

SPS IPC Drives 2018, Hall 11

Artificial Intelligence for Simatic

- **New TM NPU module for the S7-1500 and ET 200MP with integral AI-capable chip: Intel Myriad X**
- **Evaluation of input data such as video, sound or CPU data by means of neural networks**
- **Use of machine-learning algorithms in production processes**
- **Efficient implementation of pick-and-place applications or quality checks on the basis of (human) expert knowledge**

Siemens is launching onto the market a new module for the Simatic S7-1500 controller and the ET 200MP I/O system, which has a chip with artificial intelligence (AI) capability: The S7-1500 TM NPU (neural processing unit) is equipped with the Intel Movidius Myriad X Vision processing unit, thus enabling the efficient processing of neural networks. The module gets its function from the provision of a trained neural system on an SD card and is equipped with the USB 3.1 interfaces and a Gigabit Ethernet port. On the basis of the neural network, data from a connected sensor system or from the CPU program can be processed. By using machine-learning algorithms, for example, visual quality checks in production plants or image-guided robot systems can be efficiently realized. This makes a considerably more efficient and more "human-like" behavior possible. With this module, Siemens is taking another step toward the integration of future technologies into industrial applications.

The installed VPU, Intel's new Myriad X VPU chip, is the first in its class to have a dedicated hardware accelerator for deep neural network structures. The integrated image processing unit together with the computing unit for neural networks makes the Myriad X the trailblazer for computer vision applications. The integral Intel chip facilitates new applications in industrial automation by speeding up the image-processing processes and fast local data evaluation by means of the trained models.

Users can connect compatible sensors such as cameras or microphones to the integrated interfaces of the newly developed S7-1500 TM NPU module. The data of the connected sensor systems, as well as information from the CPU program itself, can be processed using neural networks. The result of processing is then evaluated in the CPU program. Where the data of each workpiece must be configured most precisely for the recognition of workpieces using conventional image processing, this process can be structured with considerably more flexibility by applying learning procedures to identified image data. Open AI frameworks such as Tensorflow are used for this purpose.

The resulting advantage comes to bear, for example, during pick-and-place applications, in which a mobile robot must recognize, pick out and place components that are lying randomly in a crate. Added value can thus also be achieved during quality checks: Human expert knowledge regarding parameters such as consistency, color or quality of a product or a process can be transferred direct to the module through the continuous training of a neural network with assigned (image) data, e.g. by means of a connected camera.

Background information:

Artificial intelligence, with all its different facets, makes a considerable contribution, especially in industry, toward reducing the usual expense of programming and engineering, making the control logic more agile and flexible with regard to changes in the ambient conditions and structuring production processes with greater flexibility and precision.

With Future of Automation, Siemens is offering far-reaching insights into the future of automation and the role of artificial intelligence within the portfolio of Totally Integrated Automation. This means scalable solutions from the field level to the controller and edge level and all the way to the Cloud. This means that an AI solution can be scaled in terms of the environment and the target application: At the machine on the field level where fast, deterministic decisions are required, or across all machines or plants with a significantly higher quantity of data to be processed and a corresponding demand for computing power.



You will find this press release and a press photo at
www.siemens.com/press/PR2018110017DFEN

For further information, go to
siemens.com/et200mp

Further information about Siemens at SPS IPC Drives 2018 can be found at
www.siemens.com/sps-ipc-drives and www.siemens.com/press/sps2018

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