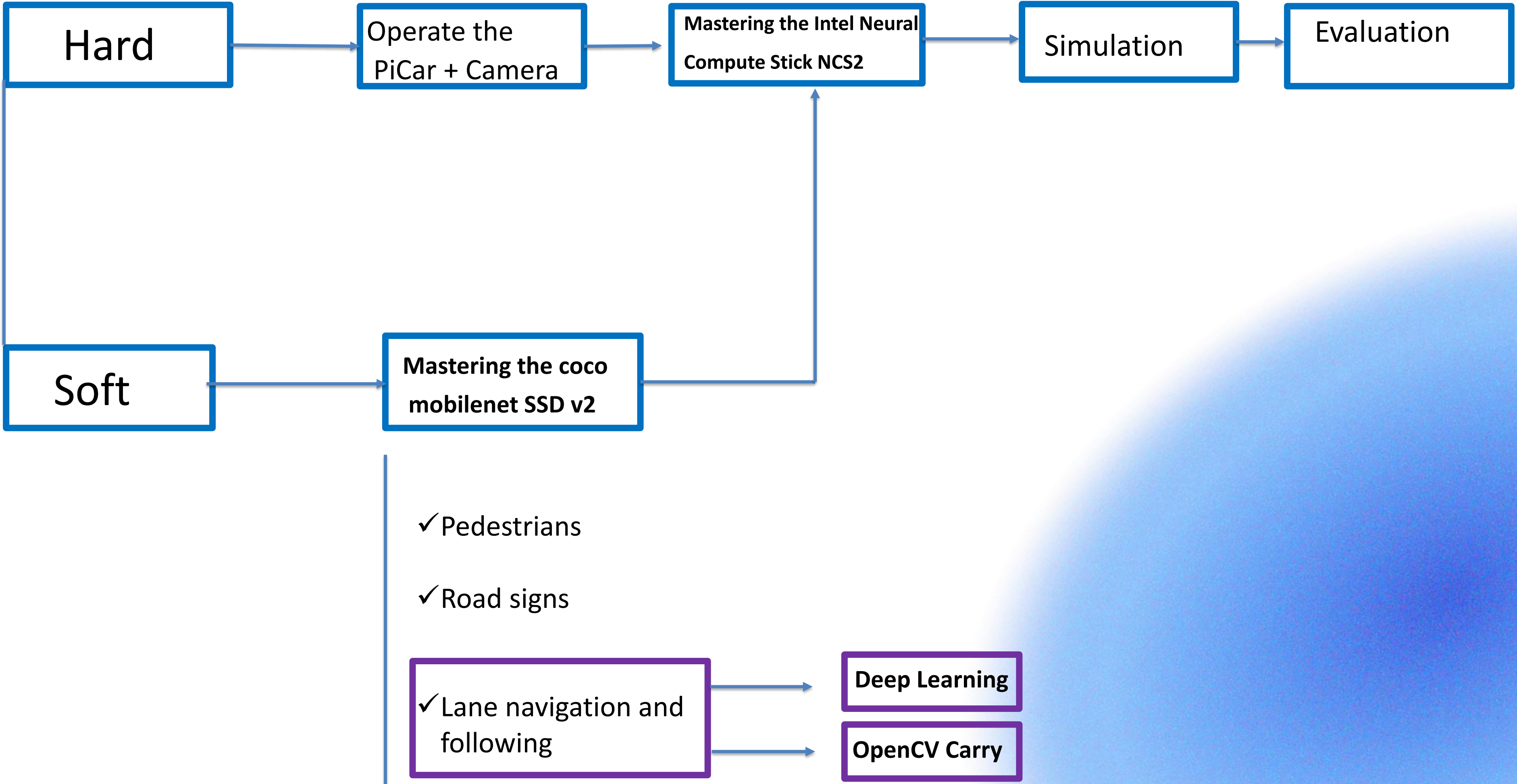
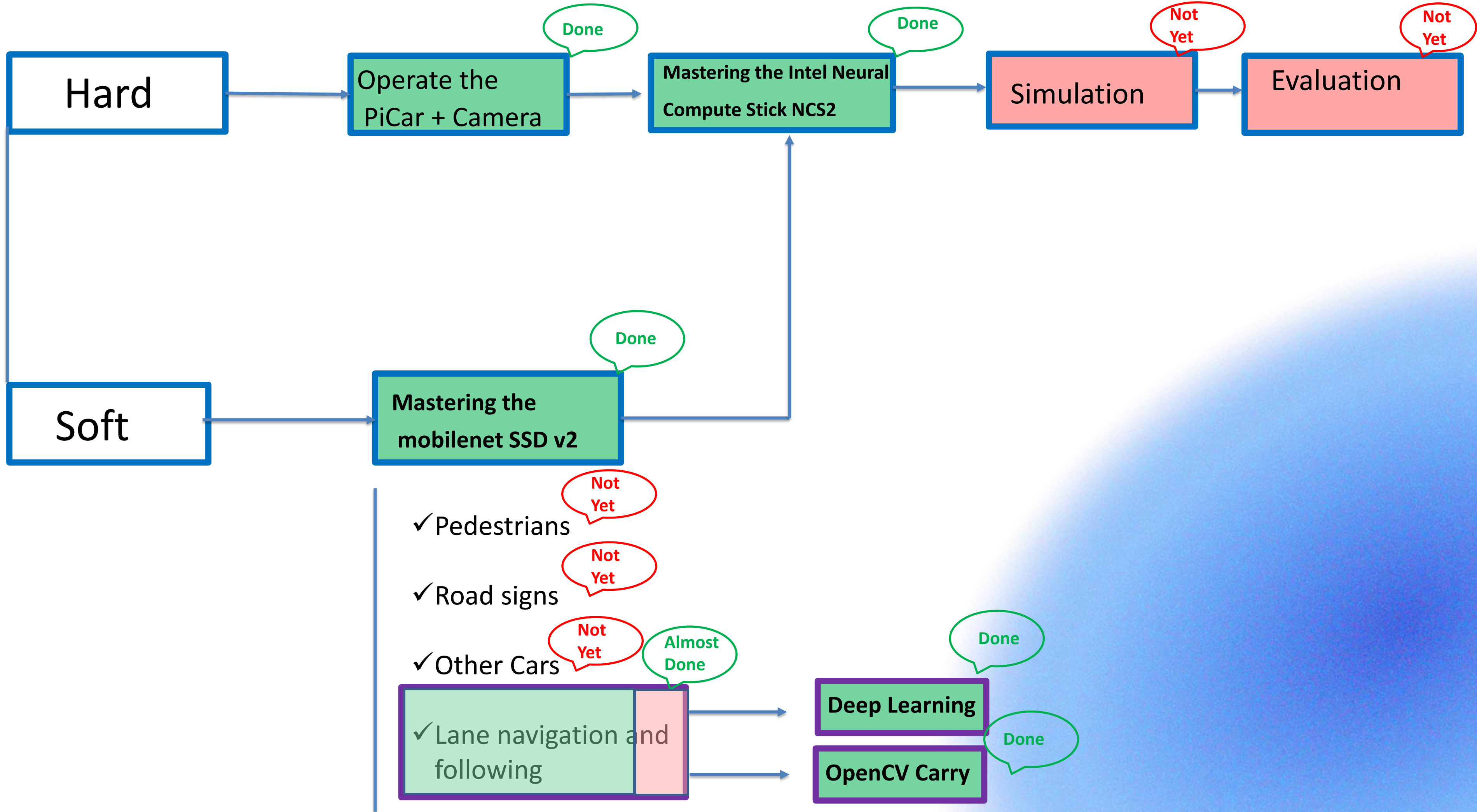


Our Project's Timeline



The Previous work



The Current work

Convert our Deep Learning model to the .bin and .xml Intermediate Representation (IR) files to run them over the NCS2 and RPI3 :

After generation the deep learning model for autonomous lane navigation (Lane_navigation_finale.h5 and Lane_navigation_check.h5)

We will use intel's **DL Workbench** that converts Keras H5 models to the Saved Model format and then to the OpenVINO™ format (XML and BIN files) with the Model Optimizer.

The inference can then be run in the VPU of the neural compute stick and the Raspberry Pi3

DL Workbench combines OpenVINO™ tools to assist you with the most commonly used tasks: import a model, analyze its performance and accuracy, visualize the outputs, optimize and prepare the model for deployment in a matter of minutes.



Import a model

Perform baseline inference

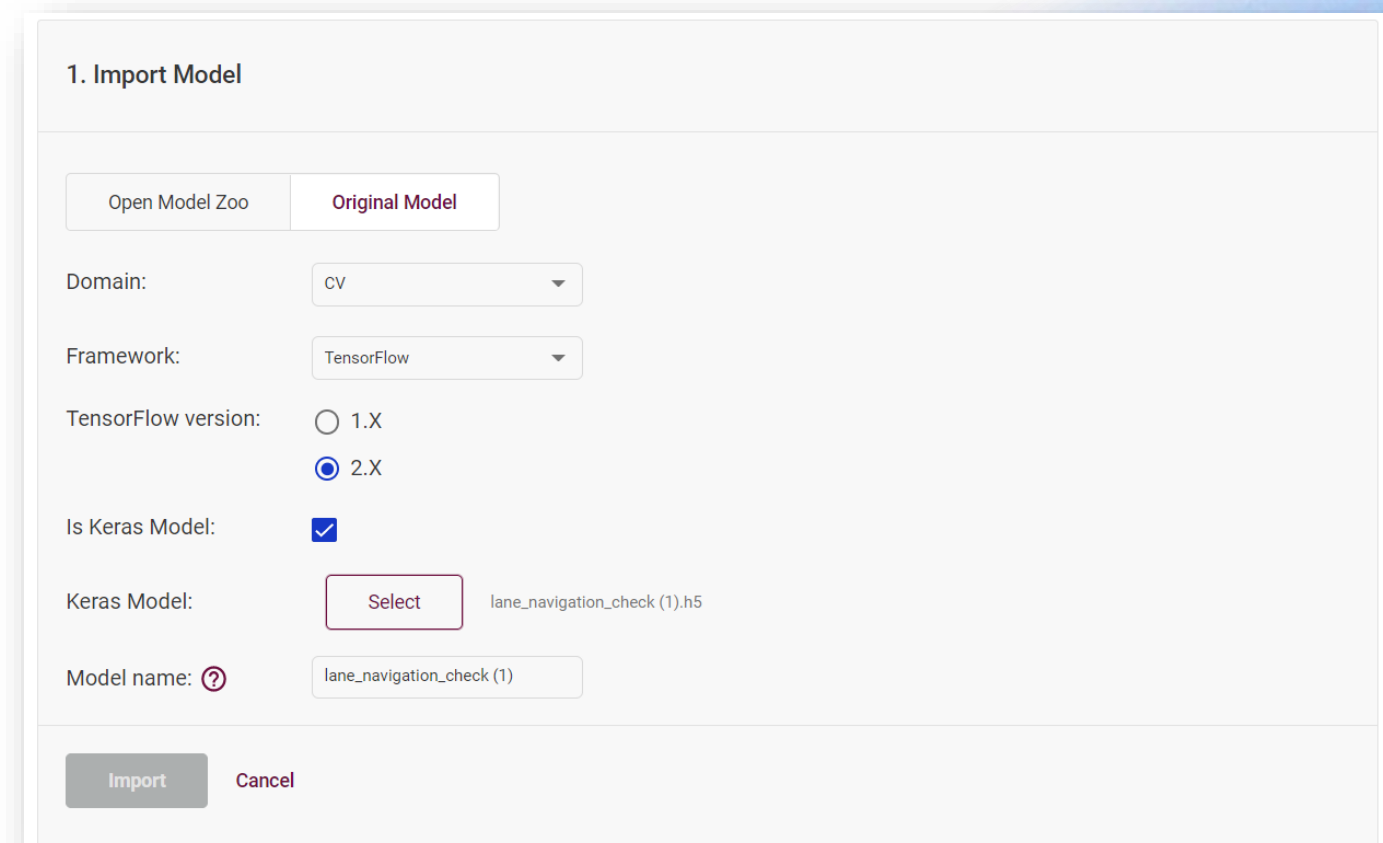
1) Upload Original Models:

In the DL Workbench, you can upload original models stored on your operating system. TensorFlow 2.0 models can be in SavedModel and Keras H5 format:

- SavedModel is an official and recommended format for imported models.
- Keras H5 format is available for Keras models with a TensorFlow 2 backend and not with a Keras backend. Model Optimizer does not support Keras H5 models, so the DL Workbench converts Keras H5 models to the Saved Model format and then to the OpenVINO™ format with the Model Optimizer.

To import a TensorFlow 2.0 model in Keras format:

- 1.Select the framework in the drop-down list.
 - 2.Choose the **TensorFlow 2.x** version.
 - 3.Check the **Is Keras Model** box.
 - 4.Upload an .h5 file with your model.
 - 5.Provide the name.
- Click **Import**.



1. Import Model

Open Model Zoo Original Model

Domain: CV

Framework: TensorFlow

TensorFlow version: ☐ 1.X ☒ 2.X

Is Keras Model: ☒

Keras Model: Select lane_navigation_check (1).h5

Model name: ? lane_navigation_check (1)

Import Cancel

2) Prepare Environment:

At the **Prepare Environment** stage, the DL Workbench installs the necessary packages to work with the model framework. For each framework, the download happens only once and takes from two to five minutes. If the environment setup is successful, you will automatically proceed to the next step

2. Prepare Environment

Status: ✓

Wait for this task to be completed. If you reload or leave this page, the task could be canceled or fail.

3) Convert Models to Intermediate Representation (IR):

To work with OpenVINO tools, you need to obtain a model in the Intermediate Representation (IR) format. IR is the OpenVINO format of pre-trained model representation with two files:

- XML file describing the network topology
- BIN file containing weights and biases

3. Convert Model to IR - General Parameters

① Settings to convert model to OpenVINO format (Intermediate Representation)

② Precision: [Learn More](#)

② Original Color Space: [Learn More](#)

Configuration Files

② Use pipeline config file: ☐

② Use Model Conversion Configuration File: ☐

Inputs

Specify Inputs (Optional): ☐

Specify the input shapes of your model or skip this option and the DL Workbench will detect the inputs automatically.

Advanced Parameters

② Override Outputs: ☐

4) Configure Model Inputs:

If the conversion step is completed successfully, you will obtain a model in the IR format.

However, to use it in the **OpenVINO** tools (for example, benchmark the model, optimize it, and measure accuracy), you need to specify model layouts.

The role of dimensions may differ depending on the model and the way the data was fed to the model during training. Usually, **NCHW** is used for ONNX models, and NHWC for TensorFlow models. If you want to specify different dimension roles, select Custom.

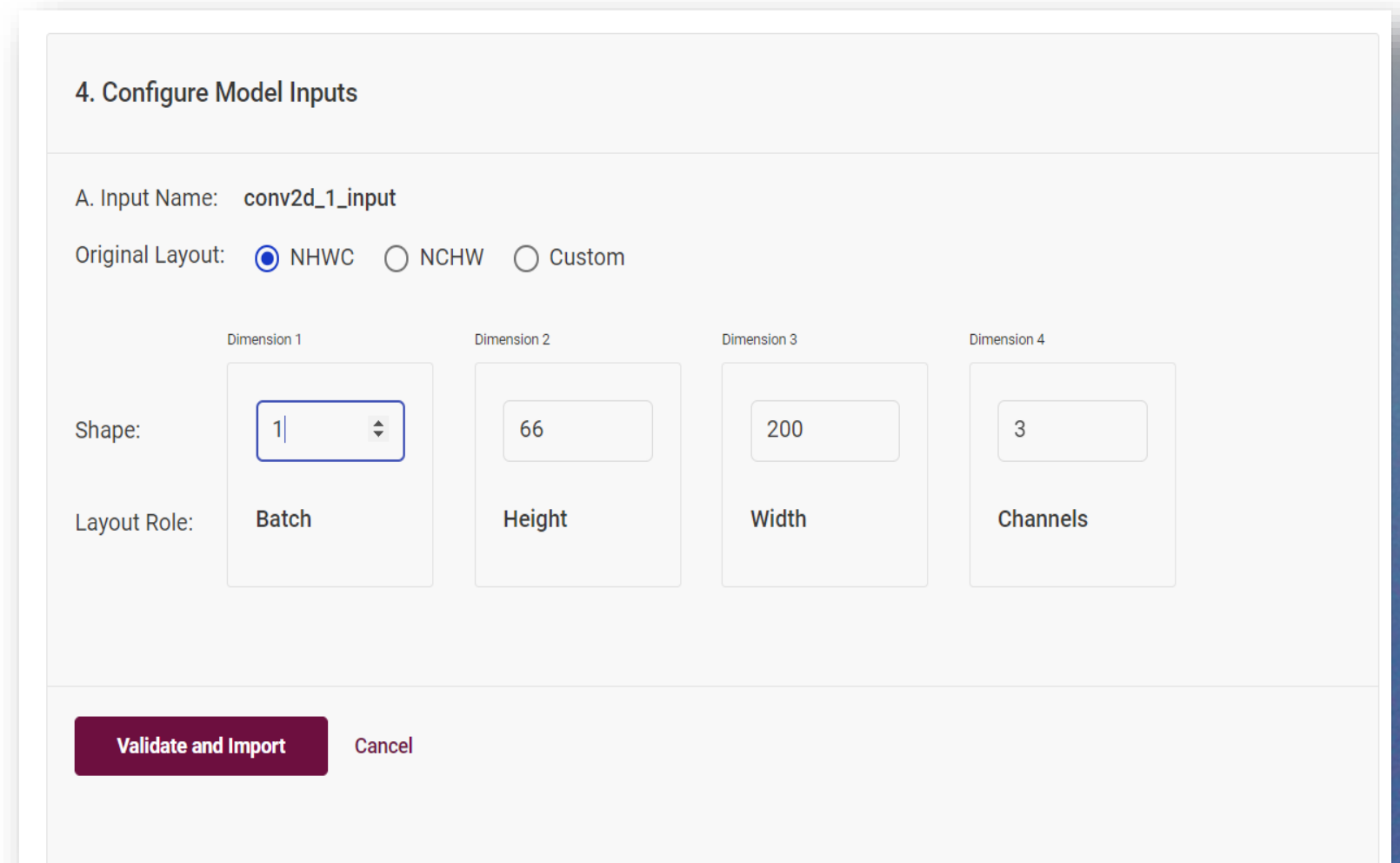
Batch -> Number of image samples in the batch (input image)

Height -> Image height

Width -> Image width

Channels -> Number of image channels (3 for RGB/BGR, 1 for Grayscale)

In our case we have as input one image 200x66 and the color space is YUV.



4. Configure Model Inputs

A. Input Name: conv2d_1_input

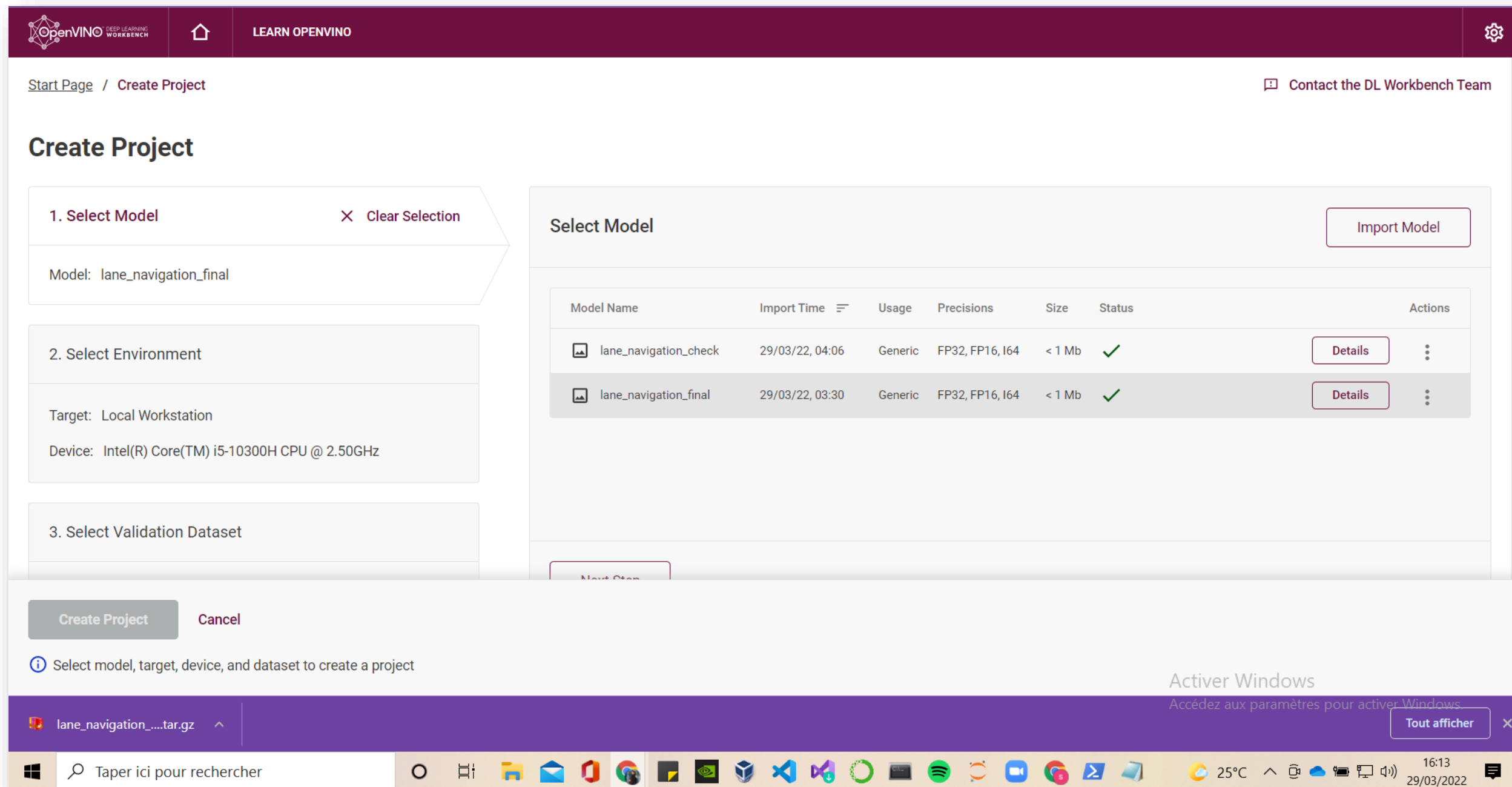
Original Layout: ☒ NHWC ☐ NCHW ☐ Custom

	Dimension 1	Dimension 2	Dimension 3	Dimension 4
Shape:	1	66	200	3
Layout Role:	Batch	Height	Width	Channels

Validate and Import Cancel

5) Download Converted Model:

The IR conversion of the model is a compressed file .tar.gz that contains the two files .xml et .bin ,



Create Project

1. Select Model ✕ Clear Selection

Model: lane_navigation_final



2. Select Environment

Target: Local Workstation

Device: Intel(R) Core(TM) i5-10300H CPU @ 2.50GHz

3. Select Validation Dataset

Select Model Import Model

Model Name	Import Time	Usage	Precisions	Size	Status	Actions
 lane_navigation_check	29/03/22, 04:06	Generic	FP32, FP16, I64	< 1 Mb	✓	Details ⋮
 lane_navigation_final	29/03/22, 03:30	Generic	FP32, FP16, I64	< 1 Mb	✓	Details ⋮

Create Project Cancel

i Select model, target, device, and dataset to create a project

lane_navigation_....tar.gz

Activer Windows
Accédez aux paramètres pour activer Windows.

Tout afficher

Taper ici pour rechercher

25°C 16:13 29/03/2022