

IMPLEMENTING AN EFFICIENT AI VISION BY INTERFACING MIPI-CSI2 SENSOR WITH ROCKCHIP NEURAL PROCESSING UNIT IN LINUX KERNEL



JAGANNADHASUTRADHARUDU TEKI

Founder, Upstream Linux Specialist

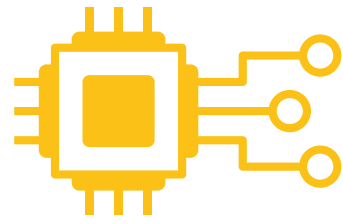


SUNIEL MAHESH

Embedded Linux Engineer

Booth A310 & A312

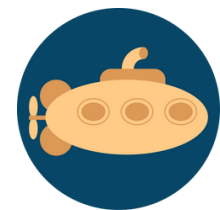
Time: 15 June 2023 14:00 - 14:30 (GMT+8)



Embedded Linux Engineer



Technical Conference Speaker



U-Boot

Contributions (patches)

100+

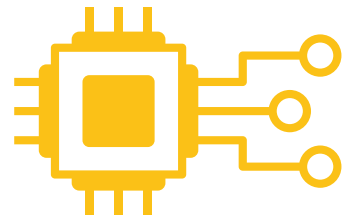


50+



20+

Suniel Mahesh



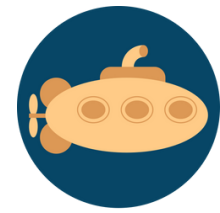
Embedded Linux Engineer



Founder, Upstream Linux Specialist



Technical Conference Speaker



U-Boot



Contributions (patches)

1000+

280+

50+

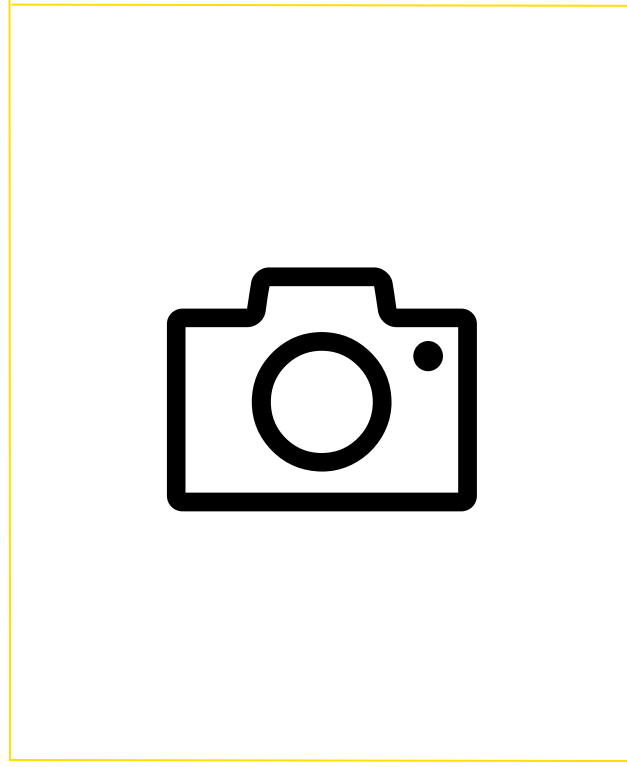
Maintainer (Subsystems)

SPI/SPI Flash
Allwinner sunXi SoC

MIPI DSI Bridge/Panel drivers
NXP PF8X00 PMIC driver

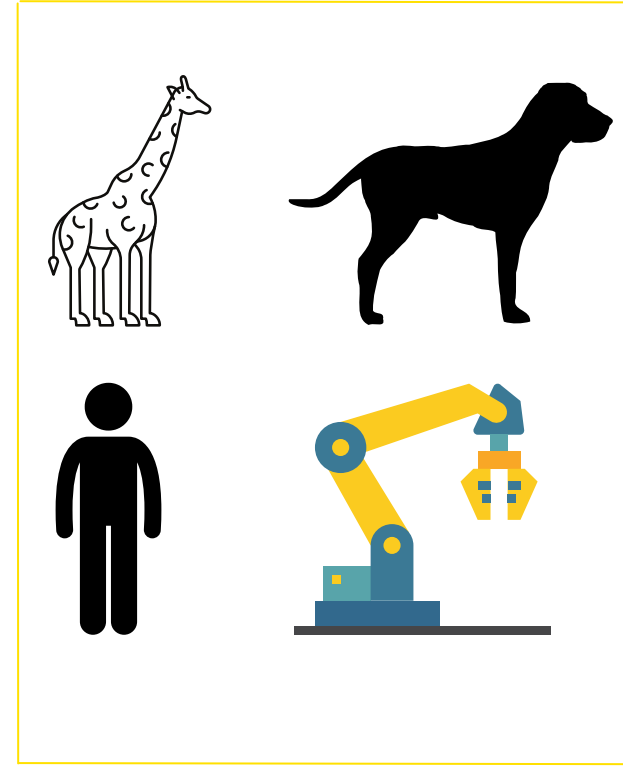
Hardware platforms based
on i.MX6/8, Rockchip, Allwinner

Jagan Teki



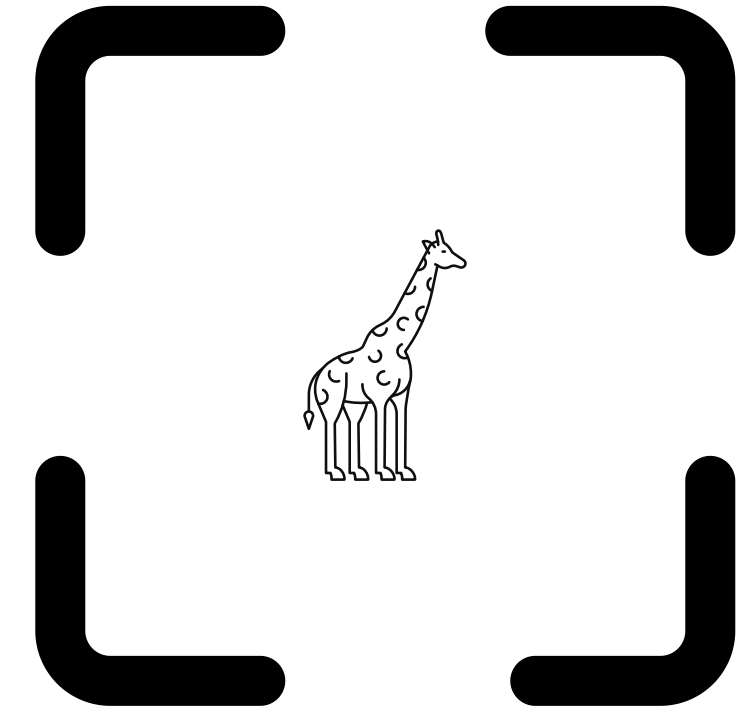
Image

The image capture mechanism with real-time stream or stale



Train

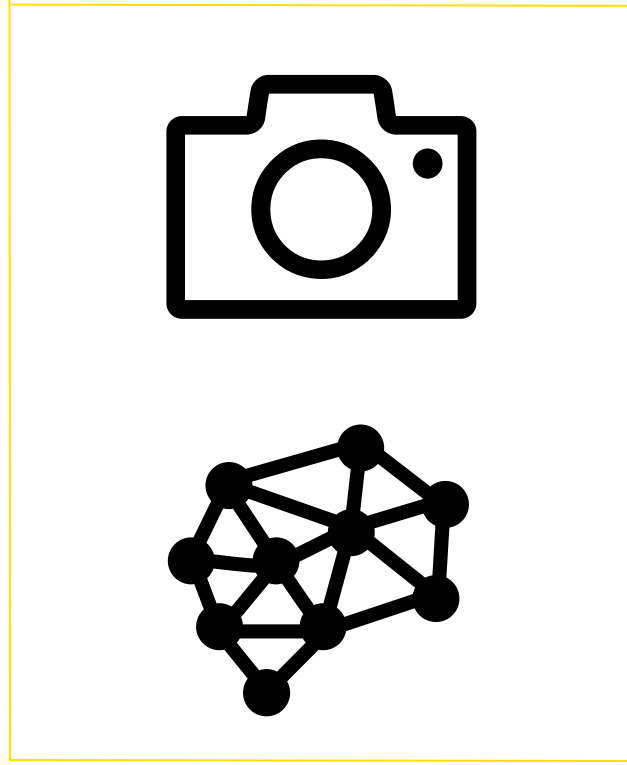
Classify the list of images in a given feed and train them with datasets.



Inference

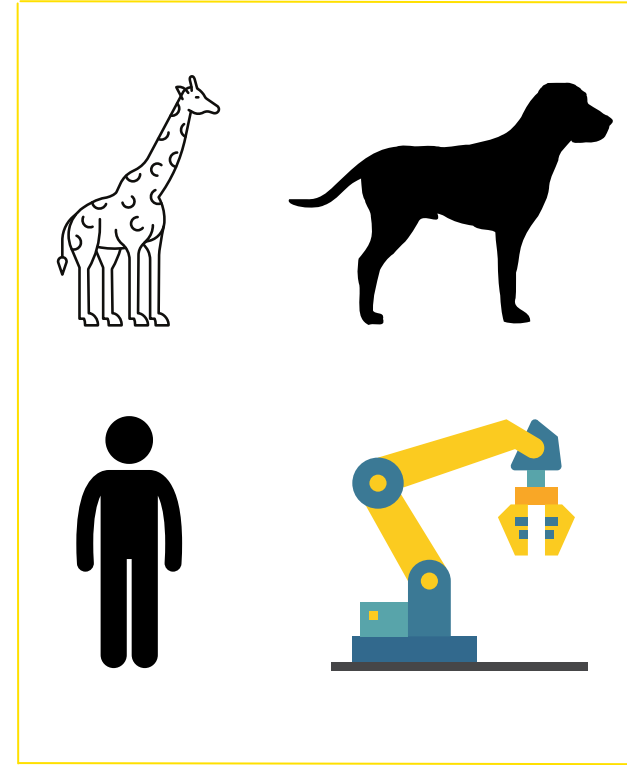
Vision algorithm locating and localizing the multiple images.

Computer Vision, Software-based



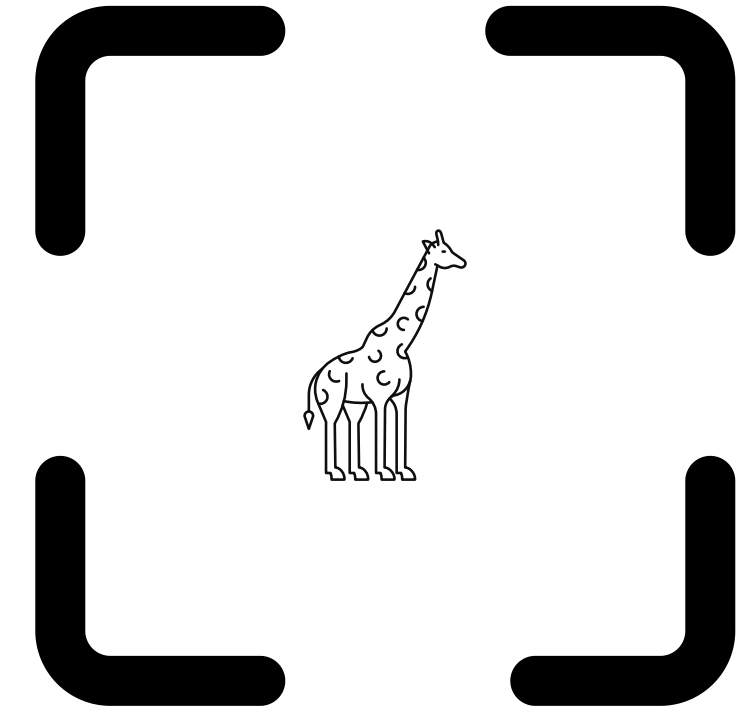
Image, ISP

The image capture mechanism involves capture and ISP



Train

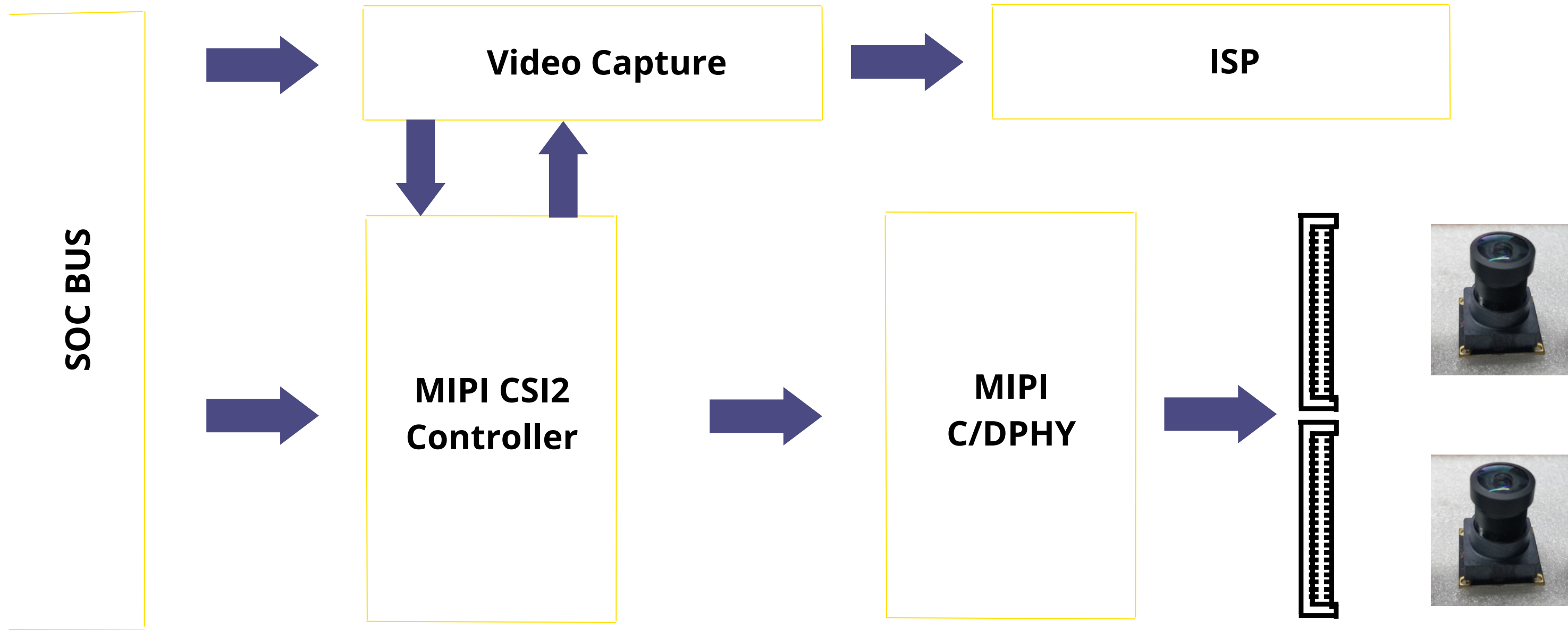
Classify the list of images in a given feed and train them with datasets.



NPU

Vision algorithm locating and localizing the multiple images.

Computer Vision, Hardware-based



MIPI CSI2, ISP

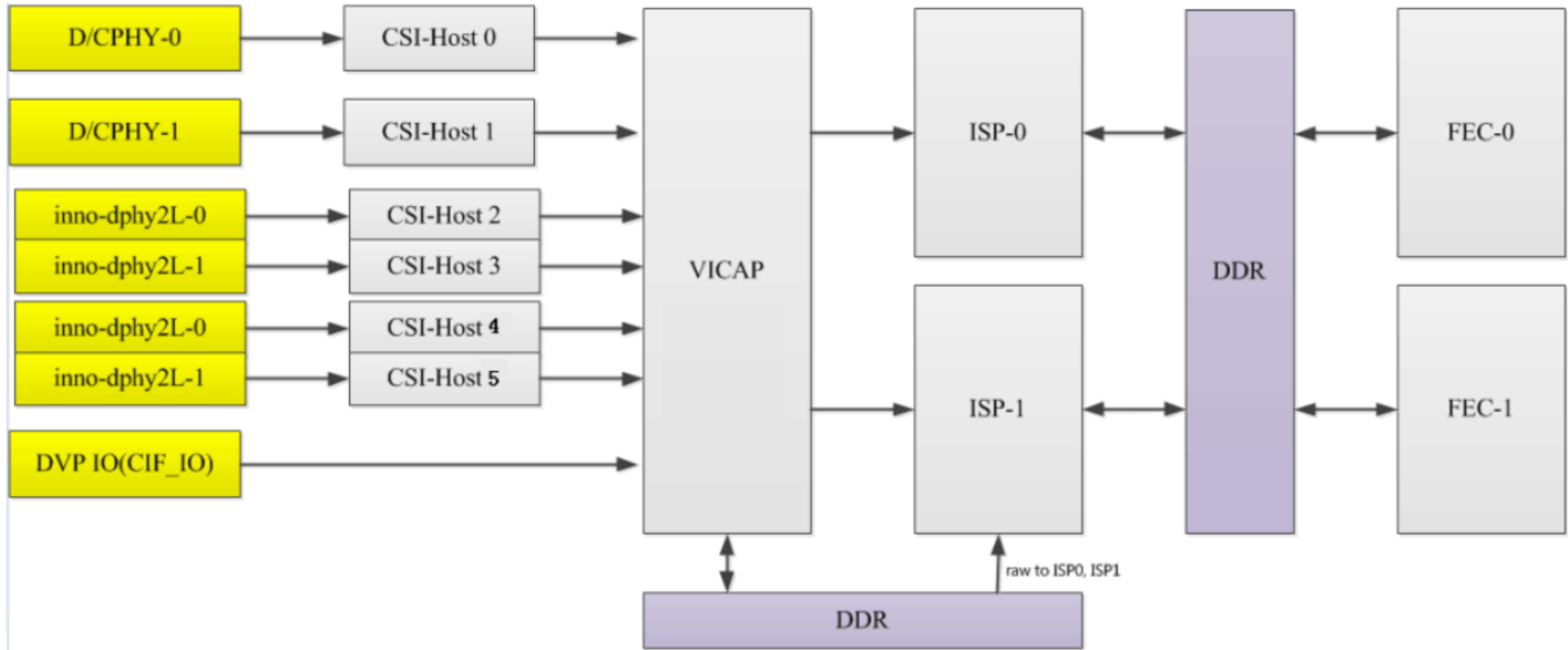


Image Signal Processing, Rockchip

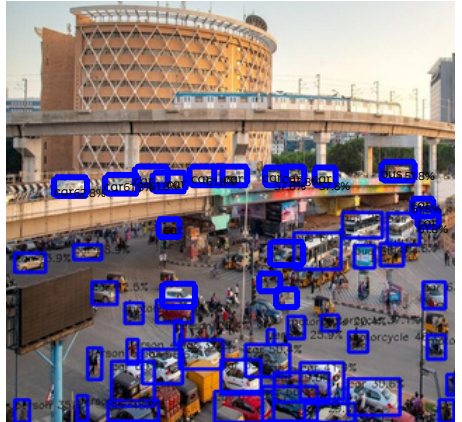
User Model



Neural Model Converter

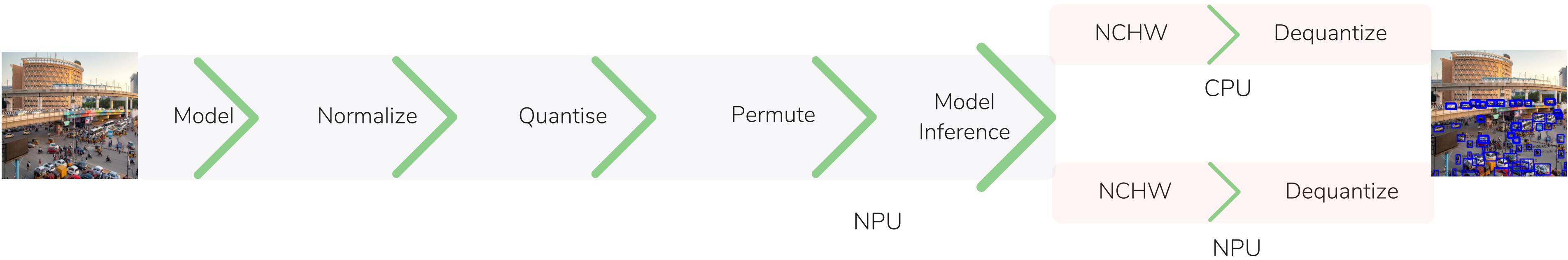


NPU



Training

NPU



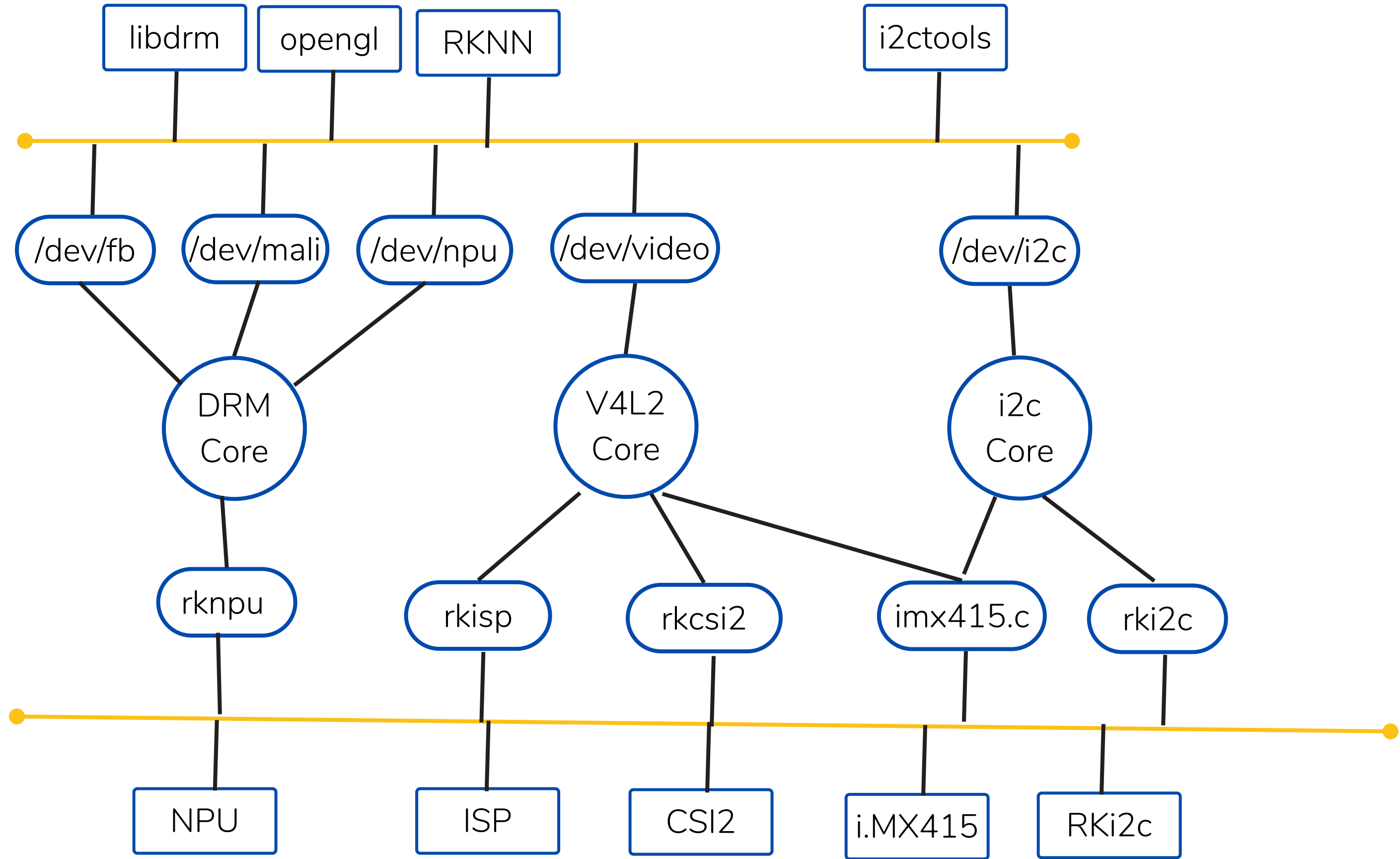
NPU, Rockchip

Linux Video and NPU Subsystem

Userspace

Linux Kernel

Hardware



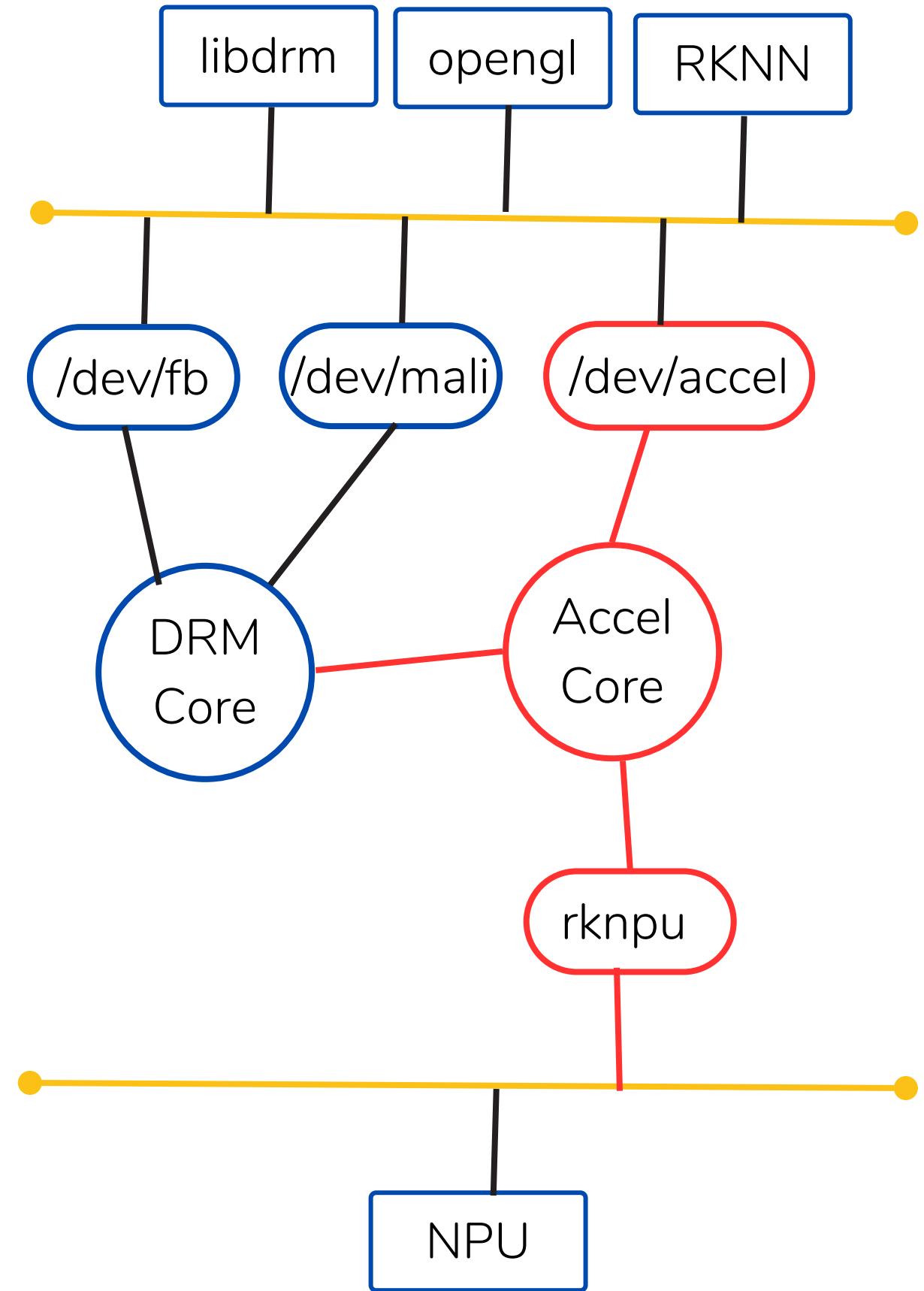
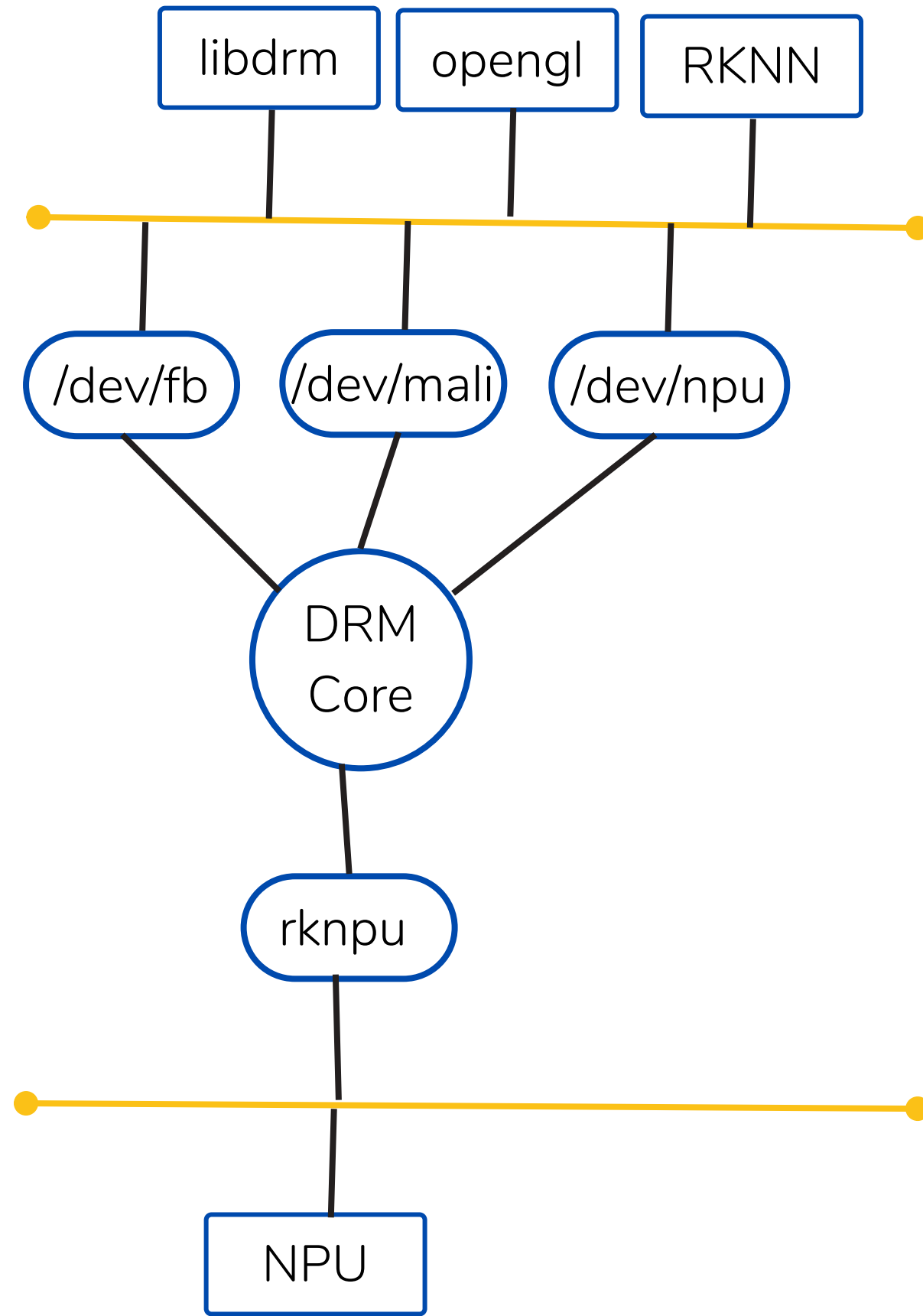
Linux Video and NPU Subsystem

Linux Video and NPU Subsystem, **Upstream**

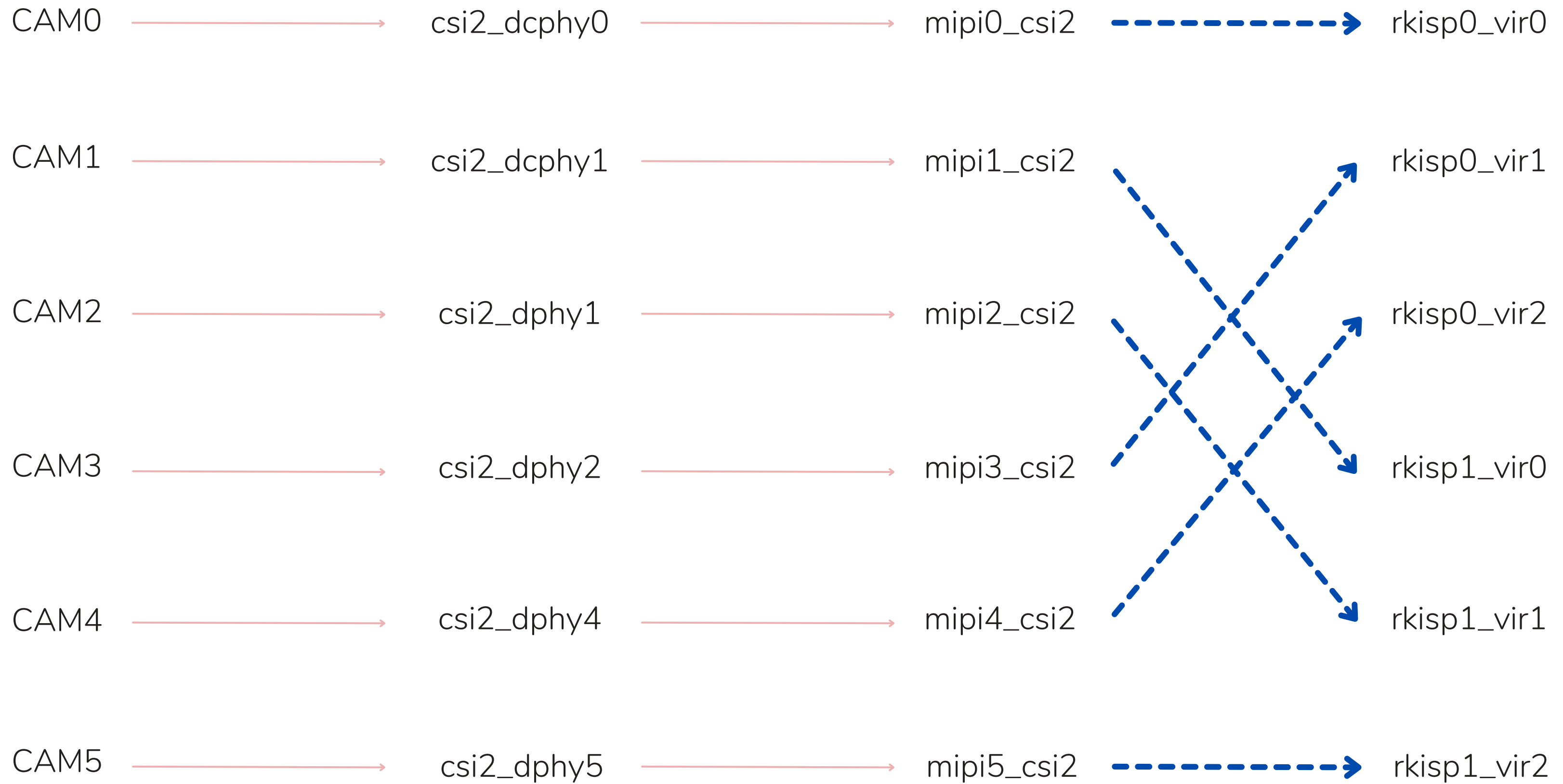
Userspace

Linux Kernel

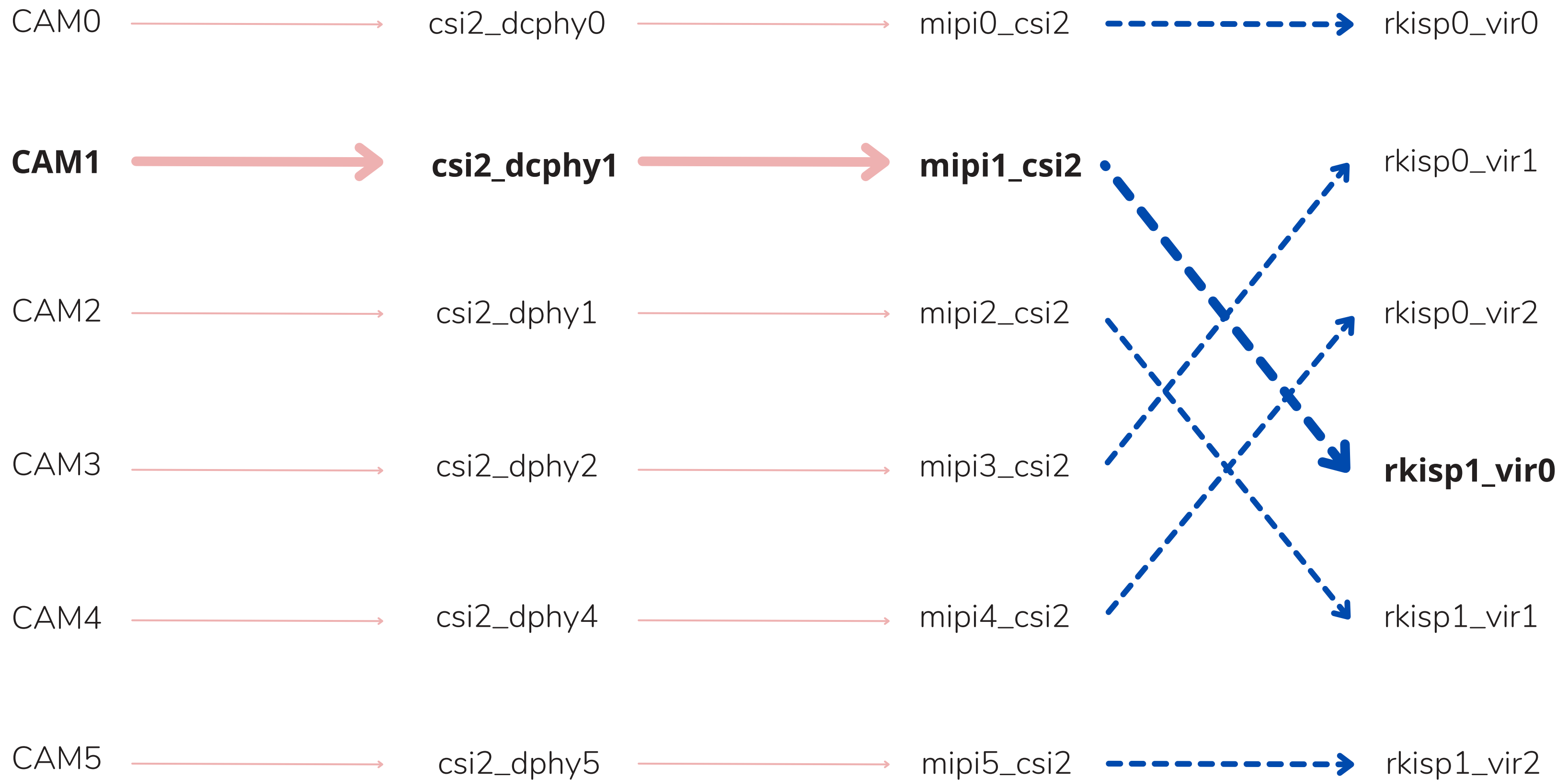
Hardware



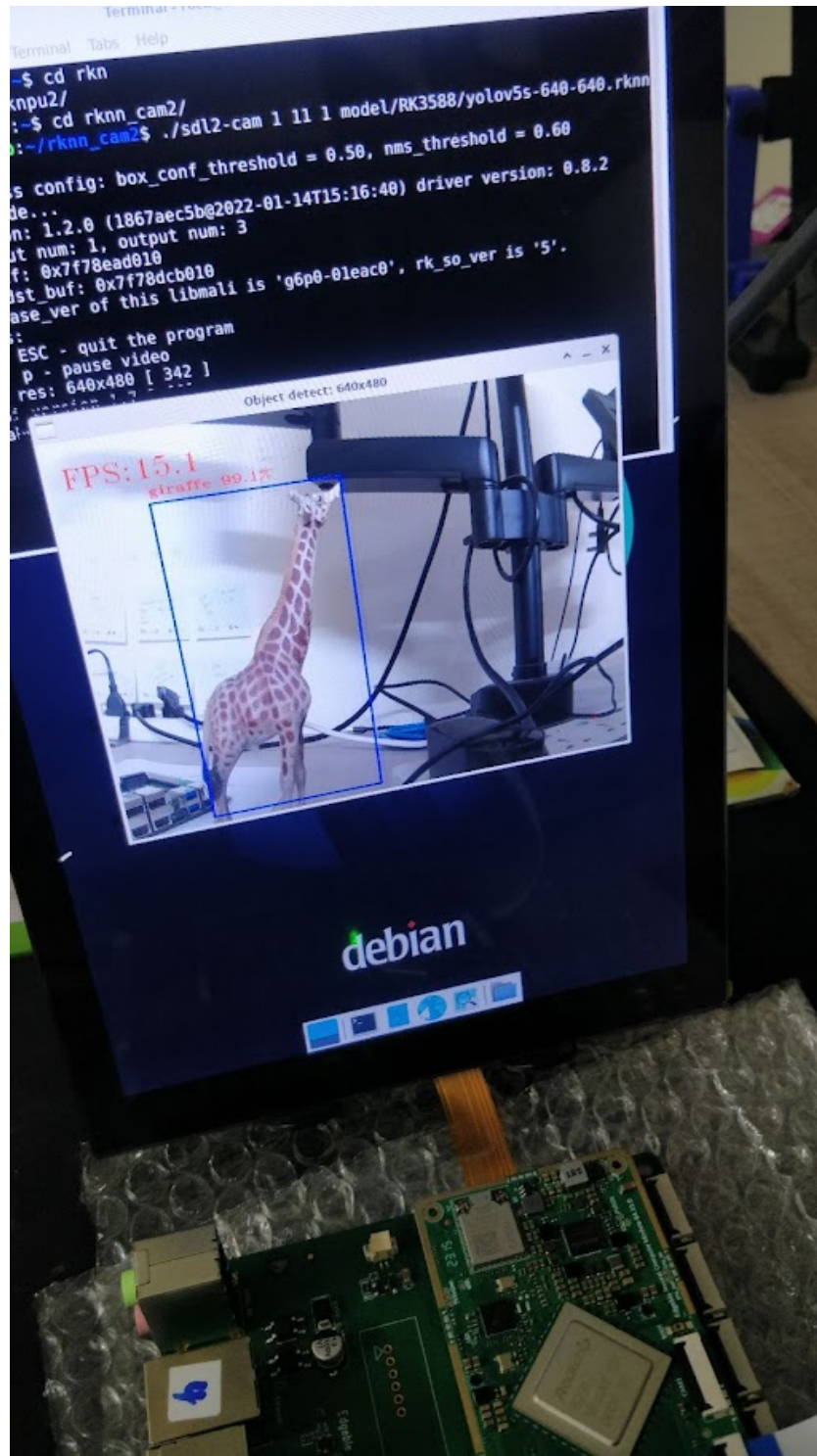
Linux Video and NPU Subsystem, **Upstream**



MIPI CSI2 with ISP Pipeline, RK3588



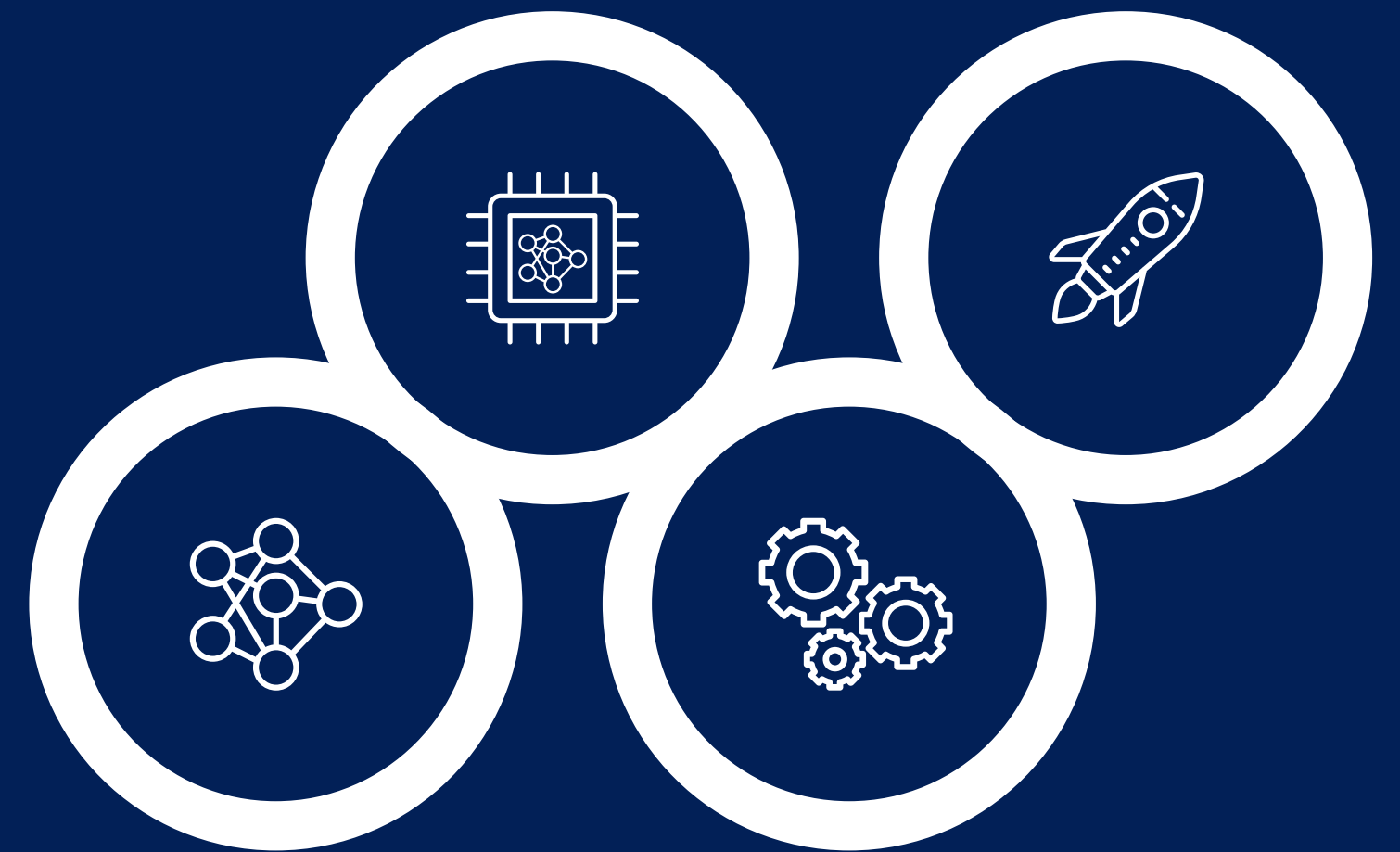
MIPI CSI2 with ISP Pipeline, RK3588 (CAM1)



Booth - A310

A Comprehensive Pre-trained AI Accelerator Platform

Accelerate Your Edge AI deployments with Secure, Scalable, Fast, and Fail-safe Edgeble Pre-trained AI Accelerator Platform.

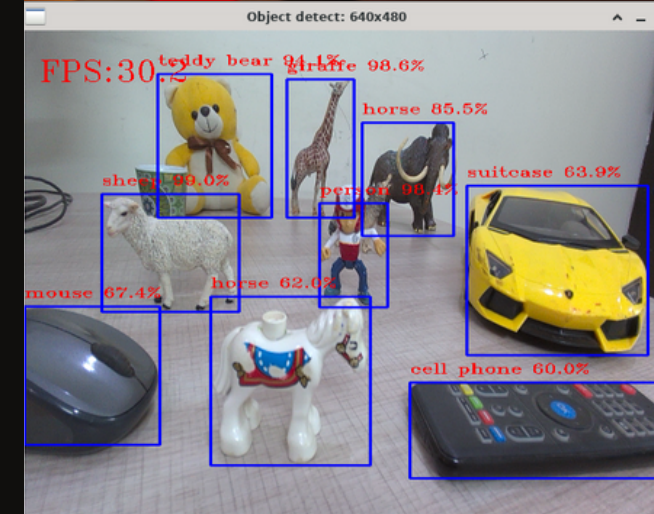


www.edgeble.ai
info@edgeble.ai





Linux Open Source Consultancy for Hardware Enablement Multimedia



Technical Showcase
Open Source Graphics Demo
Shyam Saini and Jagan Teki

What is demonstrated

- Open Source Graphics; Etnaviv, OpenGL runs on i.MX6
 - Run Mainline Linux on Engicam i.CoreM6 with Open Frame LVDS supported board.
 - Run QT5 with OpenGL ES with Etnaviv and MESA 13 open source GPU drivers.
- Open Source Graphics; Mali, OpenGL runs on Allwinner
 - Run Mainline Linux on Allwinner A33, A64 with RGB, MIPI DSI, LVDS supported boards.
 - Run QT5 with OpenGL ES with Mali400 MP2 GPU drivers.
- Open Source Graphics; Mali, OpenGL runs on Rockchip
 - Run Mainline Linux on Rockchip RK3399 with MIPI-DSI, eDP supported boards.
 - Run QT5 with OpenGL ES with Mali-T864 GPU drivers.

Run graphic applications like Qt tests, Kmscube, GImark2 and cinematic experience.

Hardware Information
NXP i.MX6, Allwinner, Rockchip socs boards

What was improved

- Streaming display via gstreamer or any multimedia application
- VPU support with video decoding and encoding
- More graphic validations using camera sensor

Source code or detail technical information availability
<https://github.com/amarula/buildroot-amarula>