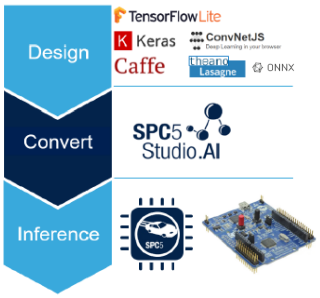
SPC5-STUDIO-AI

Data brief

Artificial Intelligence (AI) plugin for automotive SPC5 MCUs



Features

- Automatic conversion of pre-trained neural network into optimized Ansi C code, ready to be compiled
- Supports:
  - Keras
  - TensorFlow lite
  - Lasagne
  - Caffe
  - ConvNetJS
  - ONNX
- Provides neural network performance report and validation
- Integration with SPC5-STUDIO
- Full graphical conversion process: no "C" development skills required
- Supports SPC58 general purpose series:
  - Scalable product family with pin to pin compatibility across devices
  - Flash: up to 10 Mbyte
  - Connectivity: ethernet and CAN-FD
  - Safety: ASIL-B and ASIL-D capabilities
  - Security: Evita Full with HSM
- Evaluation boards available for fast evaluation

Product status link
SPC5-STUDIO-AI

Product label	
SPC5	SPC5 Studio

Application

- Vehicle security: network intrusion detection
- Electrification: battery management systems
- Virtual sensors
- Predictive maintenance

Description

SPC5-STUDIO-AI is the artificial intelligence (AI) plug-in of the SPC5-STUDIO development environment supporting the SPC58 general purpose series. It provides neural network architects a seamless way to generate, execute and validate pre-trained NN models on automotive MCUs.

SPC5-STUDIO-AI core functionality is the capability to automatically generate pre-trained neural network into an efficient “Ansi C” library that can be compiled, installed and executed on SPC58 general purpose series. Pre-trained neural networks can be easily imported by SPC5-STUDIO-AI from the most widely used deep learning frameworks, such as Keras, TensorFlow Lite, Lasagne, Caffe, ConvNetJS, ONNX.

Advanced embedded developers can import the library into more complex application specific projects, thanks to a well-defined short number of public APIs.

SPC5-STUDIO-AI provides validation and performance analysis facilities which allow to validate and characterize the converted neural network and measure key metrics such as validation error, memory requirements (i.e. Flash and RAM) and execution time. This plugin is integrated within SPC5-STUDIO (version 6.0.0 or higher) development environment available on www.st.com/spc5studio

1 Easy development flow

Figure 1. **Development flow**

Revision history

Table 1. **Document revision history**

Date	Version	Changes
15-Jul-2020	1	Initial release.
21-Oct-2020	2	Added support for ONNX Neural Network.