# Running the Kerberos SDR Training Model

## Initial set up for a new environment:

1. Install Python 3
2. Install pip3
3. Ensure system architecture, OS, and TensorFlow package 1.14.0 are compatible with each other
   1. try running

sudo pip3 install tensorflow=1.14.0

1. Install Docker
2. Clone the cnn-kerberos git repository locally
   1. run:

git clone https://github.com/marcella-benner/cnn-kerberossdr

1. Build the Docker images
   1. Build the **prep** image:
      1. run:

cd /home/pi/cnn-kerberossdr/docker\_images/docker\_prep

* + 1. run:

sudo docker build . -t prep:latest

* 1. Build the **train** image:
     1. run:

cd /home/pi/cnn-kerberossdr/docker\_images/docker\_train

* + 1. run:

sudo docker build . -t train:latest

* 1. Build the **predict** image:
     1. run:

cd /home/pi/cnn-kerberossdr/docker\_images/docker\_predict

* + 1. run:

sudo docker build . -t predict:latest

1. Make sure all signal classes of interest have folders
   1. run:

cd /home/pi/cnn-kerberossdr/setup\_scripts

* 1. edit the directories that are made in the training and testing folders so that a directory for every signal class (and “other”) is made.

## Running the Model

1. Take note of image IDs
   1. run

sudo docker images

1. Ensure the SDR device is plugged in
2. Prepare the data
   1. run the following by inserting the proper image ID for **prep**  
      (may change according to signal classes and system directory structure):

sudo docker run -it --privileged -v /dev/bus/usb:/dev/bus/usb -v /home/pi/cnn-kerberossdr/training\_data/lora:/home/classifier/cnn-kerberossdr/training\_data/lora -v /home/pi/cnn-kerberossdr/training\_data/sigfox:/home/classifier/cnn-kerberossdr/training\_data/sigfox -v /home/pi/cnn-kerberossdr/training\_data/zwave:/home/classifier/cnn-kerberossdr/training\_data/zwave -v /home/pi/cnn-kerberossdr/training\_data/other:/home/classifier/cnn-kerberossdr/training\_data/other -v /home/pi/cnn-kerberossdr/testing\_data/lora:/home/classifier/cnn-kerberossdr/testing\_data/lora -v /home/pi/cnn-kerberossdr/testing\_data/sigfox:/home/classifier/cnn-kerberossdr/testing\_data/sigfox -v /home/pi/cnn-kerberossdr/testing\_data/zwave:/home/classifier/cnn-kerberossdr/testing\_data/zwave -v /home/pi/cnn-kerberossdr/testing\_data/other:/home/classifier/cnn-kerberossdr/testing\_data/other [ImageID]

1. Train the data
   1. run the following by inserting the proper image ID for **train**

sudo docker run -it --privileged -v /dev/bus/usb:/dev/bus/usb

-v /home/pi/cnn-kerberossdr/training\_data/lora:/home/classifier/cnn-kerberossdr/training\_data/lora

-v /home/pi/cnn-kerberossdr/training\_data/sigfox:/home/classifier/cnn-kerberossdr/training\_data/sigfox

-v /home/pi/cnn-kerberossdr/training\_data/zwave:/home/classifier/cnn-kerberossdr/training\_data/zwave

-v /home/pi/cnn-kerberossdr/training\_data/other:/home/classifier/cnn-kerberossdr/training\_data/other

-v /home/pi/cnn-kerberossdr/testing\_data/lora:/home/classifier/cnn-kerberossdr/testing\_data/lora

-v /home/pi/cnn-kerberossdr/testing\_data/sigfox:/home/classifier/cnn-kerberossdr/testing\_data/sigfox

-v /home/pi/cnn-kerberossdr/testing\_data/zwave:/home/classifier/cnn-kerberossdr/testing\_data/zwave

-v /home/pi/cnn-kerberossdr/testing\_data/other:/home/classifier/cnn-kerberossdr/testing\_data/other

-v /home/pi/cnn-kerberossdr/model:/home/classifier/cnn-kerberossdr/model [ImageID]

1. Run a prediction scan
   1. run the following by inserting the proper image ID for **predict**

sudo docker run -it --privileged -v /dev/bus/usb:/dev/bus/usb

-v /home/pi/cnn-kerberossdr/training\_data/lora:/home/classifier/cnn-kerberossdr/training\_data/lora

-v /home/pi/cnn-kerberossdr/training\_data/sigfox:/home/classifier/cnn-kerberossdr/training\_data/sigfox

-v /home/pi/cnn-kerberossdr/training\_data/zwave:/home/classifier/cnn-kerberossdr/training\_data/zwave

-v /home/pi/cnn-kerberossdr/training\_data/other:/home/classifier/cnn-kerberossdr/training\_data/other

-v /home/pi/cnn-kerberossdr/testing\_data/lora:/home/classifier/cnn-kerberossdr/testing\_data/lora

-v /home/pi/cnn-kerberossdr/testing\_data/sigfox:/home/classifier/cnn-kerberossdr/testing\_data/sigfox

-v /home/pi/cnn-kerberossdr/testing\_data/zwave:/home/classifier/cnn-kerberossdr/testing\_data/zwave

-v /home/pi/cnn-kerberossdr/testing\_data/other:/home/classifier/cnn-kerberossdr/testing\_data/other

-v /home/pi/cnn-kerberossdr/model:/home/classifier/cnn-kerberossdr/model [ImageID]