

1 Overview

This document contains information about the content, new features, and limitations of the eIQ Toolkit package. eIQ Toolkit is a machine learning environment which enables its users to train and run machine learning models as efficiently as possible on NXP hardware.

Contents

- 1 Overview..... 1
- 2 References..... 1
- 3 New features..... 1
- 4 Known issues and workarounds..... 2
- 5 Revision history..... 2

Table 1. Component overview

| Component name | Version |
|-----------------------------------|---------|
| eIQ Portal | 2.4.8 |
| eIQ Model Tool | 2.4.2 |
| DeepView Converter | 2.5.12 |
| DeepViewRT | 2.4.38 |
| DeepView Trainer (Trainer-server) | 2.4.3 |
| DeepView Validator | 2.3.12 |
| Modelrunner | 2.1.16 |
| DeepView Importer | 2.1.15 |
| DeepView Datastore | 2.1.15 |
| Python | 3.8.10 |
| Python – Tensorflow | 2.5.0 |
| Python – ONNX | 1.11.0 |

2 References

This release includes the following references and additional information:

- *eIQ Toolkit User's Guide* (document EIQTUG) - provides the information about the eIQ Toolkit.
- *eIQ Toolkit Release Notes* (document EIQTRN) - provides the release information.
- *DeepViewRT User's Manual* - provides the information about DeepViewRT inference engine.
- *Datastore User's Manual* - provides the information about Datastore API for dataset management.
- *Custom Models Note* - provides the information about creating custom models for image-classification and object-detection problems.

3 New features

The current release focuses mainly on bug fixing:



- Python examples were added to the `<install_dir>/deepviewrt/deepview-rt-python-examples` directory, which demonstrates how to use the "deepviewrt" inference engine to classify and detect images.
- Jupyter notebooks to measure accuracy metrics for classification and object detections were added to `<install_dir>/workspace/validator`.
- Options to display the "mAP" (and generally accuracy metrics) during training of object-detection models were added.
- The image validation for object detection was added into the DeepView Validator.
- A CIFAR10-based CNN example to demonstrate the custom model API was added to `<install_dir>/workspace/user_models`.
- A significant number of minor bugs was fixed, such as:
 - Mobilenet conversions from ONNX to TF Lite generating a huge number of nodes
 - Mobilenet v3 SSD training convergence on COCO dataset
 - Device selection during model validation
 - GUI defects and improved GUI usage
 - Other minor fixes

4 Known issues and workarounds

The following list specifies the currently known issues (which may impact the user experience) and workarounds:

- If training a detection model without test images, disable the evaluation in the "Evaluation Settings" sidebar on the "Trainer" screen.
- The validation may not work when the proxy settings are enabled.
- Issues were observed for the ONNX to TFLite conversions due to differences between the two formats and 3rd party library usage. Significant improvements were introduced since the last version. Specifically, this applies to models originating from PyTorch.
- Issues were observed for the H5/TF Lite to ONNX conversions due to differences between the two formats and 3rd party library usage.
- Issues were observed in quantized conversions using the TF SavedModel format.
- The file browser does not open documentation from the eIQ Portal/Model Tool on Ubuntu 20.04. Navigate to `<install_dir>/docs` manually.
- Conversion from TensorFlow 1.x Pb to RTM with the quantization enabled does not work using the Model Tool. However, it works using the "deepview-converter command-line" tool with the "--quantize" parameter.

5 Revision history

Table 2. Revision history

| Revision number | Date | Substantive changes |
|-----------------|-----------------|---------------------|
| 0 | 9 June 2021 | eIQ Toolkit 1.0.3 |
| 1 | 24 June 2021 | eIQ Toolkit 1.0.5 |
| 2 | 19 October 2021 | eIQ Toolkit 1.1.8 |
| 3 | 18 January 2022 | eIQ Toolkit 1.2.5 |
| 4 | 31 March 2022 | eIQ Toolkit 1.3.4 |

How To Reach Us

Home Page:

nxp.com

Web Support:

nxp.com/support

Limited warranty and liability — Information in this document is provided solely to enable system and software implementers to use NXP products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits based on the information in this document. NXP reserves the right to make changes without further notice to any products herein.

NXP makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does NXP assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in NXP data sheets and/or specifications can and do vary in different applications, and actual performance may vary over time. All operating parameters, including "typicals," must be validated for each customer application by customer's technical experts. NXP does not convey any license under its patent rights nor the rights of others. NXP sells products pursuant to standard terms and conditions of sale, which can be found at the following address: nxp.com/SalesTermsandConditions.

Right to make changes - NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Security — Customer understands that all NXP products may be subject to unidentified or documented vulnerabilities. Customer is responsible for the design and operation of its applications and products throughout their lifecycles to reduce the effect of these vulnerabilities on customer's applications and products. Customer's responsibility also extends to other open and/or proprietary technologies supported by NXP products for use in customer's applications. NXP accepts no liability for any vulnerability. Customer should regularly check security updates from NXP and follow up appropriately. Customer shall select products with security features that best meet rules, regulations, and standards of the intended application and make the ultimate design decisions regarding its products and is solely responsible for compliance with all legal, regulatory, and security related requirements concerning its products, regardless of any information or support that may be provided by NXP. NXP has a Product Security Incident Response Team (PSIRT) (reachable at PSIRT@nxp.com) that manages the investigation, reporting, and solution release to security vulnerabilities of NXP products.

NXP, the NXP logo, NXP SECURE CONNECTIONS FOR A SMARTER WORLD, COOLFLUX, EMBRACE, GREENCHIP, HITAG, ICODE, JCOP, LIFE, VIBES, MIFARE, MIFARE CLASSIC, MIFARE DESFire, MIFARE PLUS, MIFARE FLEX, MANTIS, MIFARE ULTRALIGHT, MIFARE4MOBILE, MIGLO, NTAG, ROADLINK, SMARTLX, SMARTMX, STARPLUG, TOPFET, TRENCHMOS, UCODE, Freescale, the Freescale logo, AltiVec, CodeWarrior, ColdFire, ColdFire+, the Energy Efficient Solutions logo, Kinetis, Layerscape, MagniV, mobileGT, PEG, PowerQUICC, Processor Expert, QorIQ, QorIQ Qonverge, SafeAssure, the SafeAssure logo, StarCore, Symphony, VortiQa, Vybrid, Airfast, BeeKit, BeeStack, CoreNet, Flexis, MXC, Platform in a Package, QUICC Engine, Tower, TurboLink, EdgeScale, EdgeLock, eIQ, and Immersive3D are trademarks of NXP B.V. All other product or service names are the property of their respective owners. AMBA, Arm, Arm7, Arm7TDMI, Arm9, Arm11, Artisan, big.LITTLE, Cordio, CoreLink, CoreSight, Cortex, DesignStart, DynamIQ, Jazelle, Keil, Mali, Mbed, Mbed Enabled, NEON, POP, RealView, SecurCore, Socrates, Thumb, TrustZone, ULINK, ULINK2, ULINK-ME, ULINK-PLUS, ULINKpro, μ Vision, Versatile are trademarks or registered trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere. The related technology may be protected by any or all of patents, copyrights, designs and trade secrets. All rights reserved. Oracle and Java are registered trademarks of Oracle and/or its affiliates. The Power Architecture and Power.org word marks and the Power and Power.org logos and related marks are trademarks and service marks licensed by Power.org. M, M Mobileye and other Mobileye trademarks or logos appearing herein are trademarks of Mobileye Vision Technologies Ltd. in the United States, the EU and/or other jurisdictions.

© NXP B.V. 2022.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 31 March 2022

Document identifier: EIQTRN