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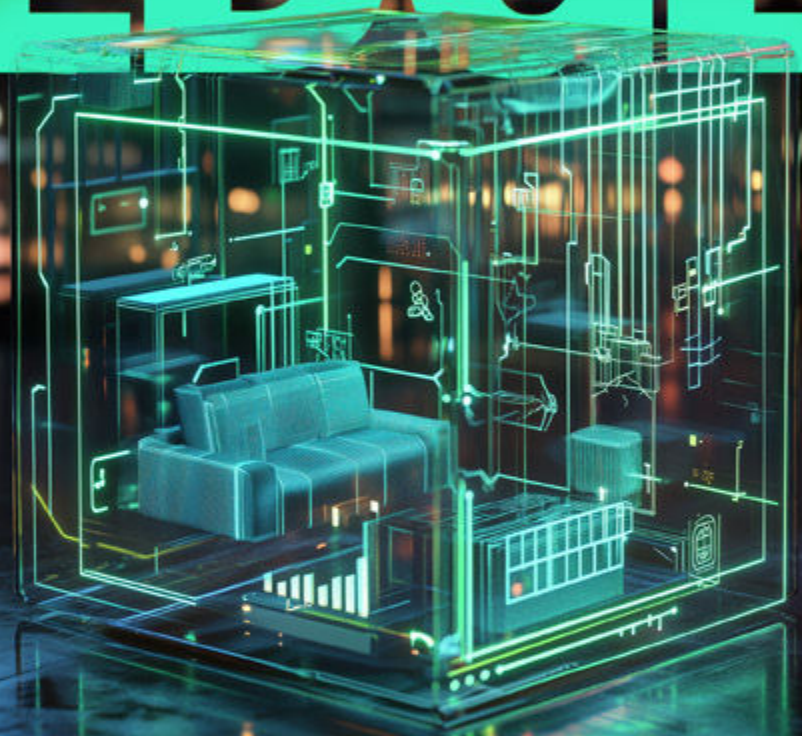
THE EDGE



THE NEWARK EDGE:
EMPOWERING YOUR AI JOURNEY

MARKET INSIGHT
LATEST PRODUCTS
EXPERT INTERVIEWS

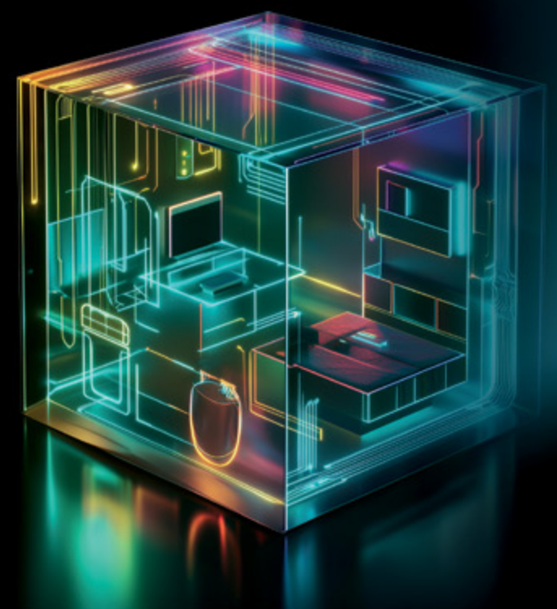
ENGINEERING OUTLOOK
THE EDGE RESOURCES
NEWARK UPDATES

ACCELERATE YOUR INNOVATION

THE EDGE

ACCELERATE YOUR INNOVATION

CONTENTS



THE NEWARK EDGE: EMPOWERING YOUR AI JOURNEY

In a defining moment for the electronics industry, the intelligence once confined to the cloud is rapidly migrating to the edge. Our latest Avnet Insights whitepaper, “Embracing AI,” confirms this tectonic shift, revealing that 42% of engineers are already shipping AI-enabled products. This is more than a trend, it’s a fundamental transformation that is making AI more accessible, power-efficient, and responsive than ever before.

CLIFF ORTMEYER

HEAD OF SOLUTIONS DEVELOPMENT, NEWARK

At Newark, an Avnet company, we are witnessing a new wave of innovation where the future is being built on-board. Edge AI empowers engineers to create systems that can sense, decide, and act in milliseconds, without the latency or security risks of cloud dependency. Whether it’s a motor controller predicting mechanical failure or a smart camera detecting anomalies or automated guided vehicle (AGV) in a factory, AI at the edge unlocks unprecedented applications. The elegance of these solutions lies in their ability to marry compute capability with low power and rugged design. All on a single, integrated device.

Our unique position in the technology value chain allows us to provide a seamless journey from prototype to production. We partner with the world’s most innovative suppliers, including AMD, ADI, STMicroelectronics, NXP, Microchip, Infineon, Renesas, Raspberry Pi and Arduino, to offer a comprehensive suite of solutions. This goes beyond the core processors and includes everything from reference designs and development kits that accelerate your initial prototyping, to single-board computers (SBCs) that bridge the gap to production. We also provide a full range of on-board components, including passives, connectors, sensors, and electromechanical parts, ensuring your entire Bill of Materials is sourced from one reliable partner.

Not only that, but our commitment to your success also extends beyond the components. We understand that your business needs a partner with the right resources and support, including tools for compliance and quality assurance. That’s why we offer leading Test & Measurement solutions from leading supplier, like Tektronix, Keysight, NI, Fluke and more, to help you validate your designs and ensure they meet all necessary compliance standards, getting your product to market faster. We provide the knowledge, resources, and technical support to help you master this new landscape. Through this edition of our THE EDGE magazine, technical articles, and webinars, we aim to accelerate your learning and empower you to turn AI dreams into real-world designs. Because at the edge of innovation, it’s not just about what AI can do - it’s about what you can do with AI.

THE EDGE: MARKET INSIGHTS

GLOBAL AI MARKET OVERVIEW

MARKETSIZE IN 2025: PROJECTED TO REACH
$244.22bn

CAGR 2025-2031: EXPECTED ANNUAL GROWTH RATE
26.6%

LARGEST MARKET IN 2025: UNITED STATES
$73.95bn

MARKET VOLUME IN 2031: ANTICIPATED REACH
$1.01tn

THE STATE OF AI IN ELECTRONICS

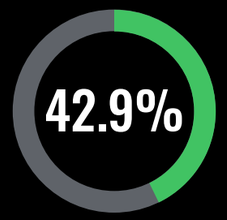
AI Moves from Cloud to Edge

AI adoption is no longer experimental it's becoming embedded across industries and devices. According to the latest Avnet Insights survey, 42% of engineers already have AI enabled products in market, while another 40% are actively integrating AI into upcoming designs.

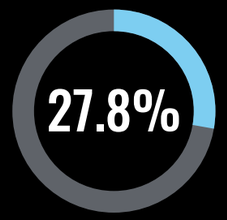
AI is now being applied in every stage of electronic design and in a wide variety of applications, from process automation and predictive maintenance to fault detection, biometrics, and augmented reality. Globally, China leads in AI enabled product deployment (66%), but adoption is accelerating across all regions.

WANT TO KNOW MORE?
Read our **Embracing AI** report in full here.

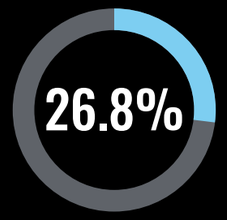
Top Applications Driving Adoption:



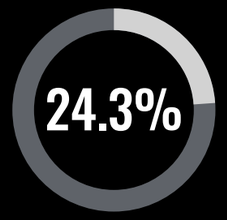
PROCESS AUTOMATION



PREDICTIVE MAINTENANCE



FAULT/ANOMALY DETECTION



BIOMETRICS

STRATEGIC FORESIGHT

2025 is shaping up to be a pivotal year where edge AI adoption accelerates. The movement toward **on-board intelligence** means electronic components **microcontrollers, sensors, interconnects, and power devices** must evolve to handle AI-driven workloads.

For engineers, the key takeaway is:

AI is now a core design parameter alongside performance, cost, and reliability. Success at the edge will be determined by choosing components that balance intelligence with efficiency.

CHALLENGES, TRENDS AND FUTURE OUTLOOK

Challenges Ahead

Despite its momentum, AI adoption isn't without obstacles. Engineers identified: Security & privacy, data quality, existing tool intergration and high cost barriers the biggest challenges when considering intergrating AI into their products.

Interestingly, power requirements did not rank as a top concern suggesting engineers are growing confident in managing performance power trade-offs in embedded edge systems.

SECURITY & PRIVACY 37%

DATA QUALITY 31%

EXISTING TOOL INTEGRATION 25%

HIGH COST BARRIERS 19%

Emerging AI Trends in Design

When asked which AI trends will have the biggest impact on product design, engineers' responses highlighted the broad pervasiveness of AI:

10% AUTONOMOUS DESIGN

9% EFFICIENCY-FOCUSED TOOLS

8% CODE GENERATION

8% REAL-TIME COLLABORATION

OF ENGINEERS BELIEVE AI WILL:

- SHORTEN PRODUCT DEVELOPMENT CYCLES
- IMPROVE PREDICTIVE DESIGN
- ENABLE GREATER CUSTOMISATION

"AI ISN'T JUST CHANGING WHAT ENGINEERS DESIGN, **BUT HOW THEY DESIGN.**"

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ARTIFICIAL INTELLIGENCE AT THE EDGE

The hub for Cutting-edge AI solutions

/IOTCONNECT™
powered by aws

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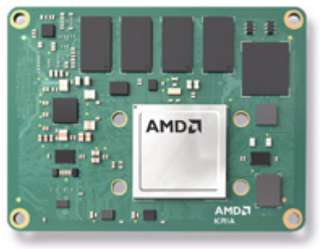
Edge AI with IoT Sensor to Cloud Platform

/IoTConnect™ your Sensor-to-Cloud Hub, is the fastest and most scalable way to securely connect products to the cloud. Built on AWS and Microsoft Azure, it provides a ready-to-use platform to accelerate IoT deployment without needing deep cloud expertise.

EMPOWERING ON-BOARD INTELLIGENCE

COMPLETE AI - SOLUTIONS

AMD

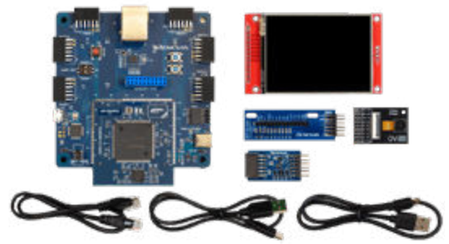


AI-Optimized SOM for Embedded Vision and Machine Analytics

AMD Kria K26 SOM

Designing AI vision systems for smart cities, factories, and automation requires performance and reliability. The Kria™ K26 SOM delivers both with hardware acceleration, flexible AI model integration, and production certification in a compact form factor. Engineers can skip complex FPGA design by using pre-built apps and native ROS 2, cutting dev cycles by up to 5×. With 3× vision AI performance and 2× performance-per-watt, it powers machine vision, object tracking, and analytics within tight power and thermal limits, available in commercial and industrial grades.

RENESAS



Accelerating AI at the Edge with Multi-Modal Reference Solutions

AIK series - RA6M3 & RA4E1

Designing AI-enabled systems for real-time analytics, vision, and audio doesn't need to start from scratch. The AIK Series Solution Kits, built on Renesas RA6M3 and RA4E1 MCUs, deliver ready-to-integrate AI/ML models in a scalable platform that minimizes memory demands while maximizing CPU performance. Each kit combines hardware accelerators, sensor fusion, vision support, and flexible connectivity. With pre-validated and Reality AI Tools® engineers can rapidly prototype for applications from logistics to smart infrastructure cutting design risk and accelerating time to market.

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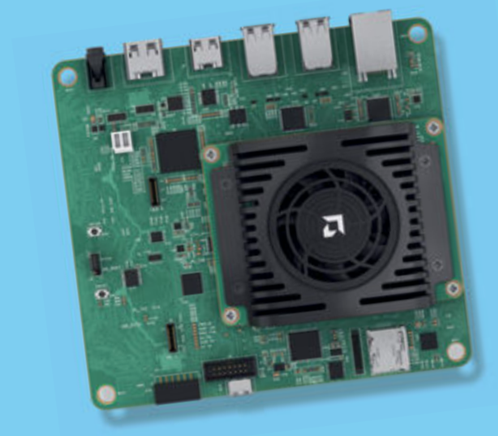
INDUSTRY

YOUR TRUSTED CHOICE FOR RELIABILITY AND QUALITY!

Panasonic supports your innovation with components and sensors, from basic needs to advanced, high-spec solutions.



AMD

Vision AI Starter Kit

Kria KV260 Vision AI Starter Kit

AI Starter Kit combines a Zynq™ UltraScale+™ MPSoC-based K26 SOM, carrier card, and thermal solution, enabling rapid prototyping, real-world AI model testing, and fast transition from prototype to production with full customization and connectivity support.

COMPLETE AI - SOLUTIONS

ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™

CNN-Enabled AI MCU Platform for Face Identification

MAX78000EVKIT

Running AI on small, battery-powered devices often means trading performance for power. The MAX78000 changes that equation. With its Arm Cortex-M4 core and integrated CNN accelerator, it delivers high-efficiency AI inference directly on the device, no cloud needed. The evaluation kit equips engineers with audio, vision, and sensor inputs, plus a fast deployment flow from PyTorch to hardware. From keyword recognition and face identification to health signal analytics and predictive maintenance, the MAX78000 provides a practical path to building smarter, longer-lasting edge AI systems.

NXP

EdgeReady MCU-Based Solution for 3D Face Recognition

SLN-VIZN3D-IOT

Smart access control and IoT devices demand high accuracy, privacy, and real-time response without relying on the cloud. NXP's EdgeReady SLN-VIZN3D-IOT solution, built on the i.MX RT117F crossover MCU, delivers fully offline 3D face recognition with advanced liveness detection. Using a structured light 3D camera and optional RGB sensor, the system resists spoofing attempts from photos or 3D models while operating reliably in challenging outdoor lighting. Integrated turnkey software enables out-of-the-box functionality, remote registration via mobile devices, and eliminates the need for costly, power-hungry Linux-based MPUs. This makes the SLN-VIZN3D-IOT a complete, low-latency, privacy-conscious platform for AI-driven edge security applications.

NXP

EdgeReady Smart HMI Solution

SLN-TLHMI-IOT - EdgeReady Smart HMI Solution

Build intelligent, multimodal interfaces with a single MCU, with dual-core i.MX RT117H, ML vision, far-field voice, and 2D graphics acceleration for rapid HMI development.

MICROCHIP

PolarFire FPGA Video and Imaging Kit

MPF300-VIDEO-KIT - PolarFire FPGA Video and Imaging Kit

300K-LE FPGA with dual cameras and versatile displays. Optimized LUT4, DDR4, and DSP blocks deliver low-latency AI inference for drones, robotics, and ADAS-fast, on-device decision-making.

RENESAS

Vision-AI accelerated development board

RZBoard V2L - Vision-AI accelerated development board

Power-efficient, vision-AI board with Renesas RZ/V2L processor. Compact Raspberry Pi form factor with HDMI, MIPI camera, and HAT/shield support for AI/ML projects.

Raspberry Pi

Raspberry Pi AI Kit

Raspberry Pi AI Kit adds Hailo-8L acceleration, delivering up to 13 TOPS. A compact, power-efficient way to bring high-performance AI to Raspberry Pi 5.

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From prototype to production,
we've got you covered.

LATEST ON-BOARD COMPONENTS

ANALOG DEVICES
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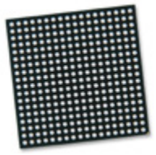


Microcontroller

MAX78002GXE+

AI microcontroller built for the edge. Runs neural networks at ultra-low power, combining efficient AI processing with ultra-low-power MCU technology.

RENESAS

Microcontroller

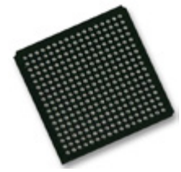
R7KA8P1KFLCAC#UC0

High-performance MCU with powerful CPU cores, large on-chip memory, external memory support, and rich peripherals, built to handle demanding AI and edge processing workloads.

Microcontroller

STM32N6

The first MCU with a built-in neural accelerator, purpose-built to run AI at the edge with extreme power efficiency. Unlock faster, smarter designs without offloading to the cloud.



Microcontroller

i.MX RT1170

Dual-core MCU with 1 GHz + 400 MHz performance, 2 MB RAM, rich connectivity (Ethernet TSN/AVB, USB, CAN FD), and built-in security. Backed by full SDK, IDEs, and rapid dev tools.

Accelerometer

LIS2DUX12

Ultra-low power 3-axis accelerometer with always-on filtering, FSM, and ML core with adaptive self-config. Built for smarter motion sensing without draining the battery.

IC Sensors

VL53L0CXV0DH/1

VL53L0X is a compact Time-of-Flight gesture detection sensor measuring distances up to 2m with high accuracy, immune to ambient light, ideal for object detection, automation, and smart devices.

LATEST ON-BOARD COMPONETS

Amphenol
COMMUNICATIONS SOLUTIONS

Connectors

PSAS5F3130081TR

SAS/PCIe 5.0 (U.2 & U.3) connectors comes with 32GT/s PCIe and 24Gb/s SAS for next-gen servers. 68-position connector handles both storage and PCIe devices with 500-cycle durability built for speed and reliability.

NORDIC SEMICONDUCTOR

Semiconductors - ICs

nRF54L15

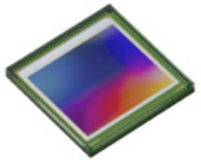
nRF54L15 SoC powers next-gen wireless with BLE, Mesh, Zigbee, Thread, Matter, Sidewalk, and 2.4 GHz. Pairs with nRF70 for Wi-Fi, making it a flexible choice for connected product design.

Imaging Devices/ Cameras

CAM-6GY-152VIS

CAM-66GY camera module packs the VD66GY 1.5MP sensor, lens, and flex connector into a 6.5mm module. Delivers fast evaluation with on-chip features like binning, autoexposure, and context management.

ams OSRAM



Imaging Devices/ Cameras

MIRA220-2QI1WA 500U FT SE

2.2MP NIR global shutter image sensor with 2.79µm pixels, 90fps, and MIPI CSI-2. Delivers sharp low-light imaging for AI-driven AR/VR, facial auth, drones, robotics, and smart vision systems.

Navitas

Power IC Drivers

NV6523-RA

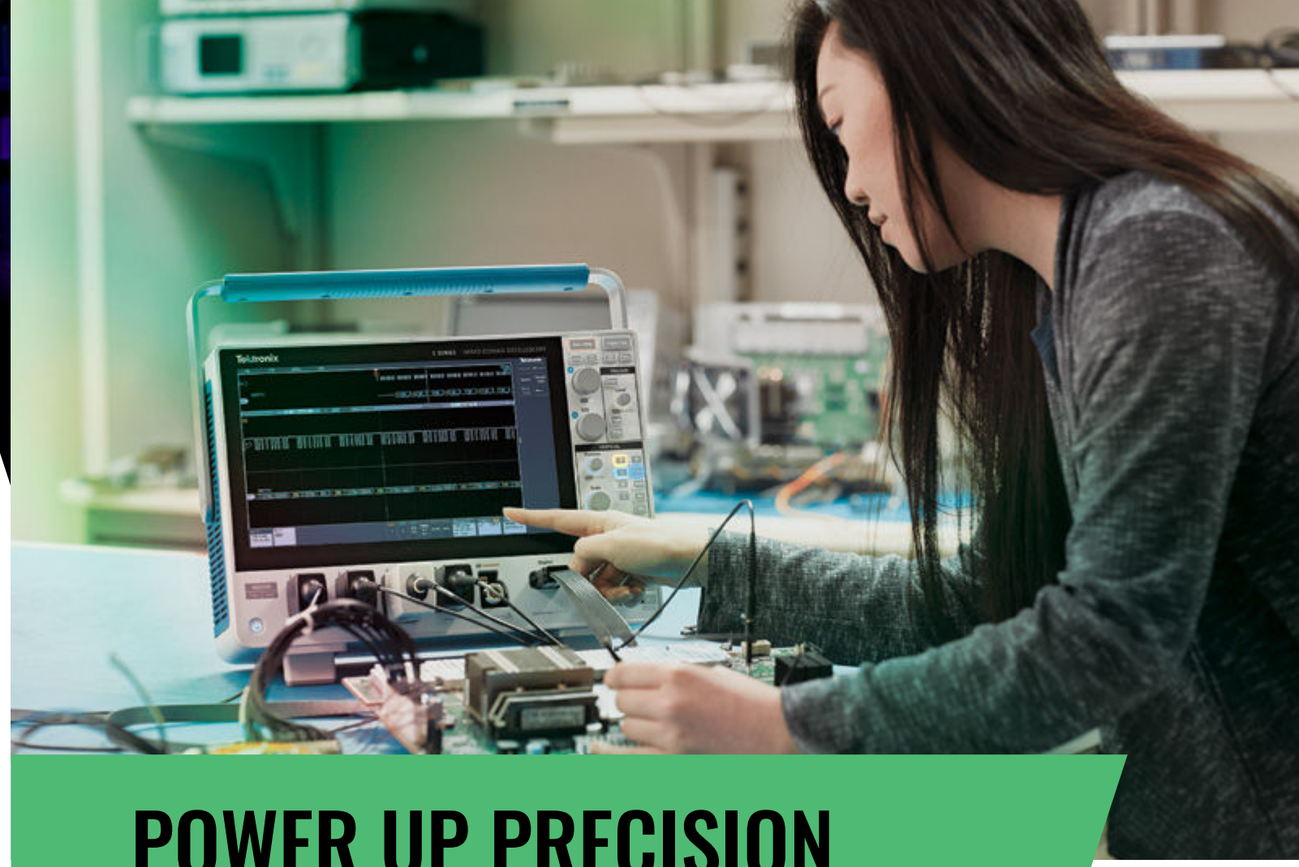
GaNSafe Gen4 GaN Power IC delivers AI data centers and power systems unmatched safety and speed, short-circuit protection in 350ns, 2kV ESD, programmable slew control-all in a simple 4-pin package.

HARTING

Power Connectors

9930060402

Harting's ORV3 connectors deliver plug-and-play power shelf solutions that cut space, boost functionality, and simplify integration for next-gen data center designs.



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Leading manufacturers include:

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FEATURED PRODUCTS

Accelerate Edge AI with ADI's MAX78000 Platform

NXP EdgeReady: Fast-Track Your Next AI-Enabled Design

STM32N6 & MP2: Scalable Platforms for Intelligent Devices

Edge Performance Meets Efficiency: SAMA7G54

Infineon's AI-Ready PSoC™ Kit for Smarter Applications

AI AT THE EDGE: WHERE THE FUTURE OF PRODUCT DESIGN HAPPENS

AI at the edge has moved from concept to expectation. Voice-activated wearables, cameras with built-in recognition, and smart sensors that predict equipment failures are no longer outliers; they are fast becoming the standard. For design engineers, though, embedding AI in these systems means navigating severe constraints: kilobytes of SRAM instead of gigabytes, milliwatts instead of watts, and microseconds of latency instead of cloud round-trips.

AI at the edge has moved from concept to expectation. Voice-activated wearables, cameras with built-in recognition, and smart sensors that predict equipment failures are no longer outliers; they are fast becoming the standard. For design engineers, though, embedding AI in these systems means navigating severe constraints: kilobytes of SRAM instead of gigabytes, milliwatts instead of watts, and microseconds of latency instead of cloud round-trips.

> Efficiency is the new speed. The days of "more power" are over. On the edge, the true measure of performance isn't just speed, it's microwatts per inference. The goal is to do more with less, enabling ai in tiny, battery-powered devices that operate for years, not hours.

The challenge lies in translating models trained on powerful workstations into silicon that must run continuously, often on battery power, without compromising accuracy or reliability. Until recently, engineers were left to bridge that gap manually, rewriting networks, pruning layers, and hand-optimizing DSP code. Today, silicon vendors are building platforms that close the gap by pairing dedicated AI acceleration with toolchains that handle the optimization automatically.

For instance, Analog Devices approaches the problem by embedding a convolutional neural network accelerator directly into its MAX78000 microcontroller. Instead of forcing every multiply-accumulate onto a Cortex-M4 core, inference runs in specialized hardware, reducing power draw to microwatts. Boards like the MAX78000EVKIT# and the feather-sized MAX78000FTHR# let engineers explore vision and audio workloads quickly, while the MAXREFDES178# reference design demonstrates practical face and keyword detection in a complete system. For projects where "always-on" really means always, this level of efficiency makes AI viable in applications as small as a wearable or a door lock.

At the other end of the spectrum, NXP offers engineers two distinct entry points. With its EdgeReady solutions for voice and 3D face recognition, developers can adopt turnkey authentication or natural-language interfaces without building neural pipelines from scratch. When workloads require more flexibility, industrial HMI with multi-modal vision and voice, for example, NXP's i.MX8 and i.MX9 families deliver heterogeneous compute with Arm Cortex-A and Cortex-M cores alongside GPUs or NPUs. Their eIQ software framework supports TensorFlow, PyTorch, and ONNX, giving engineers the freedom to import, quantize, and optimize models for deployment.

STMicroelectronics follows yet another path, evolving its familiar STM32 ecosystem into AI. With the STM32N6 series, the company adds a Neural Processing Unit that brings inference performance measured in GOPS while retaining STM32's efficiency and ecosystem. The STM32N6570-DK board demonstrates this capability for computer vision or audio classification, while the STM32MP257F-DK caters to Linux-class applications with a Cortex-A35, GPU, and TensorFlow Lite support via OpenSTLinux. The critical enabler here is X-Cube-AI, which converts trained models directly into optimized C code, allowing embedded engineers to move from TensorFlow notebooks to running firmware with minimal rework.

For designs where audio dominates, Microchip's SAMA7G54 offers a targeted balance. Built on a Cortex-A7, it provides the external memory interfaces and DSP acceleration needed for voice analytics, acoustic anomaly detection, or predictive maintenance. Because it integrates tightly with the MPLAB ecosystem and supports TensorFlow Lite, engineers can prototype rapidly while maintaining deterministic audio performance, key for real-time classification where milliseconds matter.

> The edge of innovation is at the intersection of hardware and software building an intelligent product isn't about choosing one or the other. It's the seamless integration of purpose-built silicon with intelligent software tools that simplifies complex workflows, allowing you to focus on innovation, not optimization.

Infineon, meanwhile, tailors its PSoC 6 line for flexible IoT prototyping. The CY8CKIT-062S2-AI combines dual-core MCU processing with Wi-Fi and Bluetooth connectivity, plus the sensor interfaces expected in IoT nodes. By bundling ModusToolbox with TinyML and TensorFlow Lite Micro, for tasks like gesture recognition, anomaly detection, and audio classification, the kit makes it straightforward for developers to explore AI in connected, battery-powered applications before scaling to production hardware.

These examples illustrate how suppliers are tackling the same core problems of latency, power, and workflow complexity from different angles. ADI demonstrates that CNNs can run in microwatts. NXP scales from turnkey modules to heterogeneous Linux-class processors. ST leverages its ecosystem to make network deployment accessible to MCU engineers. Microchip emphasizes real-time audio pipelines. Infineon offers a low-friction entry point for IoT prototypes.

What unites them is the recognition that engineers should not have to become AI specialists just to deploy intelligence at the edge. The toolchains now provided, ADI's CNN compiler, NXP's eIQ, ST's X-Cube-AI, Microchip's MPLAB integration, Infineon's ModusToolbox, bridge the gap between workstation-trained models and embedded deployments. Model quantization, pruning, and code generation are handled systematically, freeing engineers to focus on system design and application logic.

Of course, these are only starting points. The embedded AI ecosystem extends well beyond the handful of platforms highlighted here. From microcontrollers optimized for TinyML to advanced NPUs integrated into application processors, the choices are broad and expanding. As a global distributor, we not only provide access to these kits but also to the wider range of AI-capable silicon, connectivity solutions, and HW-SW integration resources. Just as importantly, we deliver the design resources and technical support that help engineers identify the right platform and scale with confidence.

The Path Forward

For design engineers, the question is no longer whether AI can run at the edge but how to deploy it efficiently. With purpose-built silicon, toolchains that translate standard ML frameworks into embedded firmware, and reference platforms that shorten proof-of-concept cycles, embedded AI is now within practical reach.

These kits are only the beginning. The broader ecosystem, from ultra-low-power MCUs to advanced NPUs, offers the flexibility to scale ideas from prototype to production. With the right distribution partner, engineers can navigate that ecosystem confidently, focusing less on hardware constraints and more on creating the next generation of intelligent applications.

EXPERT Q&A

EMBEDDED AI, SMART MANUFACTURING, AND THE NEXT WAVE OF INNOVATION

ANKUR TOMAR

SOLUTIONS MARKETING MANAGER, NEWARK

The world is in the midst of a technological revolution, and artificial intelligence is at the very heart of it. But what does this revolution look like on the ground? How is AI moving from the cloud to the devices we use every day, and what does this mean for the future of manufacturing, energy, and robotics?

In this exclusive interview, Ankur Tomar, Solutions Marketing Manager at Newark, offers a clear look at how AI is shaping the semiconductor and embedded systems industry and explores how AI is moving from the cloud to the devices in our hands.

Q: AI is often described as both an accelerator and an enabler. From your perspective, how is AI shaping the semiconductor and embedded systems industry right now?

A: AI isn't just a buzzword anymore, it's a true game-changer for our industry. It's not about simply doing things faster; it's about unlocking entirely new possibilities. What's most exciting on the embedded side is the rise of "Edge Gen AI." Think about powerful AI systems and generative models running directly on a small device in your hand instead of relying on a distant cloud. This is a huge leap for customers, bringing intelligence to products while keeping data secure and reducing lag and costs.

This AI revolution is happening alongside other major shifts. Wide-bandgap semiconductors like gallium nitride (GaN) and silicon carbide (SiC) are fundamentally changing how we manage power, from charging electric vehicles to powering renewable energy grids. When you combine these with strong wireless connectivity, you get the building blocks for smart factories, smart grids, and connected cars. It's a powerful convergence where semiconductors are not only enabling AI but also making our energy systems smarter and more efficient.

Q: Let's zoom into smart manufacturing. How exactly are companies using AI-powered embedded systems in factories today?

A: Manufacturing has moved far beyond the rigid, robotic automation of the past. Today's factories are flexible, intelligent spaces. Instead of robots repeating the same fixed routine, you'll find mobile robots, collaborative robots (cobots), and even humanoid robots that can adapt to a changing environment.

Take predictive maintenance, for example. We don't have to wait for a machine to break down. Embedded AI can analyze vibration, current, and thermal patterns to predict exactly when a part needs servicing. Add video analytics to the mix, and you get instant quality control that can spot tiny defects on the production line in real time.

We've even seen customers put humanoid robots on automotive assembly lines. You can simply tell robots what to do, "pick up this part," "help with this weld", instead of manually reprogramming them. Generative AI makes this interaction intuitive and natural, which is a major breakthrough for factory adoption.

Q: These technologies sound powerful, but what challenges do companies face when moving from prototyping to production?

A: Security is a top concern. As soon as you connect robots, sensors, and embedded AI to a network, you're creating new entry points for cyberattacks. Protecting valuable operational data is just as critical as building the AI models themselves.

Another hurdle is scaling up. In a controlled test lab, everything runs perfectly. But on a real factory floor, you have noise, variability, and unexpected situations. The difference between a cool prototype and a successful deployed solution is building a robust, cyber-resilient system that can handle the chaos of the real world.

Q: Autonomous robotics is another hot topic. Where do you see real traction in this area?

A: Industrial robotics is entering a thrilling new phase. Cobots are already working safely alongside people, and humanoid robots are being piloted in car manufacturing. The biggest advantages are flexibility and safety: robots can work 24/7, handle dangerous tasks, and adapt quickly to new production lines.

Of course, adoption isn't without its challenges. The cost is still high, and the return on investment depends on the specific use case. But what truly excites us is how fast generative AI is lowering the barrier to entry. Training a robot to understand natural commands or adapt to new environments is no longer a decade-long R&D project. It's happening in a matter of months.

Q: Generative AI has been hyped heavily. Why is it particularly significant for embedded design engineers?

A: Generative AI on the edge is a true game-changer. Cloud-based models like ChatGPT are powerful but come with annoying latency, privacy concerns, and high costs. By shrinking these models to run on embedded hardware, we can bring conversational AI to devices like conference systems, industrial interfaces, or hotel check-in kiosks, all without an internet connection.

We've already created a prototype chatbot that can moderate meetings, translate languages, summarize discussions, and send notes to participants - all on the device itself. In industrial settings, the same technology can power voice-based machine interfaces. The key here is that all of this runs securely on local hardware, so no data ever has to leave the device.

The market potential is staggering by 2031, generative AI is expected to become a $1.01 trillion industry, with over $600 billion of that tied to the infrastructure and hardware that embedded engineers build.

Q: Finally, if you had one message for design engineers exploring AI today, what would it be?

A: Don't be afraid to experiment! The AI space is moving incredibly fast, and it's easy to feel overwhelmed. But the biggest breakthroughs often start as small passion projects. Whether you're interested in predictive maintenance, conversational interfaces, or energy optimization, the most important thing is to start testing and iterating.

The tools are ready, from semiconductors to embedded AI frameworks. The real opportunity now lies in your creativity and how you apply these powerful technologies to solve real-world problems.

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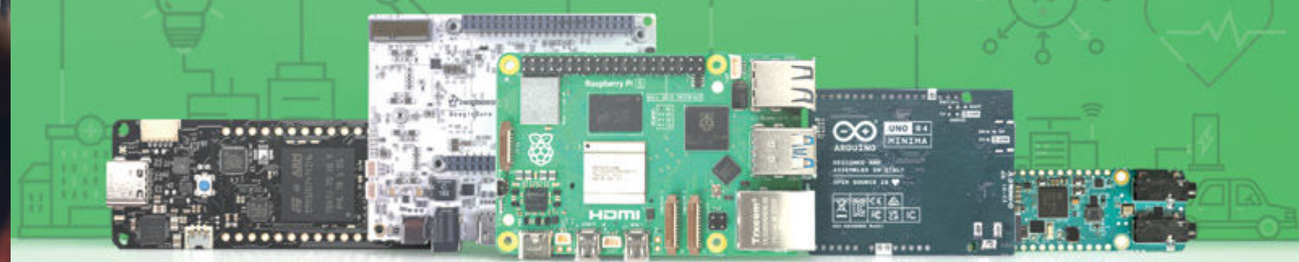

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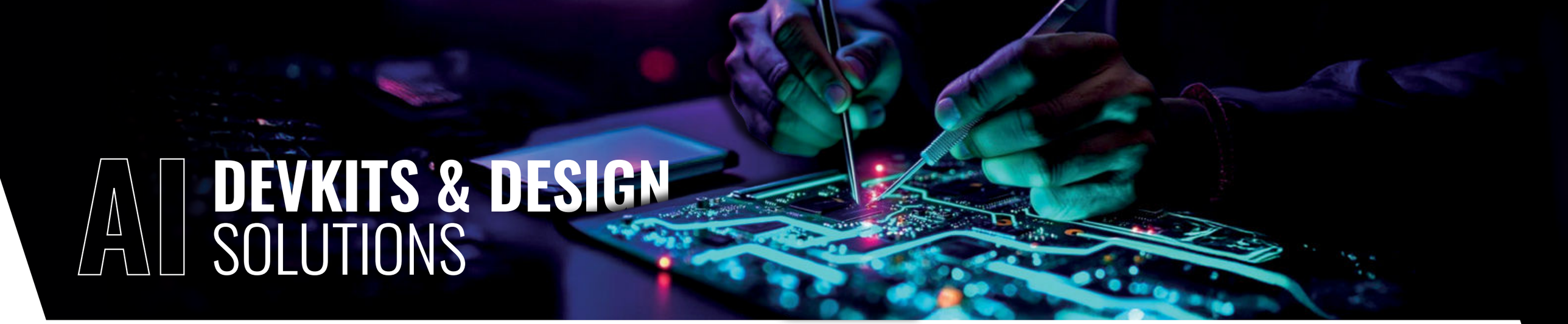

AI DEVKITS & DESIGN SOLUTIONS

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From Vision to Voice - AI at the Edge with MAXREFDES178

Ideal for face identification, keyword spotting, and other image and audio–based AI tasks in compact, low-power devices.

The MAXREFDES178 Cube Camera brings AI to the edge with ultra-low power performance. Built on the MAX78000 Arm Cortex-M4F microcontroller featuring an integrated CNN accelerator, it enables advanced functions like face identification and keyword spotting without draining battery life. The design combines a connectivity board based on the MAX32666 with an AI board powered by dual MAX78000 devices, linked via a compact flex cable. Developers get a complete platform with BLE5 wireless, color image sensor, digital microphone, multiple audio codecs, stereo audio I/O, capacitive touch TFT display, microSD expansion, and onboard QSPI Flash/SRAM. Optimized for fast prototyping, this reference design helps engineers move quickly from concept to deployment in AI-enabled IoT and portable applications.

NXP

EdgeReady i.MX RT106V - Based Smart Voice User Interface Solution

Designed for consumer and industrial applications such as smart TVs, industrial HMIs, and more.

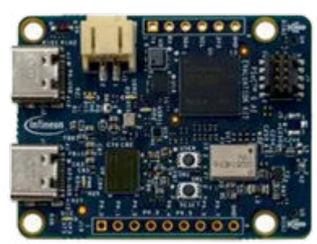
The latest AI DevKits and design solutions accelerate the path from concept to deployment by combining advanced processing, connectivity, and intelligent software. NXP's SLN SVUI IOT EdgeReady solution brings local, online, and Matter connected voice control to smart home, industrial, and appliance applications. Built on the i.MX RT106V crossover MCU with integrated VIT and Speech to Intent, it offers production ready hardware and FreeRTOS software for rapid evaluation and faster time to market. Complementing this, the i.MX RT106V platform integrates a 600 MHz Arm® Cortex®-M7 core, high-speed memory interfaces, and advanced audio peripherals to enable low-latency, high-fidelity voice processing. With multi-microphone support, acoustic echo cancellation, and beamforming capabilities, the system delivers accurate far-field voice detection in noisy environments.

STM32N6570-DK Discovery Kit for Edge AI and IoT

Perfect for home appliances, LED drivers, and building automation applications.

The STM32N6570-DK Discovery Kit is a powerful development platform built on the Arm® Cortex®-M55-based STM32N657X0H3Q microcontroller, designed to accelerate AI, connectivity, and advanced application design. It combines rich peripherals and expansion options with an on-board STLINK-V3EC debugger for a seamless evaluation and development experience. The kit integrates USB Type-C® with Power Delivery, Ethernet with TSN, Octo-SPI and Hexadeca-SPI memory, audio codec with digital microphones, LCD, camera module, microSD™, and ADC support. Flexible extension connectors enable easy add-ons for wireless, sensor, or analog applications, making it adaptable for diverse design needs. With advanced interfaces including CAN FD, I3C, I2S, and high-speed UARTs, plus embedded trace for debugging, this kit gives engineers a complete environment to explore AI acceleration and system integration on the STM32N6 series.

Infineon



CY8CKIT-062S2-AI PSoC 6 AI Development Kit

Optimized for wearables, IoT, and predictive maintenance use cases.

The CY8CKIT-062S2-AI PSoC™ 6 AI Evaluation Kit is a complete platform for developing and testing intelligent IoT and wearable applications. Built around the PSoC™ 62 MCU with dual-core Arm® Cortex®-M4 and Cortex®-M0+ processors, it delivers ultra-low power performance with up to 2 MB Flash, 1 MB SRAM, and CAPSENSE™ touch. The kit supports data collection through onboard radar, acoustic, pressure, and IMU sensors, enabling rapid ML model evaluation with Infineon's Imagimob Studio. It also integrates the AIROC™ CYW43439 Wi-Fi & Bluetooth® combo module, 512 Mb NOR flash, USB host/device, KitProg3 debugger, LEDs, and user button. With an operating range of 1.8 V to 3.3 V, this kit provides everything engineers need to design, prototype, and deploy AI-driven solutions efficiently.

AI-BASED PEOPLE DETECTION TRACKING USING THE STM32N6570-DK HARDWARE

Author: Bheema Rao, Application Engineer, Newark

Real-time person detection on embedded devices at the network Edge encounters several technical hurdles, such as insufficient processing capacity, inadequate memory resources, and the relentless demand for consistent, reliable operation independent of cloud-based processing. Traditional solutions often require offloading AI workloads to external processors or cloud services, introducing latency and dependency issues.

The solution integrates with Avnet's IoTConnect platform, allowing users to track and manage detection results and providing a seamless Edge-to-cloud AI pipeline. This application highlights how the STM32N6570-DK simplifies embedded AI deployment, enabling engineers to implement object detection efficiently, people tracking, and other computer vision applications on constrained hardware while ensuring reliable, deterministic execution.

AI AT THE EDGE

The STM32N6 Discovery Kit is a high-performance development platform that brings Artificial Intelligence (AI) to Edge devices. The STM32N6570-DK development kit, powered by the STM32N6 MCU, addresses these challenges by integrating a high-performance Neural-ART Accelerator™ capable of 600 GOPS, an Arm® Cortex®-M55 core running at 800 MHz, and a dedicated image processor (ISP) pipeline. The combined hardware components enable complex AI models to run directly on the device. The demonstration uses a real-time operating system foundation to show a comprehensive computer vision process optimized for immediate response. This process covers everything from camera input and data preparation to AI processing and output refinement. This platform includes parallel and MIPI CSI-2 camera interfaces and works seamlessly with the Neural-ART Accelerator™ to implement computer vision applications such as object recognition, people tracking, and gesture recognition. When paired with Avnet's /IoTCONNECT cloud platform, it enables real-time computer vision, object detection, and telemetry visualization.

FIGURE 1: STM32N6570-DK development kit

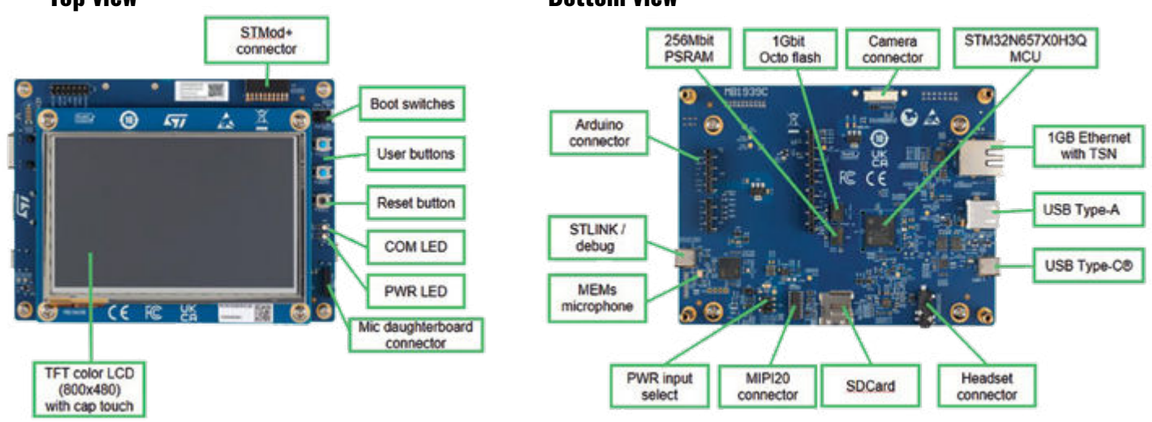


FIGURE 2: Picture showing the top and bottom views with different components

The STM32N6570-DK Discovery kit comes equipped with extensive hardware features that enable the user to evaluate several peripherals, such as USB Type-C®, Octo SPI flash memory and Hexadeca SPI PSRAM devices, Ethernet, camera module, LCD, microSD™, audio codec, digital microphones, ADC, flexible extension connectors, and a user button. Four versatile expansion connectors provide seamless and extensive customization options for specialized implementations, including wireless communication, analog circuit integration, and sensor applications.

The STM32N657X0H3Q microcontroller features one USB 2.0 high speed/full speed Device/Host/OTG controller, one USB 2.0 high speed/full speed Device/Host/OTG controller with UCPD (USB Type-C® Power Delivery), one Ethernet with TSN (time-sensitive networking), four I2Cs, two I3Cs, six SPIs (of which four are I2S capable), two SAIs with four DMIC support, five USARTs, five UARTs (ISO78916 interface, LIN, IrDA, up to 12.5 Mbit/s), one LPUART, two SDMMCs (MMC version 4.0, CE-ATA version 1.0, and SD version 1.0.1), three CAN FD with TTCAN capability, JTAG and SWD debugging support, and Embedded Trace Macrocell™ (ETM).

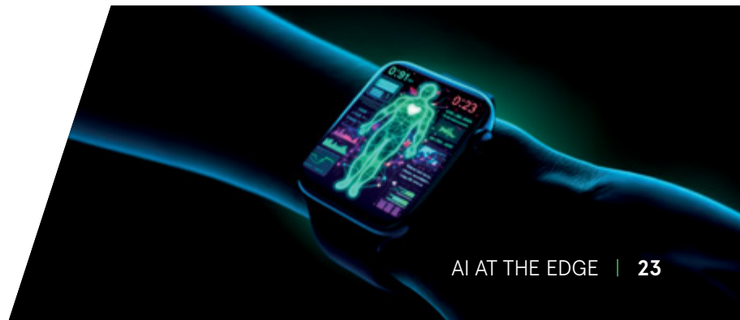
PEOPLE DETECTION

The x-cube-n6-ai-people-detection-tracking application showcases how to deploy real-time people detection with tracking on the STM32N6570-DK platform using a highly optimized pipeline. The system runs on FreeRTOS, enabling a multi-threaded architecture where parallel tasks seamlessly handle camera input, image preprocessing, AI inference, and postprocessing.

Camera data passes through dual Display/Camera Media Image Pre-Processor (DCMIPP) pipelines, which perform operations like cropping, decimation, and downscaling, and feeds into the NPU-accelerated quantized AI model, typically YOLOX, for inference. The Neural-ART Accelerator embedded in the STM32N6 handles these inference tasks efficiently, delivering real-time detection at the Edge.

After processing, the system applies tracking and bounding-box filtering. Tracking and filtering maintain continuity of detected people across frames.

Video rendering uses the LTDC dual-layer subsystem to overlay detection markers on the live camera feed. For development flexibility, users can enable dev mode for quick testing (boot from SRAM) or use external flash boot for standard deployment. This sample effectively demonstrates how the partnership of the STM32N6's vision pipeline, Neural-ART NPU, and RTOS-driven concurrency can deliver robust, low-latency people detection and tracking, all running entirely on embedded hardware.



PEOPLE DETECTION

This guide walks you through setting up the STM32N6 board, programming an AI-based people detection and tracking, connecting to IoTCONNECT, and visualizing data on dashboards—all in a step-by-step format.

Step 1: Prerequisites

FIGURE 3: A complete setup of the AI-based people detection

HARDWARE:

- STM32N6570-DK Discovery Kit
- PC running Windows 10/11Two (2)USB Type-C cables
- Four (4) male-to-female jumper wires
- /IoTCONNECT-enabled PMOD module (DA16200 or DA16600)

SOFTWARE:

- STM32CubeProgrammer (free MyST account required)
- Serial terminal (Tera Term recommended)
- Multimedia player (POT Player recommended for video streams)
- AI application binaries: Object-detection

Ensure all hardware is functional and software is installed before beginning.

Step 2: Prepare the STM32N6 Hardware

1. Connect the camera ribbon cable to the board (blue stripe facing up).
2. Move the Power Input Select Header (JMP2) to the 3-4 position for USB-C power delivery.
3. Connect both USB-C cables from the board to your PC.
4. Set the BOOT1 switch to the right position (Development Boot mode).
5. Press RESET.

The board is now ready for programming.

Step 3: Program the Board

3.1 SET UP THE PROGRAMMER

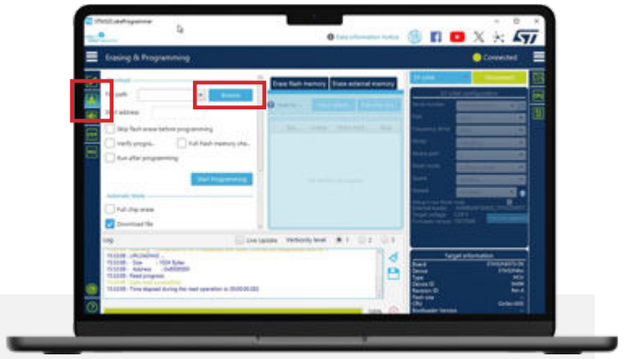
a. Ensure boot pins are in DEV_BOOT mode (BOOT1 = RIGHT, BOOT0 = LEFT).
b. Launch STM32CubeProgrammer.
c. Click External Loaders and select STM32N6570-DK.
d. Set Connection Type to ST-LINK and ST-LINK mode to Hot Plug.
e. Click Connect.

Step 3: Program the Board continued...

3.2 PROGRAM THE BINARIES

The STM32N6 project code organization has three key binaries:

a. Bootloader - Initializes system hardware, validates firmware, and enforces secure boot
b. AI Model - Contains optimized model data for Neural-ART accelerator
c. Application - Implements core functionalities (e.g., AI inference, camera processing)



Download the corresponding project binaries from the GitHub page.

Step 3.2.1: Bootloader

- Browse and select ai.fsbl.hex.
- Click Start Programming and wait for completion.

Step 3.2.2: AI Model

- Browse and select network_data.hex.
- Click Start Programming.

Step 3.2.3: Application

- Browse and select the application binary (x-cube-n6-ai-people-detection-tracking-dk.hex).
- Set Start Address: 0x70100000.
- Click Start Programming.

Now move BOOT1 back to the LEFT position to boot from the external Flash, disconnect the programmer, and press RESET.

Step 4: Set Up /IoTCONNECT Cloud Account

1. Register for a free trial on /IoTCONNECT - / IOTCONNECT Free Trial (AWS Version)
2. See the /IoTCONNECT Subscription Information for more details on the trial, including message limits.

Step 5: Create Device Template

1. Download the premade template stm32n6_vision_device_template.json.
2. Log in to /IoTCONNECT console.
3. Go to Devices > Overview > Import Template and upload the JSON file.

This defines the telemetry and commands your device will support.

PEOPLE DETECTION

Step 6: Create Device Instance

1. Click Device > Create Device.
2. Enter MySTN6 as both Unique ID and Device Name.
3. Select your entity (only one option in trial).
4. Select n6uvc as the template.
5. Set Device Certificate to Auto-generated.
6. Click Save & View.
7. Download connection info as MySTN6-certificates.zip.

This provides the credentials to configure your PMOD module.

OBTAIN CONNECTION INFO

1. Go to Settings > Key Vault in / IoTCONNECT.
2. Note your Company ID (CPID) and Environment (ENV) variables.
3. These values will be used to configure the PMOD module.

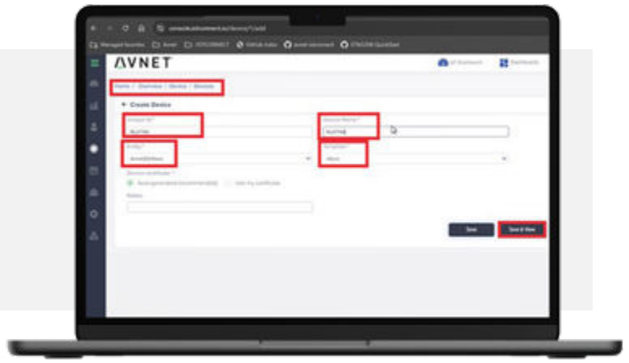


FIGURE 5: IoTConnect window showing 'Create Device'

Step 7: Flash and Configure DA16k PMOD

1. Follow the DA16K QuickStart Guide to flash the PMOD.
2. Enter the /IoTCONNECT connection info and device certificates from Step 6.
3. Connect the PMOD to the STM32N6 board via the male-to-female jumper wires.

STMOD+ HEADER REFERENCE

PMOD pin #	2 (RX)	3 (TX)	5 (GND)	6 (+5V)
STMOD+ pin #	2 (UARTy_TX)	3 (UARTy_RX)	16 (GND)	6 (+5V)

Step 8: Run the AI Application

1. Power off the board and connect the PMOD to the STMod+ header.
2. Reconnect USB-C cables.
3. Launch a multimedia player (e.g., POT Player) on your PC and select the camera input.
4. Video stream will display bounding boxes around detected objects.

Note: Video must be running for AI inference to activate.

Step 9: Verify Data Stream and Dashboard

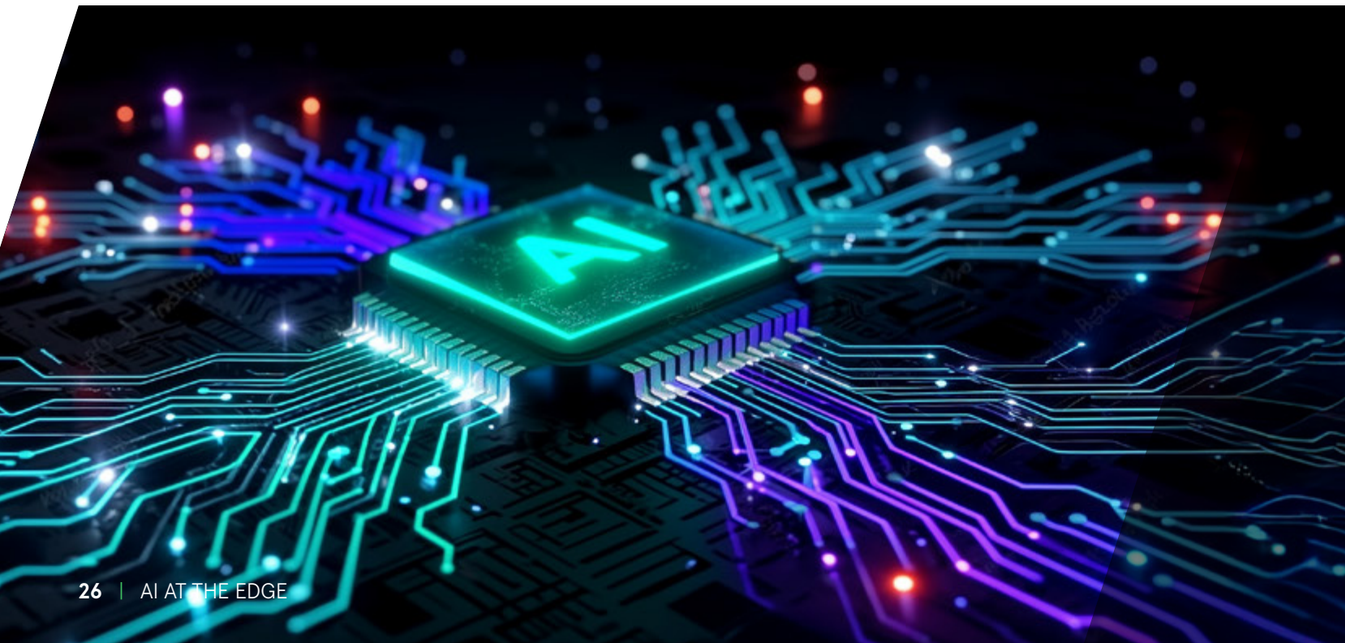
1. In /IoTCONNECT, verify the device status shows Connected.
2. Download the dashboard template as shown in step 6.
3. Create a new dashboard using the template and associate it with device MySTN6.
4. Customize widgets as needed and save.

Now you can visualize real-time object counts, model confidence, and approximate distances.

Step 10: Demo Overview

This demonstrates how AI inference on the Edge can combine with cloud dashboards for actionable insights. The demonstration identifies individuals in real-time by drawing bounding boxes around each person in the camera feed while displaying the current person count. A rough distance approximation can be calculated using the ratio of the bounding box size to the overall image, serving as a proof of concept. The system also visualizes the AI model's confidence using gauge charts. Additionally, all detection results and telemetry are integrated with Avnet's IoTConnect platform for monitoring and analytics.

FIGURE 6: IoTConnect dashboard for the execution of people detection



CONCLUSION: EDGE AI MADE SIMPLE

The STM32N6 Discovery Kit, paired with /IOTCONNECT, empowers developers to rapidly prototype AI-enabled IoT applications. By following this step-by-step guide, you can deploy real-time object detection, visualize data in the cloud, and explore a range of AI use cases. Edge AI is no longer a theoretical concept—it is now accessible to engineers and hobbyists alike.

The STM32N6 and /IoTCONNECT make it easy to turn sensor data into insights, create smarter devices, and accelerate innovation in AI-driven IoT applications.

NOTE: The above project execution has been referred from the following resources:

WEBINAR
NEW ERA OF COMPUTING: RAPID VISION EDGE AI POCS LEVERAGING THE STM32N6 MCUS.

GITHUB
STMICROELECTRONICS STM32N6 QUICKSTART GUIDE.

THE EDGE

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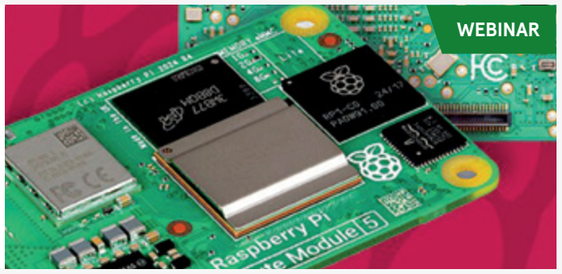

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EVENTS

NEWARK STRENGTHENS SUPPLIER AND CUSTOMER RELATIONSHIPS AT 2025 TENT EVENT

Newark, together with Avnet, hosted its annual Tent Event at the Newark Center of Excellence in Richfield, Ohio. Nearly 400 attendees, 75+ suppliers, and two days of collaboration under the Power of One.

From supplier showcases to customer training sessions led by STMicroelectronics, Tektronix, NXP, and NI, the event highlighted the latest innovations while strengthening relationships across the supply chain.

The Tent Event has become a cornerstone for building trust, sparking new opportunities, and delivering more value to suppliers and customers alike.

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WE'RE ATTENDING EMBEDDED WORLD NORTH AMERICA

We're excited to be part of Embedded World North America this November in Anaheim. Already a long-standing event in Europe, this is only the second time it's being held in North America.

Expect a strong lineup of demos and top suppliers as we showcase the technologies shaping embedded systems today and tomorrow. Stay tuned for updates on what Newark will be bringing to the show floor.

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NEWARK UPDATES

AWARDS

NEWARK RECOGNIZED WITH MULTIPLE AWARDS AT EDS 2025

Newark was honored with multiple awards at the 2025 EDS Leadership Summit in Las Vegas,reflecting our ongoing focus on growth, customer service, and supplier collaboration.

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- Distributor of the Year from Grayhill
- America's Exceptional Growth Award CY 2024 from Omron
- Partner Appreciation "Snake Award",from YAEGO Group
- Fastest Growing Distributor Award from ECS Inc. International.

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NEWARK RECOGNIZED WITH ARDUINO "ALWAYS ON" AWARD

Newark was recognised with Arduino's "Always On" Award for our long-standing partnership and outstanding performance. From the launch of the iconic Arduino Uno to today, we've collaborated to drive innovation and support for makers, engineers, and enterprises worldwide.

This award reflects the dedication of our teams and the strong relationships we've built with partners like Arduino.

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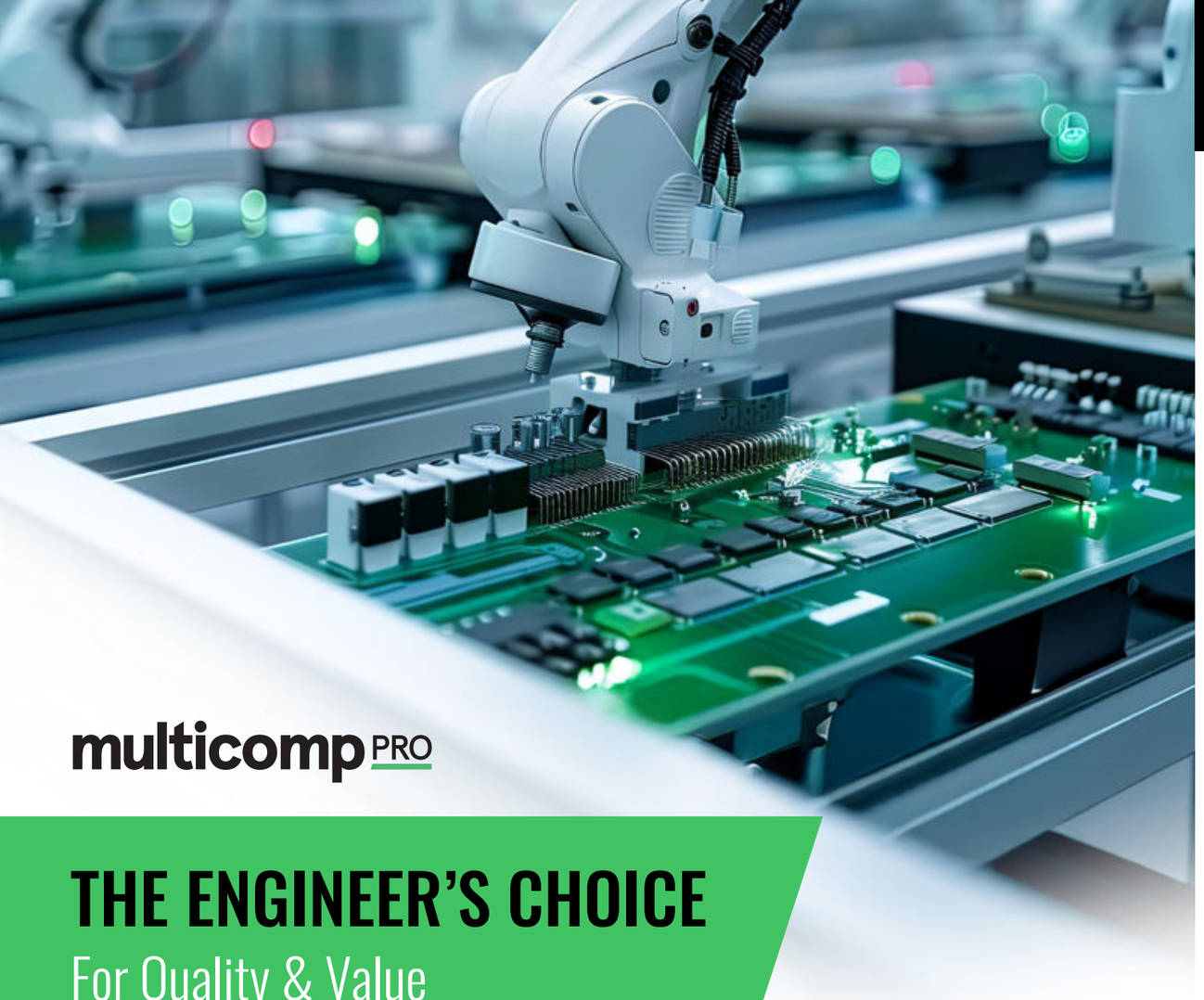

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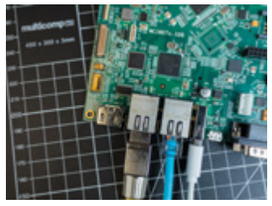

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