How Xvisio deployed edge inferencing capability on AR devices with OpenVINO™ toolkit

Deploying an offline trained model to Xvisio technology's SlimEdge XR Starter Kit seamlessly and effectively

At a Glance: Xvisio Technology

Xvisio Technology offers total vSLAM solutions targeted for AR/VR/MR HMD and robotics applications with high-speed, high-accuracy on device processing. It also provides advanced features such as plane detection, super impose, 3D reconstruction, gesture, object recognition, and 3D localization.

One of their key newly released products, SlimEdge XR Starter Kit B50, is a spatial perception, interaction, and AI platform for AR powered by the Intel® Movidius™ Myriad™ X VPU. The Intel® Distribution of OpenVINO™ toolkit is a part of their software tools for AI model calibration and implementation.

> " *As a long-time developer and partner of Intel® Movidius™ VPUs, we have successfully addressed the market needs of IoT and edge computing for AR/VR and robotics with the industry top notch Intel® Movidius™ VPU family. Intel® Distribution of OpenVINO™ toolkit enables us to leverage massive amount of existing resource to deploy the AI capability into our products seamlessly and effectively.* "
>
> ### John Lin
> Founder, President and
> CEO of Xvisio Technology

Augmented Reality (AR) is continuously growing and capturing people's attention. Potential uses and applications of AR are evolving rapidly across a wide range of industry verticals, such as entertainment, education, retail, healthcare, transportation and manufacturing. New AR technologies continue to garner widespread consumer and enterprise interest, with the value of the global AR/VR market expected to touch $209.2 billion by 2022.[1] The explosive growth of the segment can be attributed to the ubiquity of AR applications since AR can potentially be leveraged anywhere, becoming a common presence at work or in everyday life.

Hardware components required for AR are a processor, display, sensors, and input devices. AR devices are regarded as the next generation computing platform, especially with the imminent deployment of 5G networks. It is becoming increasingly evident that smartphones, AR glasses and headsets will coexist and expand significantly the range of possible AR experiences of tomorrow.

Challenge

Though AR solutions continue to witness increased demand, developers in the sector still face several challenges. The complexity of building an AR system requires advanced spatial sensing and computing technology based on vSLAM - a computing intensive challenging task for wearable devices. Also, the AR device is a typical IoT-based hardware that requires local data collection and processing to enhance user experience. As a new computing platform and tool, AI support is an essential capability in such devices. Hence, the two biggest questions facing developers are:

- How can you enable users to develop content easily?
- How to leverage the massive models trained offline using different frameworks and tools?
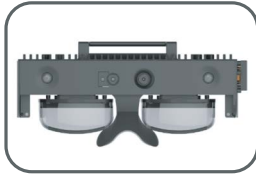
Solution

Xvisio Technology has risen to the challenges faced by AR solution providers by deploying the vSLAM engine, depth sensing engine, video and audio processing engine, display unit, and the convolutional neural networks (CNN) based inferencing engine on a single platform. The SlimEdge XR Starter Kit B50, powered by Intel® Movidius™ VPUs, is a well-calibrated device with multiple cameras and sensors for AR, AI, and computer vision (CV). It offers a user-friendly environment to implement offline trained models to the SlimEdge XR, using the Intel® Distribution of OpenVINO™ toolkit. The kit also empowers developers to seamlessly deploy AR applications with state-of-the-art AI technology.

About the Product: SlimEdge XR Starter Kit

SlimEdge XR Starter Kit-B50

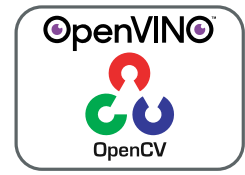**A spatial perception, interaction, and AI platform for AR**

Starter Package

SlimEdge XR AR HW engines	SlimEdge CP Computing Pack	SlimEdge SDK AR/AI/CV SDK	SlimEdge TC Tool Chains

The SlimEdge XR starter kit is a highly integrated platform for AR, AI and CV workloads.

This is a one-stop solution built on a well calibrated device to assist customers deploy AR and AI solutions as a simple plug-and-play interface.

Starter Kit Features

- One-stop shop for AR, AI and CV development platform
- Cross hardware and OS platforms with one device
- Highly integrated edge processing for SLAM and depth
- Fully calibrated system for AR and CV applications
- Edge computing to offload host resource loading

- Plug and play for app development with SDKs and tools
- Eye pleasing 50° Field of Vision (FOV) 4K resolution display (2K per eye)
- Mass production support with solid supply chain engagement
- 5G ready for cloud application
- Compact and portable

Leveraging the Intel® Distribution of OpenVINO™ Toolkit

Collaborating with Intel, Xvisio is incorporating deep learning and inferencing capabilities of the Intel® Distribution of OpenVINO™ toolkit to deploy an offline trained model to SlimEdge XR Starter Kit. OpenVINO™ toolkit is part of Xvisio's software tools for network calibration and implementation. Xvisio uses Intel® Movidius™ VPUs to handle edge inferencing tasks for AR glasses and robotics applications. Xvisio offers platforms that enable users to develop their own applications. OpenCV and OpenVINO™ toolkit included in the tool chain help leverage vast amount of existing resources to accelerate development.

Key Benefits

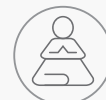| Seamless Deployment	Accelerating Development & Reducing Costs	Easy Access to Pre-Trained Models	Optimized Training Models
SlimEdge XR Starter Kit is a fully calibrated system with different cameras and AR displays integrated with Intel® Movidius™ Myriad™ X VPU. It is a one-stop solution for AR, AI and CV applications with state-of-the-art SDK and toolkit support.	The SlimEdge XR Starter Kit with the OpenVINO™ toolkit can shorten the development cycle and reduce the financial outlay in XR, robotics and other CV and AI related fields.	Developers can leverage more than 100 different models in Open Model Zoo seamlessly on the SlimEdge XR with the OpenVINO™ toolkit.	Xvisio training tool helps developers train their models and convert them to the BLOB file format supported by SlimEdge XR and the OpenVINO™ toolkit.

Conclusion

AR devices, empowered by state-of-the-art AI technology, are changing the way we interact with the world, and are gradually becoming the next generation personal device and work equipment. However, there are still several roadblocks facing AR developers, especially in deploying edge inferencing capabilities in devices. Working together with Intel, Xvisio has created a successful solution to enable fast implementation of edge inferencing capability for AR platforms with the Intel® Movidius™ VPU family and the Intel® Distribution of OpenVINO™ toolkit.

About Intel® Distribution of OpenVINO™ Toolkit

The Intel® Distribution of OpenVINO™ toolkit, an open visual inference and neural network optimization toolkit, is free software that helps developers and data scientists speed up computer vision workloads, streamline deep learning inference and deployments, and enable easy, heterogeneous execution across Intel's platforms - from edge to cloud.

Download OpenVINO™ toolkit