Triton Smart Quick Start Guide

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Ver. 1.2

Introduction

This document describes how to get started using the LUCID Triton Smart camera (TRS123S-CC) together with Neurala Brain Builder software and ArenaView MP.

Preparation

You should have installed or readied the software and files as described below. Unless otherwise stated, all required files can be obtained from the Triton Smart product page.

Program/file	Purpose	Directions
ArenaView MP	Loading AI-related files on to the Triton Smart, and viewing inference results.	Follow the directions below to install ArenaView MP. ArenaView MP is currently available for Windows only and is tested for use exclusively with the Triton Smart.
Triton Smart example software package	Utilities and sample programs for the Triton Smart.	Contains C++ and Python code examples for the Triton Smart, as well as example AI models. Also includes sensor firmware.
Brain Builder (Basic Edition)	Train and export AI models for the Triton Smart.	Ensure that this is installed and licensed as described on the Triton Smart product page. Note: Brain Builder is not obtained from the LUCID website.
CodeMeter	License manager for Brain Builder.	This will be installed when you follow the steps for installing Brain Builder as described on the Triton Smart product page. Note: CodeMeter is not obtained from the LUCID website.

Workflow

A typical workflow for training and using the Triton Smart is shown below.

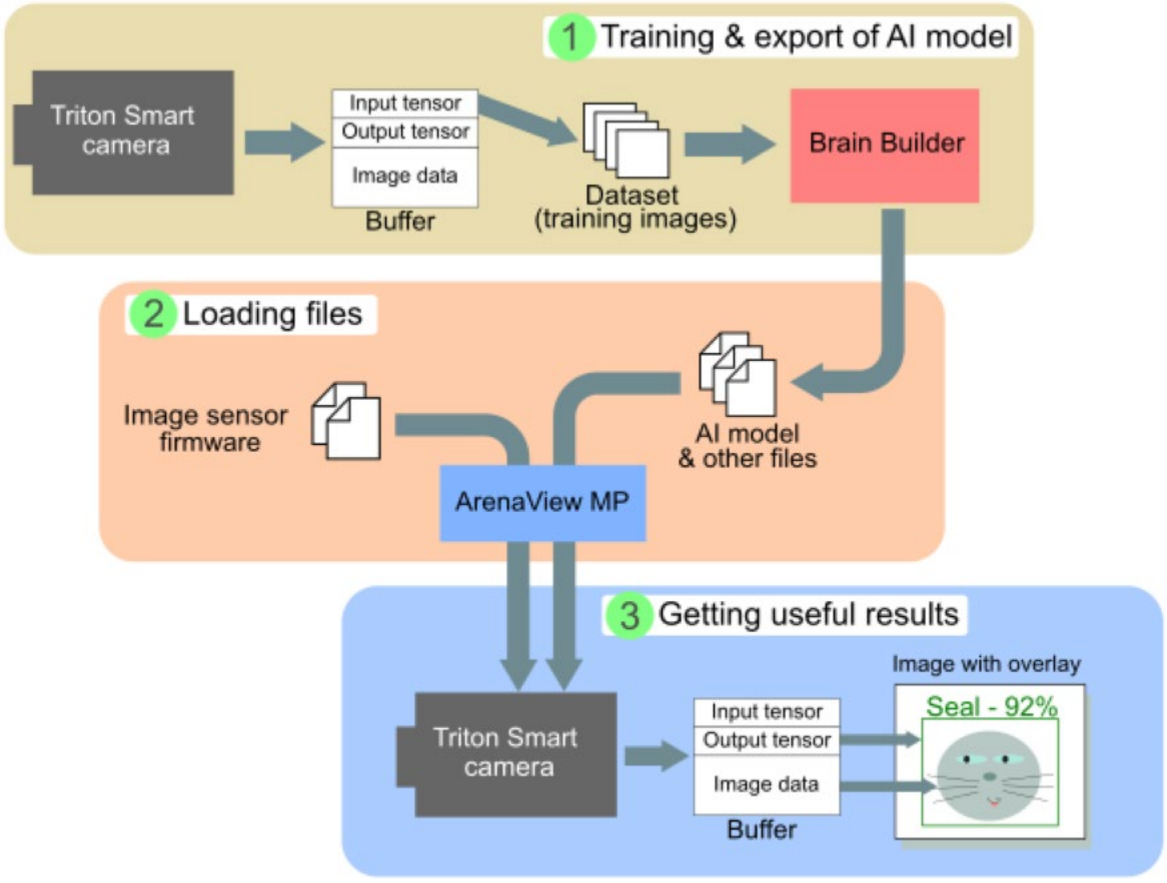


Figure 1: Workflow for training and using the Triton Smart.

1. Starting with a Triton Smart prepared for use (see the “Preparing the camera” section below), capture images of the items of interest with the Triton Smart, and save the *input tensors*, which are downsampled images that are processed by the Triton Smart’s AI engine. Use the input tensors to train an AI model in Brain Builder, and then export it.
2. Next, use ArenaView MP to convert the AI model for use with the IMX501 Intelligent Vision Sensor, and upload the AI model files to a Triton Smart along with firmware for the image sensor.
3. Load the AI model on the camera and enable it. The Triton Smart will analyze captured images in its AI engine and provide the results of this analysis in its chunk data along with the image data.

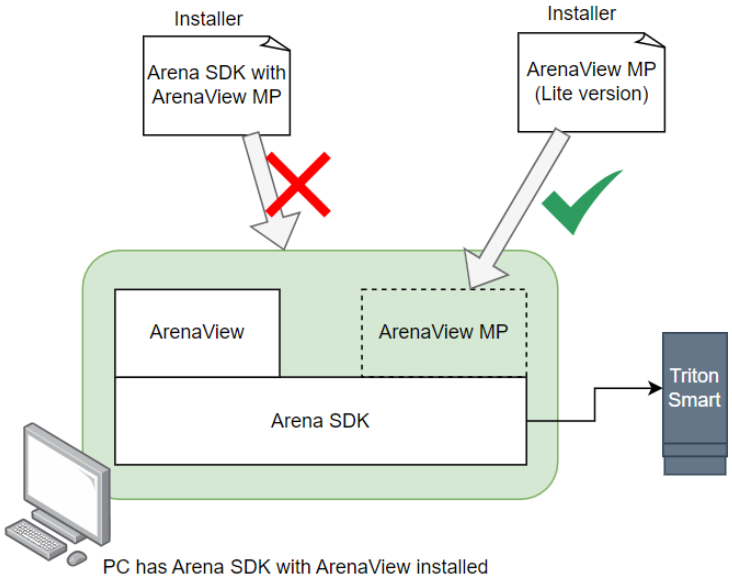
The analysis results, which are known as the output tensor, is visualized in ArenaView MP as an overlay on the image, and they can be captured via your own code using the Arena SDK.

Installing ArenaView MP

In Windows, run the ArenaView MP installation package. Be sure to run the installer with Developer options.

You cannot install the “Arena SDK with ArenaView MP” package if you already have the Arena SDK with ArenaView installed.

However, if you have the Arena SDK with ArenaView installed, you can install the Lite version of ArenaView MP.



ArenaView MP documentation

To use AVMP configure and control the Triton Smart see the SDK documentation that that is installed with the Arena SDK.

Getting ready to train an AI model

Though you can train an AI model using higher-resolution images from the Triton Smart or another camera, you can achieve the highest accuracy by training with the input tensors captured from the Triton Smart under the actual optical and lighting conditions for your application.

Preparing the camera

The Triton Smart requires an AI model to be loaded before it can produce an input tensor.

The input tensor characteristics depend on the type of AI model that is loaded. The Classifier AI model uses a 256x256 pixel input tensor. The Detector AI model uses a 320x320 pixel input tensor.

Use ArenaView MP to upload an AI model of the same type that you want to train (e.g., object detection or classification). You can use one of the pre-trained AI models in the Triton Smart example software package. See the SDK documentation for how to upload the AI model to the camera.

Capturing input tensors on the Triton Smart

The Disp_InputTensor.exe Windows utility can be found on the Triton Smart example package.

To capture input tensors for training purposes:

1. Connect the Triton Smart to the host computer and run Disp_InputTensor.exe.
2. In the window that appears, click the Save icon to save images. Images will appear in the same folder as Disp_InputTensor.exe. These images can be used to train an AI model in Brain Builder.

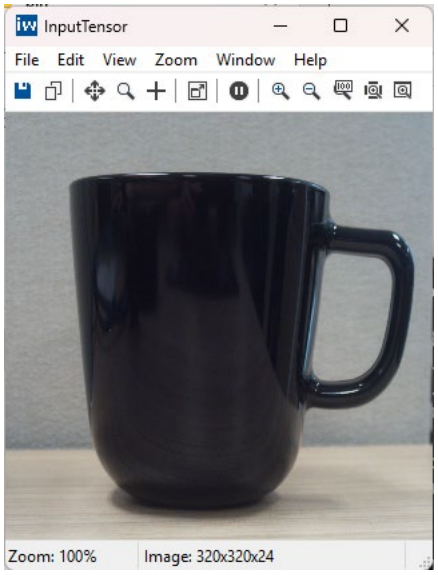


Figure 2: Disp_InputTensor.exe utility in action.

Training an AI model using Brain Builder

Use the Basic edition of Brain Builder to train an AI model using the dataset of input tensor images, and then export this AI model.

Refer to the documentation on Brain Builder for AITRIOS for how use Brain Builder.

The types of models available with the Basic edition of Brain Builder are:

- Classifier
- Object detection

Troubleshooting

If you have any problems, contact LUCID Support (Support and Returns Portal - LUCID Vision Labs).