Edge AI Partner Program

Seeed Edge AI Partner Program is free to apply anytime. We are aiming at becoming the most reliable hardware platform and empowering everyone to achieve their digital transformation goals. Seeed’s Edge AI platform provides devices, carrier boards, peripherals, software tools and ML solutions. If you are working on AI products based on NVIDIA Jetson Platform, including Jetson Nano/Xavier NX/Orin NX/AGX Xavier/AGX Orin, we are looking for global AI partners to join us as:

- Enterprise AI software partner
- AI solution integrator
- Community co-inventor
Co-invent with Seeed

seeed studio

Transform Your Business Delivering Real-World AI Together

Integrate your unique AI technique into our current hardwares: resell or co-brand licensed devices at our channels.

Build your next-gen AI product powered by the NVIDIA Jetson module and bring your product concept to the market with Seeed’s Agile Manufacturing 0-∞
Work with Seeed Amazing Ecosystem

Seeed is NVIDIA’s official reseller and ecosystem hardware partner. By consolidating our best-in-class hardware and cutting-edge technology from our software partners and the community, we aim at helping both developers and enterprises deploy ML in the real world across industries. Contact us at: edgeai@seeed.cc

We are looking forward to working with AI experts, community developers, software enterprises, and system integrators:

- Integrating your unique technology, resell or co-brand licensed solution with us.
- Building next-gen AI products powered by the NVIDIA Jetson module, one-stop bringing your product to the market with Seeed’s manufacturing, fulfillment, and distribution.
- Working with Seeed Amazing Ecosystem Partners together, unlocking more AI possibilities.

Speed time to market with amazing developer tools and solutions
Edge Impulse

Edge Impulse is the leading development platform for machine learning on edge devices, free for developers and trusted by enterprises. Edge Impulse made ML development easier, accelerate ML solution development using low-code to advanced integrations with the support from an expert.

Find our partner >> edgeimpulse.com

Build ML pipeline for deploying audio, image classification, and object detection applications at the edge

Users of Edge Impulse can leverage the power of the Jetson Nano for their embedded machine learning applications that demand higher performance, alongside the industry's leading embedded ML platform that offers:
- The easiest-to-use embedded machine learning pipeline for deploying audio, image classification, and object detection applications at the edge with zero dependencies on the cloud
- Streamlined acquisition of critical environmental sensor data, previously discarded or only sent to the cloud, for empowering sensor fusion at the edge.

Deploy hard hat detection for enforcing workplace safety

With Edge Impulse, you can easily deploy an automated real-time detection for hardhat-wearing compliance, along with the alert at the workspace. PPE compliance also includes gloves, masks, goggles, etc. You can also build custom model training for the full PPE detection pipeline.

Application:
Embedded Machine Learning
Computer Vision

Industry:
Industry 4.0, Manufacturing, Retail

Supported Hardware
All Seeed’s NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit
Getting Started with Deci on NVIDIA® Jetson Devices

Our collaboration with Seeed will empower countless users with optimized deep learning models ready for instant deployment,” said Yonatan Geifman, CEO and co-founder of Deci. “No matter the hardware, nor if deploying on the edge or cloud, developers should have full accessibility to the latest developments in deep learning; this partnership brings us one step closer to that goal.”

Deci’s platform includes several modules, one being a cloud-based runtime optimization engine which enables users to automate the manual model compilation and quantization processes (OpenVino and TensorRT) on a wide variety of hardware types with just a few clicks. The result is an optimized model for the user’s inference hardware. Users can also use the platform to optimize models for edge devices, a process that typically can only be carried out after users have purchased the devices themselves.
Efficient remote AI system based on NVIDIA Jetson platform

Edge AI Transforming Agricultural Landscapes
Farmers installed AI-driven cameras all around the farmstead to record, detect, and monitor livestock health and their lifecycle in real-time. These cameras are connected to and powered by edge devices, enabling the farmer to make informed data-driven decisions, be alerted to, and stay ahead of crisis situations, ultimately leading to the improvement of cattle management and economic growth.

Allxon Out-Of-Band (OOB) technology provides rapid disaster preventive measures. Seeed's Jetson Powered edge devices that enable data-driven smart farming are highly safeguarded in an electrical enclosure, forming the nucleus where “ALL” data is perpetually collected and processed 24/7, 365 days a year.

It is imperative that the systems work seamlessly and uninterrupted for a highfunctioning farmstead.
Facing The Gap between AI’s PoC to Production: Fewer Datasets, Faster Training

Machine learning is quite widely adopted in software industry applications like social media, YouTube, and E-commerce. It is not tough to acquire a billion level data through the internet experience. However, looking into real-world applications, there are many other industries that only have access to small data, for example, medical imaging, manufacturing, and environmental research.

Use transfer learning along with Ultralytics YOLOv5 and Roboflow to train a dataset with very few samples. We first initialize a model with weights from a pre-trained model and then start training the machine learning model that we need using a dataset as small as 200 images.

Application:
Object Detection

Device Support:
All Seeed’s NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit

YOLOv5
YOLOv5 is a family of compound-scaled object detection models trained on the COCO dataset, and includes simple functionality for Test Time Augmentation (TTA), model ensembling, hyperparameter evolution, and export to ONNX, CoreML and TFLite.
Learn more at ultralytics.com

Object Detection
Application:
Device Support:
All Seeed’s NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit

10K images or 200 images?
Robotics is a field of integrations, not merely development. You need to choose the correct computing power; you need to choose the right sensors, not develop them. It comes down to software integrations. With Nimbus, Cogniteam’s cloud-based solution for robot developers and operations, all the above becomes simpler.

We are glad to partner with Cogniteam, aiming at delivering the easiest ever robot development process, from prototyping to production, including configuration, testing, deployment, and operations management.

Nimbus supports Seeed made Jetson powered platform carrier boards and min PCs, attach sensors such as RPLidar and cameras to build your robotic application from scratch.

You can also seamlessly connect your existing ROS projects to Nimbus. Based on the open-source Robot Operating System (ROS), Nimbus is truly a ‘plug and play’ solution.
Seeed and alwaysAI Partner to Accelerate Deploying Computer Vision at The Edge

Seeed and alwaysAI began their cooperation with NVIDIA® Jetson™ powered devices. The partnership makes computer vision come alive on the edge - where work and life happen:

Retail
Using data from existing cameras (such as IP or surveillance cameras) retailers are leveraging alwaysAI to count customers in their store in real-time, see time-based and seasonal trends from customer occupancy, customer movement, and dwell time.

Construction
alwaysAI is deploying applications in construction to help assess real-time progress of construction projects as well as track safety through personal protective equipment monitoring such as hardhats, safety glasses, and reflective vests.

Transportation
alwaysAI solutions within Transportation are helping the world transition to cleaner vehicles and helping fleet managers understand more about their passengers. Through passenger counting, queue counting, and in-cabin analytics, alwaysAI customers have used computer vision to increase revenue and decrease costs with computer vision AI.

alwaysAI
alwaysAI is a leading computer vision development platform for creating and deploying machine learning applications on edge devices like the NVIDIA® Jetson™. alwaysAI removes barriers, making creating computer vision apps easier, faster and more effective across all industries

Find our partner >> alwaysai.co

Industry:
Retail, Construction, Transportation

Application:
Computer Vision

Device Support:
All Seeed’s NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit

Accelerate Deploying Computer Vision onto Edge Devices
Detecting safety helmets in realtime

Personal Protective Equipment (PPE) has made its way into mandatory requirements of construction sites due to its importance to workers' safety. Tryolabs leverages Seeed’s reComputer edge devices built with Jetson Xavier NX 8GB module develop a computer vision analytics solution that tackles a challenging task in today’s industry 4.0 era - detecting safety helmets in real-time.

YOLOv5 vastly outperformed Faster R-CNN, obtaining better metrics in a much shorter time. In terms of inference time, both models performed similarly, taking around 0.08 seconds for each image on the edge device (12.5 FPS). By leveraging DeepStream SDK, the inference time was boosted to a staggering 0.012 seconds for each image (82.8 FPS) on the same NVIDIA Jetson Xavier NX.
Train a working computer vision model with fewer images

We work with Roboflow to annotate images, directly import images or videos. Roboflow help distribute the dataset into “training, validation, and testing”, as well as add further processing to these images after labeling them. Furthermore, it can easily export the labeled dataset into YOLOV5 PyTorch format which is what we exactly need for fewer dataset needed!

You can download a number of publicly available datasets such as the COCO dataset, Pascal VOC dataset and much more. Roboflow Universe is a recommended platform which provides a wide-range of datasets and it has 90,000+ datasets with 66+ million images available for building computer vision models.

Industry:
Retail; Traffic Management; Manufacturing

Application:
Computer Vision

Hardware used:
All Seeed’s NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit
Robot Security Guard Patrols Hong Kong Parking Lot

Patrol Robot is a new milestone in the development of security systems - an emerging stage of technological development that has brought the industry to a new standard of best practices for safeguarding people and property. Autonomous mobile robots designed for patrolling could reduce, over time, completely eliminate the need for human workers to keep large Armitage’s Patrol Robot solution brings 24/7 peace of mind to Hong Kong’s underground parking lot with fully automatic robotic security guards without operator supervision.

- License Plate Recognition System (LPRS)
- Operate 24/7 without human intercection
- Facial recognition, people counting
- Fire and smoke alarm

**Benefits:**

Reliable 24/7 security monitoring, day or night, in any weather. Capable of identifying various types of objects/situations. Real-time video and transmission. Significant savings in manpower and filling the loophole after staff’s patrol each time. Reduced driving, walking, idling, and unnecessary effort in finding a space.
Towards Under-ice Sensing using a Portable ROV

From 2020, Smart Ocean Systems Laboratory from the University of Rhode Island is working on the project of Navigating Unmanned Underwater Vehicles (UUVs) at the Ice-water Boundary. The project team reported their progress in using a portable ROV for under-ice sensing, and demonstrate the feasibility of using small ROVs (0.7m long and 0.5m wide) to sample the under-ice environment near the coast. The recent field trials were conducted in Utqiagvik, Alaska in March 2022.

Field tests were conducted in March 2022 in Utqiagvik, Alaska on a flat landfast ice about several hundred meters off the coast. The ice thickness was about 1.5 meters. As shown in the picture, ROV was lowered through a rectangle ice hole using straps with hooks at the end. The recovery was done by manually driving the ROV to the hole, then the straps will hook onto the ROV for lifting.

**Smart Ocean Systems Laboratory**

The SOS lab is founded in October 2018 by the Principle Investigator, Mingxi Zhou. The lab is located at beautiful Narragansett Bay Campus, University of Rhode Island. The lab has various types of marine robotic platforms and a full suite of sensors for conducting research.

**Industry:**
Ocean Research

**Application:**
Robotics, ROV

**Hardware used:**
- BlueROV2
- Add-on sensors
- Jetson Sub Blue mini PC based on NVIDIA Jetson Xavier NX

**Success Case**

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Meet PITAKURU, an Autonomous towing robot capable of towing loads in the warehouse

Challenge:
Moving businesses online becomes new mainstream trends, making delivery services the new normal. In line with the growth of the online business, the demand for courier services that help deliver the ordered packages has risen significantly. Accordingly, the burden it has on the workers also increased.

Solution:
In face of this new challenge, KEISUUGIKEN and Seeed came together to provide an autonomous towing robot called “PITAKURU”. “PITAKURU” has the ability to track humans while towing heavy objects and can be operated indoors and outdoors. It uses laser tracking, enabling to follow individuals without being affected by external light, and there is no need to install accessories such as tracking beacons. These features enable “PITAKURU” to be used anywhere with easy access, even if the users are unfamiliar with the use of towing technologies.

Result:
By introducing “PITAKURU”, the amount of cargo that can be handled by one worker will increase up to two to three times more, and the time needed to move packages around the warehouse, enhancing visibility of traffic.
Precise livestock management helps farmers optimize livestock productivity

“With Seeed’s reComputer J1010, we can reduce the management cost per animal by 98% compared to the competing solution that relies on GPU-cloud because the Edge AI solution with Jetson could provide the lowest inference cost per a camera channel.” said Kwang Myung Jeon, CEO at Intflow Inc.

Challenge
The livestock industry is huge, however, several issues impede its productivity, such as the soaring feed prices due to extreme weather conditions, disease risk, environmental and pollution regulations.

Solution
Intflow provides EdgeFarm, an AI solution that perceives livestock injuries and diseases to help farmers manage and optimize livestock productivity. EdgeFarm obtains the biometric data of each 40 piglets for each ceiling-mounted camera. It measures real-time data of the pigs for example, its eating and exercising habits.
Sentiment analysis in the retail industry becomes more accessible

Challenge
Brands need to understand their customers on a deeper level. Passive solutions such as facial analysis sit on the cutting edge of AI and provide rich information. But they comprise many bits and pieces, making them hard to deploy in stores. In addition, brands operate under continuous changes in merchandise display, floor plan layout, audience demographics, and regional trends.

Solution
Zenus and Seeed came together to provide an all-in-one solution powered by NVIDIA Jetson to simplify the process and fulfill your needs. Picture a smart device that connects to any camera and processes the video feed locally. All you need to do is power up the unit and it instantly works. The device sends the meta-data to the cloud to generate actionable reports. You have access to real-time metrics such as impressions, demographics, positive sentiment levels, and more. All the information is ethically sourced and displayed on a live dashboard.

Results
Improve conversion rates and increase sales by up to 382%
Assess consumer satisfaction and demographics with over 95% accuracy

Zenus
Zenus is an Austin, Texas, startup that offers a fully-integrated solution for safe data capture of consumer behavior. Zenus has packaged powerful AI models into a smart device powered by NVIDIA SoMs, to drive the ethical use of facial analysis for the in-store retail market. Their proprietary technology produces reports about consumer behavior and engagement without the risk of data theft or personal identification.
Find our partner >> zenus.ai

Industry:
Retail

Edge Device Used:
Seeed A206 Carrier Board compatible with Jetson Nano/Xavier NX/TX2 NX
Meet Techie:
on-demand autonomous delivery robot

Challenge:
Many businesses have started to rectify their last-mile delivery operations. Their current operational process is to hire third-party courier companies, and it is very inefficient as it requires an astonishing amount of effort and time. Furthermore, as e-commerce continues to thrive, it will cause an upsurge in parcel deliveries and other issues, especially in densely populated cities.

Solution:
Techie is a smart navigation delivery robot built by Azimorph, seeking to eliminate the need for door-to-door deliveries. The robot would navigate its way toward the consumer’s house according to the time selected by the consumer beforehand. After which, Techie will return to the centralized bay to charge or load up more parcels. Techie comes with a safety feature that stops it when danger or unforeseen circumstances are detected, for example, a human in its path, construction zones, or roadblocks.

Result:
- Reduced manpower cost, no need for last mile delivery drivers
- Reduced cars on the road, decreasing traffic congestion
- Reduced vehicle pollution
- Faster than traditional couriers, would not be stuck in the traffic or subjected to any delivery drivers’ schedule
- Do not require rest like delivery drivers, able to work 24/7

Azimorph

Founded in 2021, Azimorph is a group of passionate engineers based in Singapore who aim to make robotics’ delivery the new normal.

Industry:
Smart Logistics

Application:
Delivery Robot

Edge Device Used:
reComputer J2012, powered by NVIDIA Jetson Xavier 16GB
**NLP simplifies industrial communications and improves manufacturing productivity**

**Challenge:**
In the industrial manufacturing workplace, workers are constantly having to leave their stations to communicate information. Having to manually locate individuals throughout the facility or use a tedious data input solution prevents workers from completing their jobs. Is there any way we can optimize the workflow of asynchronous communications to benefit both the worker and the workplace?

**Solution:**
Malamute uses natural language processing (NLP) and spatial computing to help improve workplace productivity and process traceability. Powered by NVIDIA Jetson Orin and AGX Xavier and working with NVIDIA Riva, Malamute's AI-layered audio communication network empowers industrial workers with the right data at the right time. The NLP-powered communication system helps improve overall equipment efficiency by keeping workers focused on their jobs and at their stations. Employees can record voice messages regarding operational situations and processes which get sent to the intended audience. This allows for effortless and efficient communications compared to a Walkie-Talkie, phone call, or email.

**Result:**
Minimizes worker travel for communications, Maximizes worker productivity, Improve workplace efficiency.
No-code MLOps enables a variety of AI use cases at the edge

“Seeed continues to serve as an instrumental resource for Teknoir with their offering of innovative edge AI hardware solutions. Seeed’s devices provide Teknoir with unique opportunities to develop AI solutions for its customers that address a variety of important use cases at the edge.” -- Jonathan Klein, Founder & CEO at Teknoir

Teknoir, offering MLOps platform and AI solution company, has been working with Seeed’s reComputer J2011 and reTerminal, with their no-code Dev Studio for industry 4.0 applications such as workers’ safety, manufacturing of workforce optimization, and preventative maintenance and smart city of recycling materials detection. Coupled with cameras, LTE and running Teknoir’s Orchestration Engine, these edge devices have secure connectivity to the Teknoir Cloud. Teknoir’s client-partner is able to use the Dev Studio for pushing their trained machine learning model, as well as managing the fleet of hardware and software.