



- Xailient VP of Engineering
- 20+ years in high-tech, new product development
- 200+ projects from start-ups to multinational companies
- Loves the creative power that disruptive technology and high-quality engineering brings to the table.



GTM: Privacy-Compliant Computer Vision (CV)



Pre-Trained Edge AI
 Face Recognition (USP)
 Person, Vehicle, Package & Pet Detection
 License Plate Reading



Manageability at the Edge
 Performance monitoring, Audit, Update & Retrain



Compliance
 Privacy Policy enforcement and per-jurisdiction regulation updates

Hardware partners:

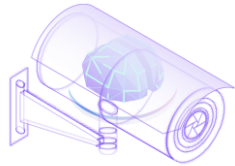


Xailient's Evolution



2020 (Aug)
Algorithmic leaders

Efficient Computer Vision...



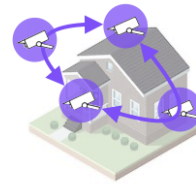
2021
Edge AI Experts

...where it matters...



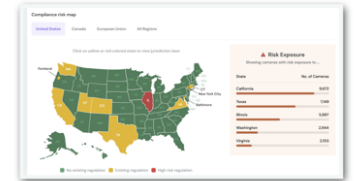
2022
CVOps System

...sustainably managed...



2022
**Video Doorbell &
 Smart Home**

*...for the first CV market
 to "break out"...*

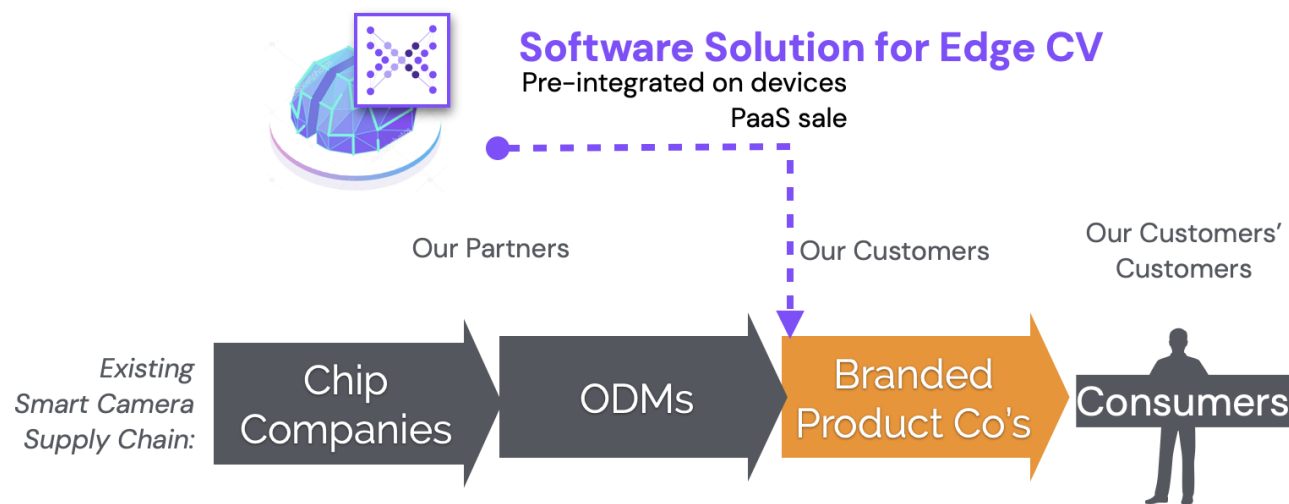


2023
Privacy Regulation Compliance

*... with regulatory-compliant
 data collection and biometrics.*



Ecosystem Fit



End-customers get the features they want.

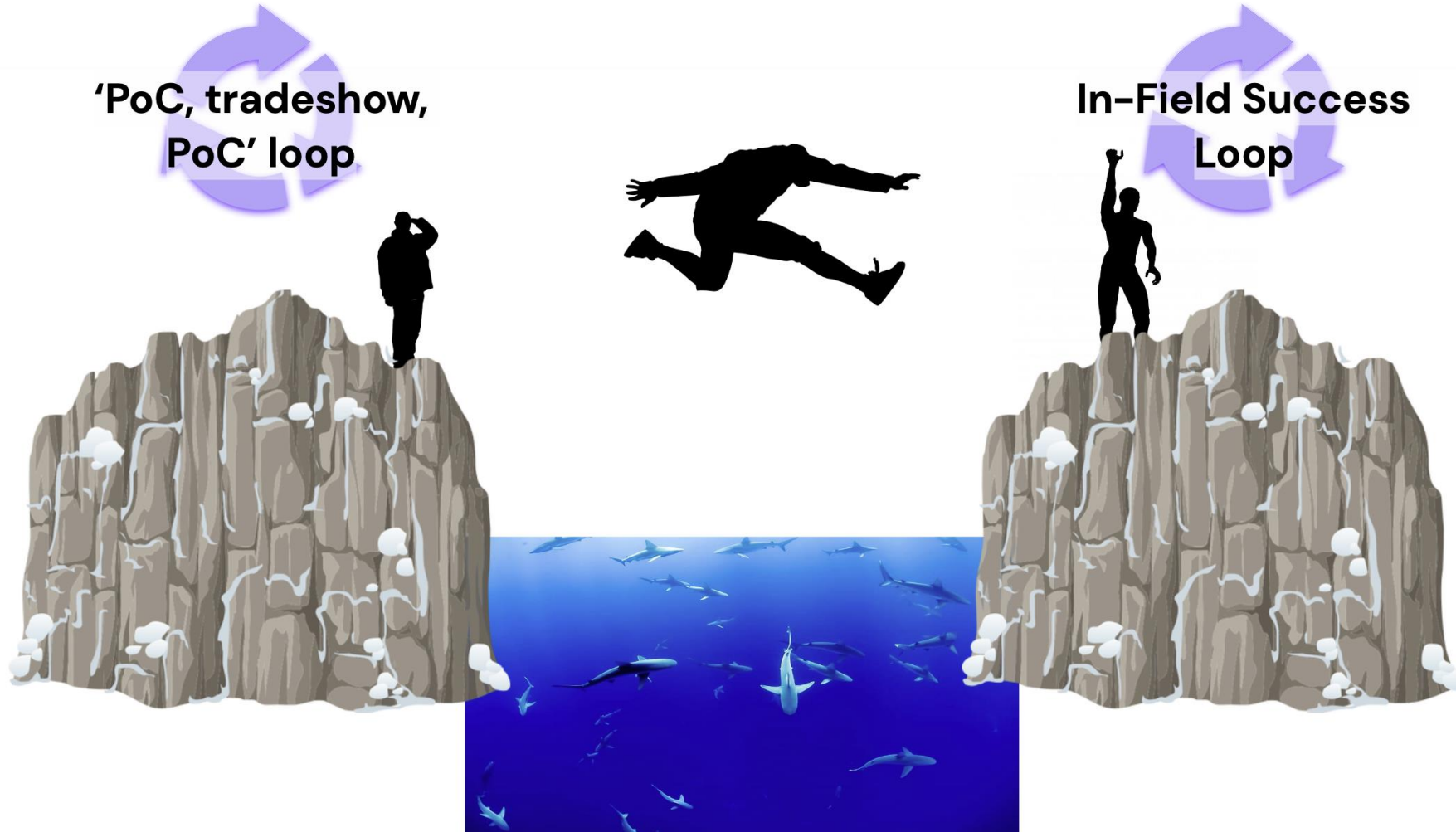
Our Customers get to market faster and with less risk.

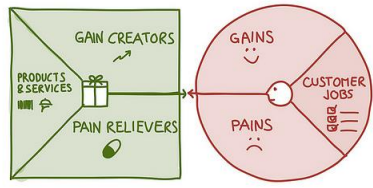
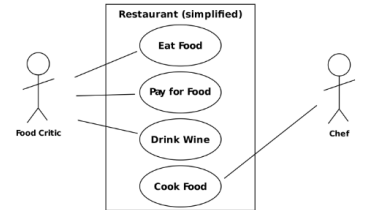

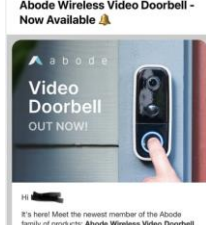
ODMs get a way to sustain and support devices in the field with advanced AI.

Chip companies get a scalable way to support their network of Branded Product & end-customers.



Crossing the chasm...



Crossing the Chasm with TinyML				
	Get real (about the Problem)	Get specific	Iteratively Build	Field it!
	W5H?	Use Cases & Specs	Targeted solution	Eval in Large & Diverse pops
HW	High- vol low- cost , parts, Engage suppliers!	RAM, Flash, TOPS, toolchain, eval kits...	test off- and on- target , product integration	Scale!
Models	Application needs HW constraints	model / pipeline architecture, OTS / custom, size, performance	HW- specific conversion	Measure & Update + In Field + At Scale
Data	Application needs	OTS, custom, both, 'the data project' begins..sourcing, management , tools, processes, training, testing	High- quality data only! + Use- case specific + Requirements coverage	collect field data, at- scale. Automated analytics for fleet- wide performance evaluation
Internal Humans (e.g. employees & process)	Right skillset & Values for each phase of work			
External Humans (e.g. customers, partners)	Viable economic alignment at the right scale and timeline for each key phase			



ORCHESTRAIT OPERATIONAL EDGE AI

KEY BENEFITS

STRATEGIC

Own Your AI Destiny

Orchestrait helps you collect, own, & improve your proprietary, ethical application dataset with full traceable consent

OPERATIONAL

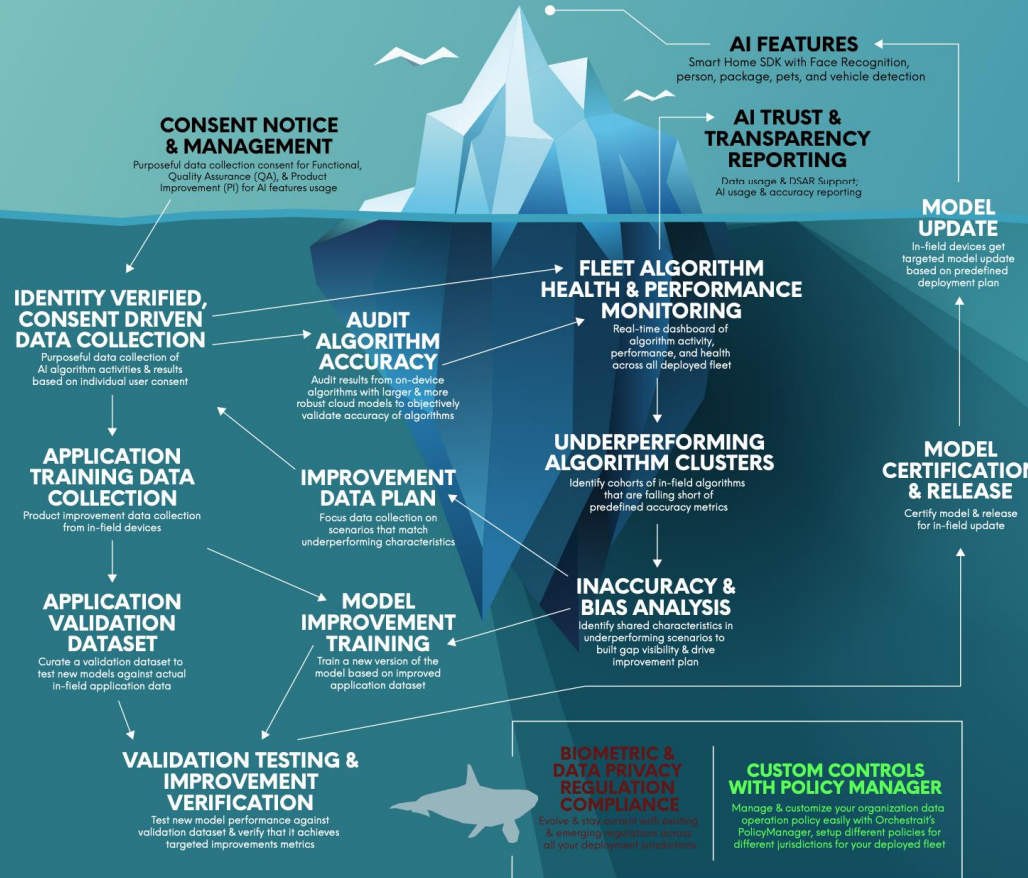
Real-time Instrumentation Full visibility of your fleet's algorithm performance & health in-field

Faster ROI Turnkey solution means less internal engineering effort and accelerated time to market

Reduce OPEX Edge AI significantly reduces cloud compute cost while improving customer experience

RISK MANAGEMENT

Mitigate regulatory risk by automating compliance to diverse data privacy regulations across deployed jurisdictions



<https://xaiient.com/tinyML>



In Summary:

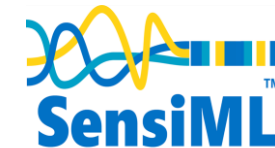
Sweat the details (especially with data!)

Focus on the product (commercial success over vanity benchmarks)

Build effective capability (people, processes, tools, behaviours)



Thank you, **tinyML Strategic Partners**,
for committing to take tinyML to the next Level, together





Copyright Notice

This multimedia file is copyright © 2023 by tinyML Foundation. All rights reserved. It may not be duplicated or distributed in any form without prior written approval.

tinyML[®] is a registered trademark of the tinyML Foundation.

www.tinyml.org



Copyright Notice

This presentation in this publication was presented as a tinyML® Talks webcast. The content reflects the opinion of the author(s) and their respective companies. The inclusion of presentations in this publication does not constitute an endorsement by tinyML Foundation or the sponsors.

There is no copyright protection claimed by this publication. However, each presentation is the work of the authors and their respective companies and may contain copyrighted material. As such, it is strongly encouraged that any use reflect proper acknowledgement to the appropriate source. Any questions regarding the use of any materials presented should be directed to the author(s) or their companies.

tinyML is a registered trademark of the tinyML Foundation.

www.tinyml.org