2. **Industrial Camera Inspection System (Embedded Machine Vision):**
This System offers more compact solution to detect pharmaceutical tablet defects using deep learning. Its hardware is composed of a NVIDIA Jetson Nano as the processing unit, Raspberry Pi HQ camera as the main image capturing device, an I/O board for receiving camera triggers and sending rejection signals, a 12V 5A power supply and lights made out of LED strips for proper image exposure. The software portion of the system is consisting of a Convolutional Neural Network (CNN). The network is trained with about thousands of images. After training the neural network learns to distinguish between good and defective tablets. While the packaging machine is running the system will receive camera trigger via I/O board, take a snap of the Area of Interest (AOI), feed it in the CNN, find a decision and finally feed the decision to packaging machine via the I/O board.

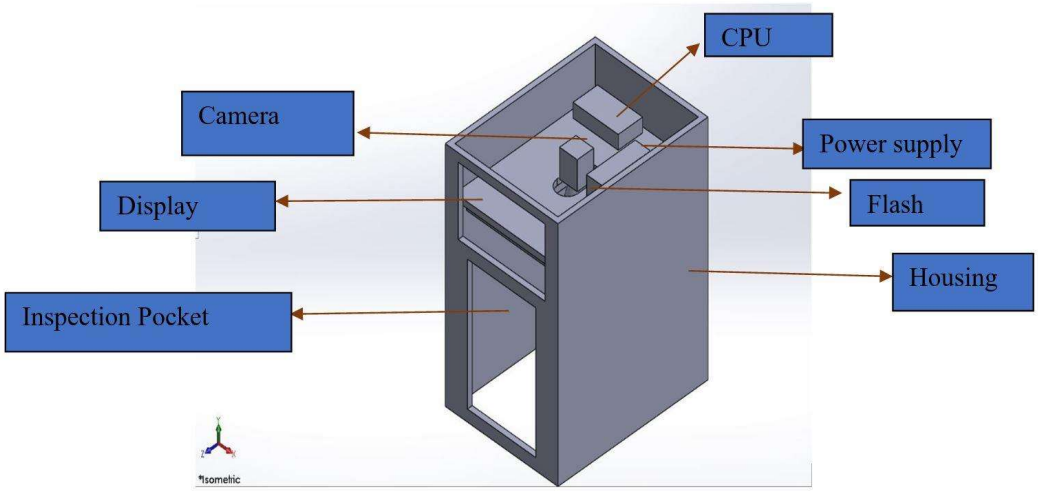

Fig: Hardware setup of camera inspection system

For operation of the system 3 steps needs to be followed:

Step 1: Data Preparation

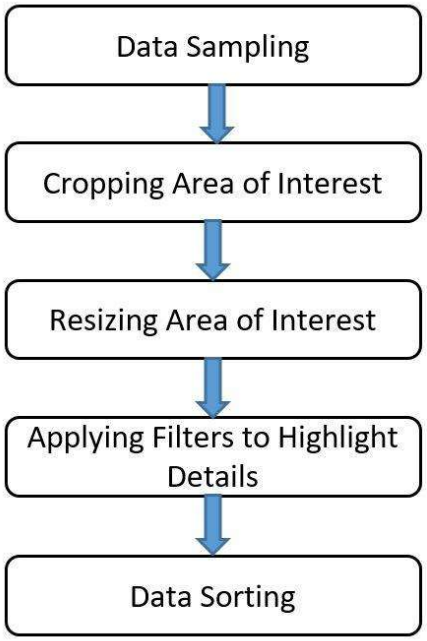

Fig: Data Preparation Flow Chart

Step 2: Model Creation, Training & Saving

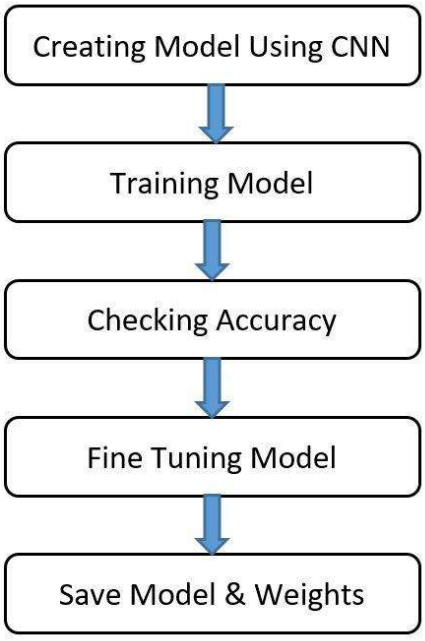

Fig: Model Preperation Flow Chart

Step 3: Application

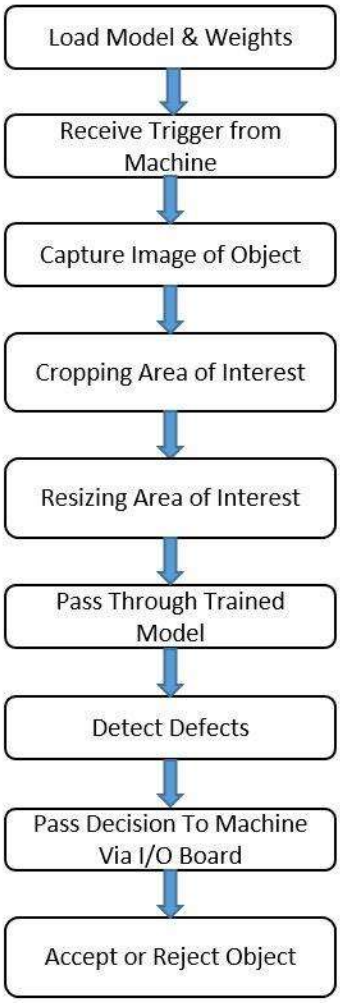

Fig: Application Flow Chart

Fig: Final Fabricated Hardware

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