

Akida Raspberry Pi Evaluation Kit

User Guide



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1 INTRODUCTION

The Akida Evaluation Kit is an all-in-one system for Akida technology assessment. It includes web-based demonstrations for typical ML use cases but also includes a pre-installed python virtual environment for rapid development and testing.

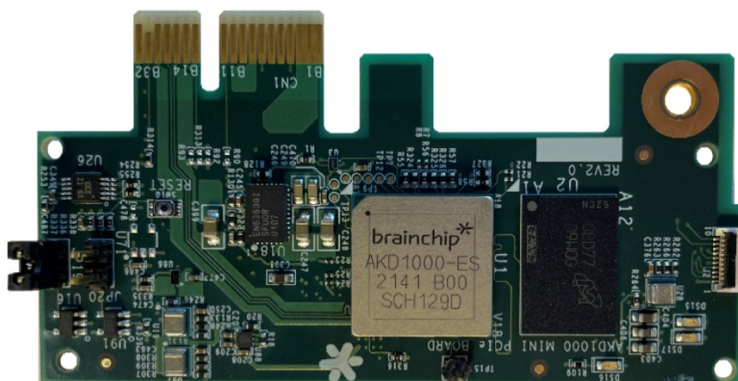


Figure 1: Akida MiniPCIe card

Akida Evaluation Kit content and description:

- RPi Compute Module IO board 4 with WiFi Compute Module 4 (8GB RAM)
- Pre-provisionned SDCard
- Akida Mini PCI Express Reference Board
- Ubuntu server 20.04 / python 3.7
- MetaTF:
 - [akida](#)
 - [akida-models](#)
 - [cnn2snn](#)
 - tensorflow-aarch64

Testing just requires to plug a USB camera and to power up the Akida Evaluation Kit.

2 GETTING STARTED

2.1 RUNNING DEMOS

Once the Akida evaluation kit is started you can run the demos included in your evaluation kit:

- Retrieve the IP address¹ given by your DHCP server to your kit
- Open http://<your_kit_IP> in a web browser to run Akida Demonstrations launcher

If your Pi Compute Module 4 has Wi-Fi capabilities:

- Connect to the *akida-devkit-{xxxx}* WiFi SSID using password *Demo123Demo123*
- Open <http://10.42.0.1> in a web browser to run Akida Demonstrations launcher

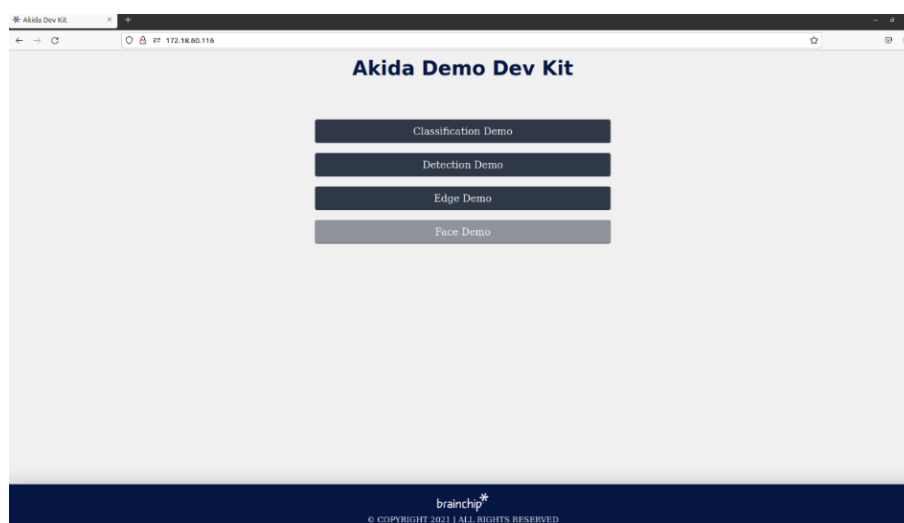


Figure 2: Akida Demonstrations launcher

Please refer to the next section for demonstrations content.

2.2 DEVELOPING

MetaTF development details can be found at <https://doc.brainchipinc.com/index.html>

For development and testing, use the provided python virtual environment. To do so, log into the system using a **ssh** connection with the following developer credentials:

- User: **bcdev**
- Password: **Demo123**

¹ From a Linux system `sudo arp-scan --interface=en01 --localnet` can for example be used to get the “Raspberry Pi Trading Ltd” host IP.

Then, execute `source venv_akida/bin/activate` command from `/home/bcdev` to get MetaTF environment fully set up.

3 AKIDA DEMOS

3.1 RUN THE AKIDA DEMOS

Select the demo you would like to run. It will take a few seconds to come up.



Figure 3: Akida Demonstration selection

3.2 AKIDA CLASSIFICATION DEMO

This application uses the MobileNet/ImageNet model from akida-models to classify Webcam frames.

Place objects in front of the camera for prediction.

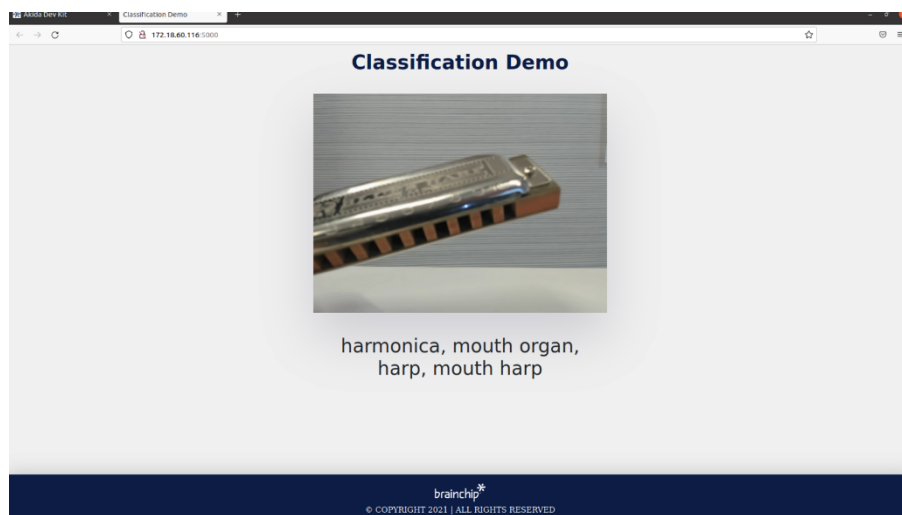


Figure 4: Akida Classification demo

3.3 TO CHANGE DEMOS

Click on the “Akida Dev Kit” tab, click on the green button to stop the running demo and then select another one.

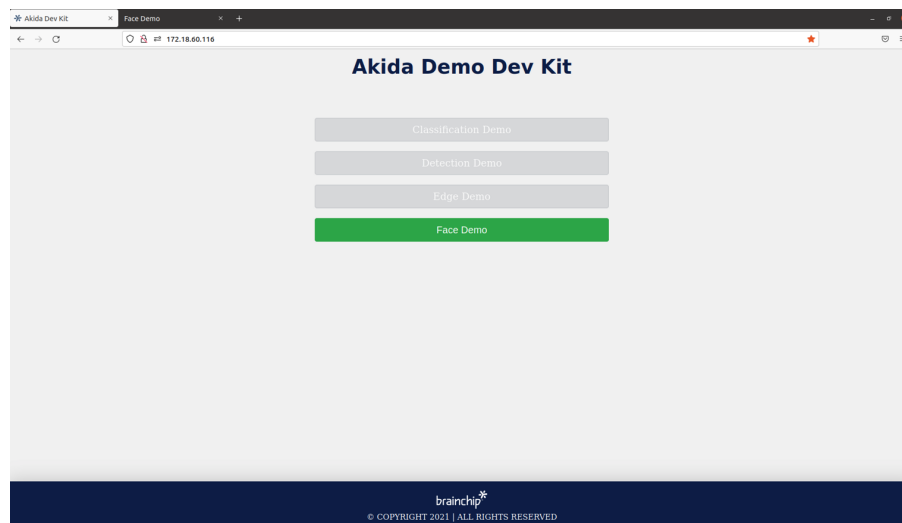


Figure 5: Changing demo

3.4 AKIDA EDGE LEARNING DEMO

This application uses MobileNet models replacing the top layer to learn new classes from the Webcam frames.

Enter class name in the label field and click **learn** for each new class. Start with background as the first class. Next choose other objects the same or similar to images in the ImageNet dataset for best results. For testing, place learned object in the field of view.

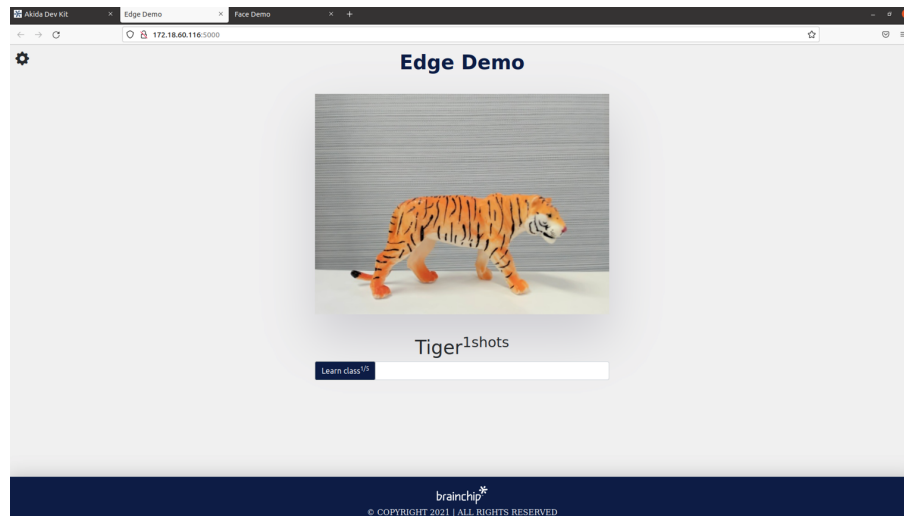


Figure 6: Akida Edge Learning demo

3.5 EDGE FACE RECOGNITION DEMO

This application uses MobileNet models replacing the top layer to learn new classes from the Webcam frames.

Enter person's name in the label field and click **learn** for each new person.

When a person re-enters the field of view, his face is recognized, surrounded by a boundary box and his name is displayed.

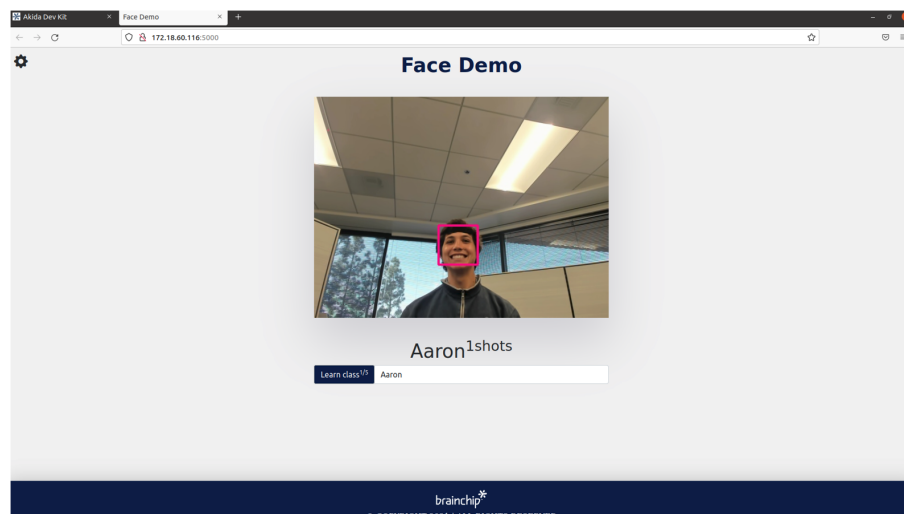


Figure 7: Akida Face Recognition demo

3.6 DETECTION DEMO

This application uses YOLO Akida models to detect objects or faces into webcam frames. Face, person, or object detection should occur with bounding boxes as well as scores. Two modes available: *car/person* and *face*.

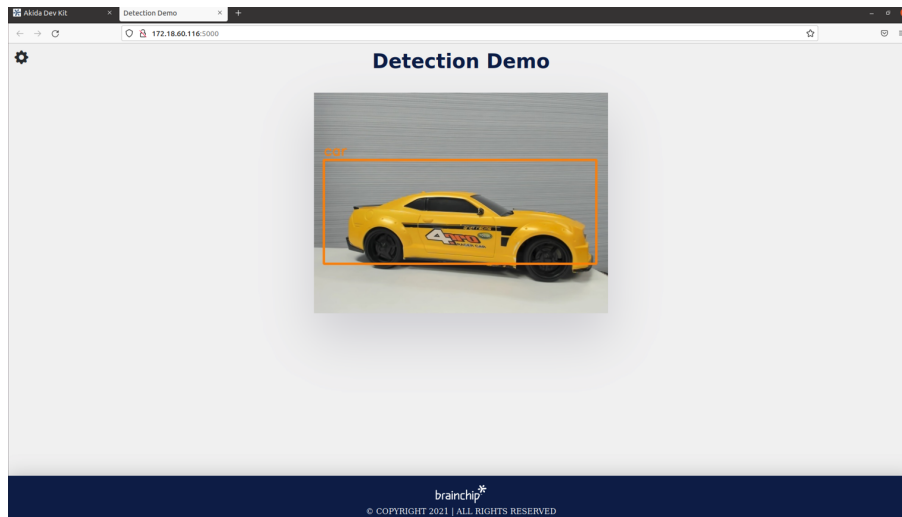


Figure 8: Akida Detection demo

4 TROUBLESHOOT

4.1 RUNNING ISSUE

If the system is stuck or if the demos do not run after performing the required steps in this user guide reboot the system.

4.2 ROOT USER

Is there a root user on my evaluation kit with all root privileges?

Sure there is:

- User: **ubuntu**
- Password: **brainchip**