RKNN Installation

> **TIP**
>
> This document aims to demonstrate how to install the RKNN SDK. For more information, please refer to the RKNN Toolkit2 repository doc directory.

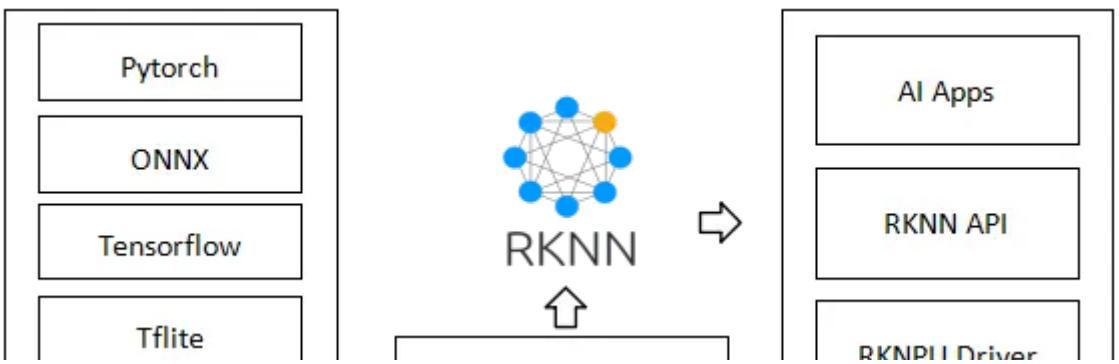
Introduction to RKNN

Rockchip RK3566/RK3568 series, RK3588 series, K3562 series, RV1103/RV1106 series chips are equipped with a neural network processor (NPU). Using RKNN, users can quickly deploy AI models to Rockchip chips for NPU hardware-accelerated inference. To use RKNPU, users need to first use the RKNN-Toolkit2 tool on an x86 computer to convert the trained model into the RKNN format, and then use the RKNN C API or Python API for inference on the development board.

Required Tools:

- RKNN-Toolkit2 is a software development kit for users to perform model conversion, inference, and performance evaluation on PC and Rockchip NPU platforms.
- RKNN-Toolkit-Lite2 provides a Python programming interface for Rockchip NPU platforms, helping users deploy RKNN models and accelerate AI applications.
- RKNN Runtime provides C/C++ programming interfaces for Rockchip NPU platforms, helping users deploy RKNN models and accelerate AI applications.
- RKNPU kernel driver is responsible for interacting with the NPU hardware.

The overall framework is as follows:



Set up the RKNN Environment

Configure RKNN-Toolkit2 Environment on PC

- Download the RKNN Repository

  It is recommended to create a directory to store the RKNN repository. For example, create a folder named Projects and place the RKNN-Toolkit2 and RKNN Model Zoo repositories under this directory. The commands are as follows:

  ```
  # Create Projects folder
  mkdir Projects
  cd Projects

  # Download RKNN-Toolkit2 repository
  git clone https://github.com/airockchip/rknn-toolkit2.git

  # Download RKNN Model Zoo repository
  git clone https://github.com/airockchip/rknn_model_zoo.git
  ```

- (Optional) Install Anaconda

  If Python 3.8 (recommended version) is not installed in the system, or if there are multiple Python environments installed simultaneously, it is recommended to use Anaconda to create a new Python 3.8 environment.

  - Install Anaconda

    Execute the following command in the computer's terminal window to check if Anaconda is installed. If Anaconda is already installed, this step can be skipped.

    ```
    $ conda --version
    conda 23.10.0
    ```

If "conda: command not found" appears, it means Anaconda is not installed. Please refer to the Anaconda official website for installation.

- Create a conda environment

```
conda create -n rknn python=3.8
```

- Activate the conda environment

```
conda activate rknn
```

- Deactivate the environment

```
conda deactivate
```

Install Dependencies and RKNN-Toolkit2 on PC

- After activating the conda rknn environment, navigate to the rknn-toolkit2 directory and install dependencies libraries based on your Python version by selecting the corresponding requirements_cpXX.txt file. Then install RKNN-Toolkit2 using the wheel package. The commands are as follows:

```
# Navigate to the rknn-toolkit2 directory
cd Projects/rknn-toolkit2/rknn-toolkit2
# Choose the appropriate requirements file according to your python version
pip install -r packages/requirements_cp38-1.6.0.txt -i https://
mirror.baidu.com/pypi/simple
# Choose the appropriate wheel package file according to your python version
and processor architecture:
pip install packages/rknn_toolkit2-1.6.0+81f21f4d-cp38-cp38-linux_x86_64.whl
```

- Verify if the installation is successful

  Execute the following command. If no errors occur, it means that the RKNN-Toolkit2 environment is successfully installed.

Install RKNN Toolkit Lite2 and Its Dependencies on the

Bo

```
$ python3
>>> from rknn.api import RKNN
```

> **INFO**
>
> Radxa official image has RKNPU2 and its dependencies installed by default. Only python3-rknnlite2 needs to be installed. If it doesn't work, try to comment out the command.

```
sudo apt update
sudo apt install python3-rknnlite2
# sudo apt install rknpu2-rk3588   # For SOC RK3588 series
# sudo apt install rknpu2-rk356x   # For SOC RK356X series
```

If you are using the CLI version, you can visit the RKNN Toolkit Lite2 deb package download page.

(Optional) Install RKNN Model Zoo on the Board

```
# Download the RKNN Model Zoo repository
git clone https://github.com/airockchip/rknn_model_zoo.git
```