NXP’s automotive-grade deep learning toolkit unleashes 30x higher performance for next-generation automotive applications

- Aims to maximize customer efficiency through rapid deployment of neural networks
- Offers deep learning toolkit with software, tools, and auto-grade inference engine
- Provides tight integration with NXP’s S32V processor family for streamlined ADAS development

NXP Semiconductors N.V. (NASDAQ:NXPI), the world’s largest provider of automotive semiconductors, has expanded its eIQ™ software machine learning (ML) development environment with its automotive-grade deep learning toolkit, eIQ Auto. The toolkit aims to help customers move quickly from a development environment to AI application implementations that meet stringent automotive standards. eIQ Auto enables the application of deep learning-based algorithms to vision, driver replacement, sensor fusion, driver monitoring and other evolving automotive applications.

The eIQ Auto toolkit allows customers to develop for automotive production on desktop/cloud/GPU environments and to deploy their neural network onto a supported S32 processor. NXP’s toolkit and automotive grade inference engine enable easier deployment of neural networks in applications with intensive safety requirements. A good example is speeding up the transition from traditional computer vision algorithms to deep learning-based algorithms in vision-based systems.

Deep Learning holds the promise of delivering better accuracy and better maintainability in object detection and classification over “traditional” computer vision algorithms, but the barriers to full automotive implementation bring complexity and steep costs.

The eIQ Auto toolkit aims to help customers reduce time to market by lowering the investment costs required to select and program embedded compute engines for each layer of a deep learning algorithm. The automated selection process leads to 30 times higher performance for given models compared to other embedded deep learning frameworks. This performance is achieved by optimizing the use of available resources and reducing time and development effort[1]. These dividends allow developers to evaluate, fine tune and deploy their applications for maximized overall performance.

Compliance with automotive-grade development standards and Functional Safety requirements are key benefits of eIQ Auto and S32V integration. eIQ Auto's inference engine was developed in accordance with stringent requirements and is Automotive SPICE® compliant. The S32V processors offer the highest levels of functional safety supporting ISO 26262 up to ASIL-C, IEC 61508, and DO 178.

"Next generation automotive applications, like those found in current Autonomous test vehicle implementations, are bulky, power hungry and impractical for volume automotive production," said Arnaud Van Den Bosche, Advanced Driver Assistance Solutions Manager at NXP. "The new eIQ toolkit helps our customers deploy powerful neural networks in an embedded processor environment with the highest levels of safety and reliability."

Together, NXP's eIQ Auto Deep Learning toolkit and automotive qualified S32V provide a strong foundation of performance, safety and quality for next generation automotive applications.

NXP eIQ Auto Toolkit Includes:

- Multiple execution options supported with unified API and runtime backend selection
- A-SPICE compliant inference engine that can optimize performance by scheduling tasks on the most efficient accelerator
- Support for state-of-the-art CNNs/Networks
- Library of optimized layers and networks

About eIQ Machine Learning Software
The NXP® eIQ™ machine learning software development environment enables the use of ML algorithms on NXP MCUs, i.MX RT crossover MCUs, and i.MX family SoCs. eIQ software and eIQ Auto toolkit include inference engines, neural network compilers, and optimized libraries.

Notes:
1 Based on Internal NXP benchmarks. Comparisons using single thread tensor flow tf lite model with floating point versus eIQ quantized version, running on dual apex 2 on S32V234