

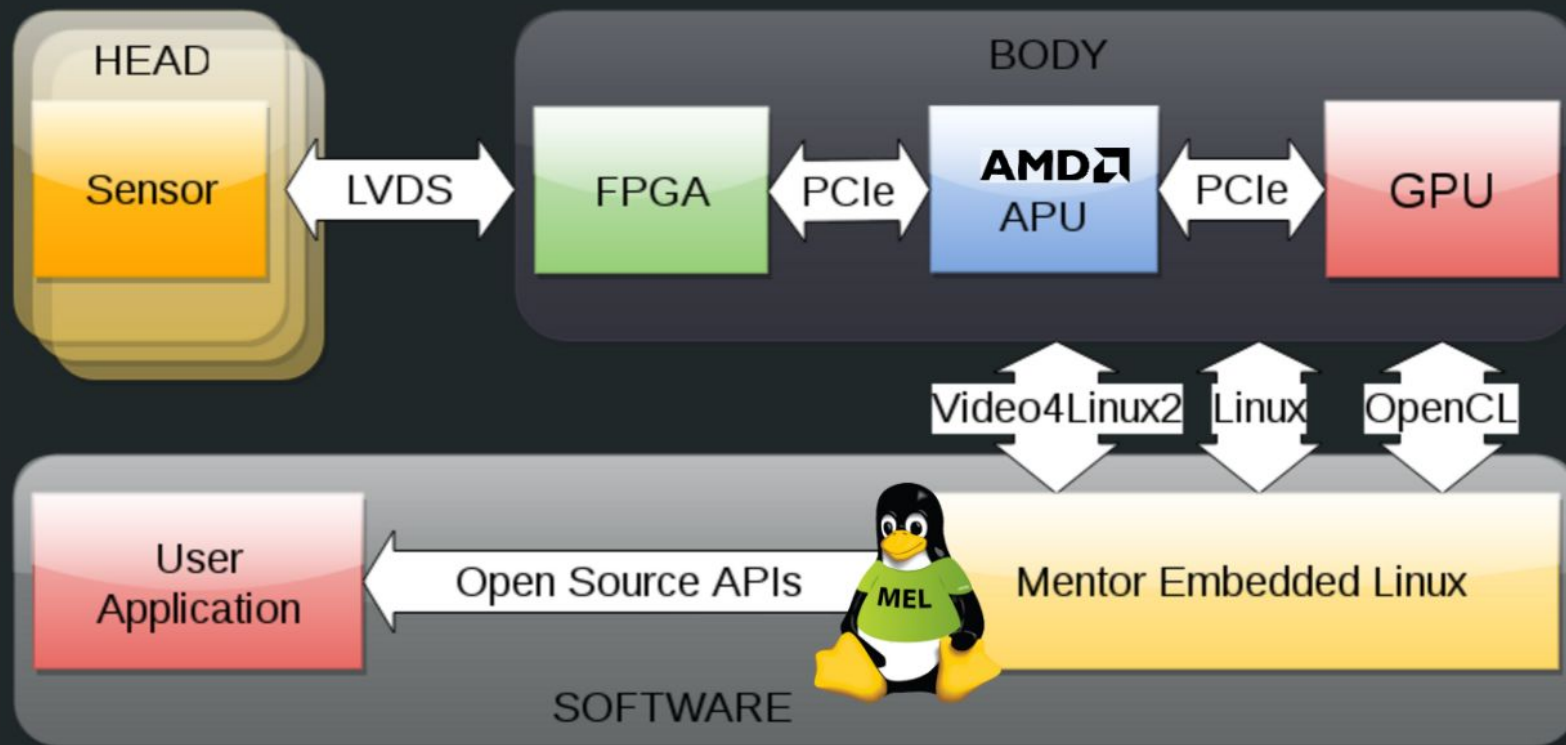
Developing an Industrial Machine Vision Application using Mentor Embedded Linux on AMD R-series SOC with Qtechnology Cameras

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Lead Firmware Engineer
@ribalda

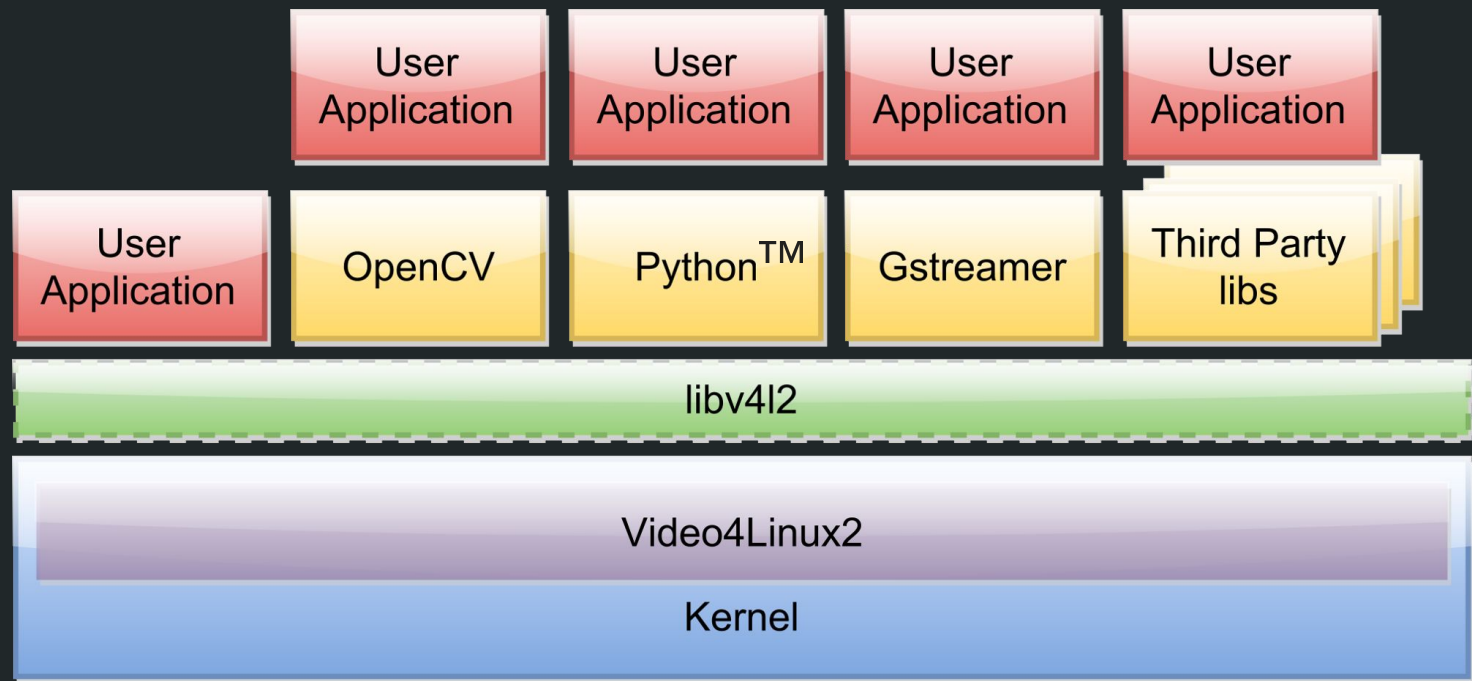
Agenda

- Qtec Camera
- Sensors
- Show me the money!!
- Sourcery Analyzer
- Q & A

Camera Architecture



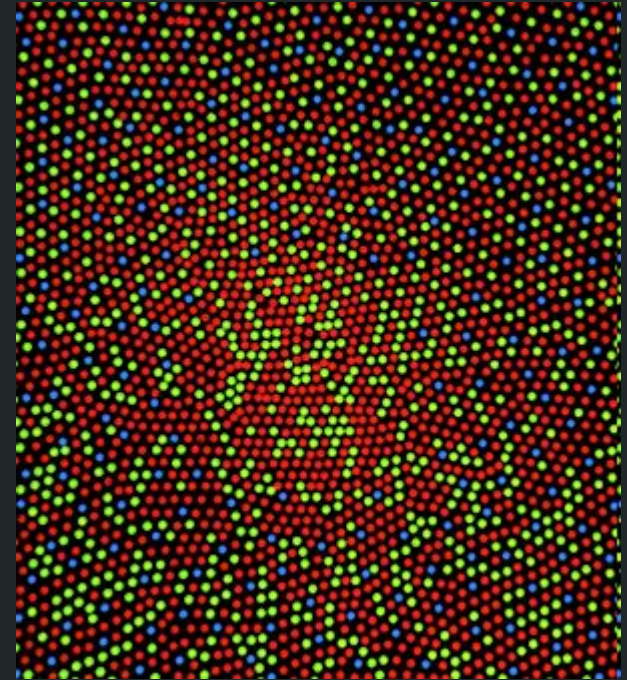
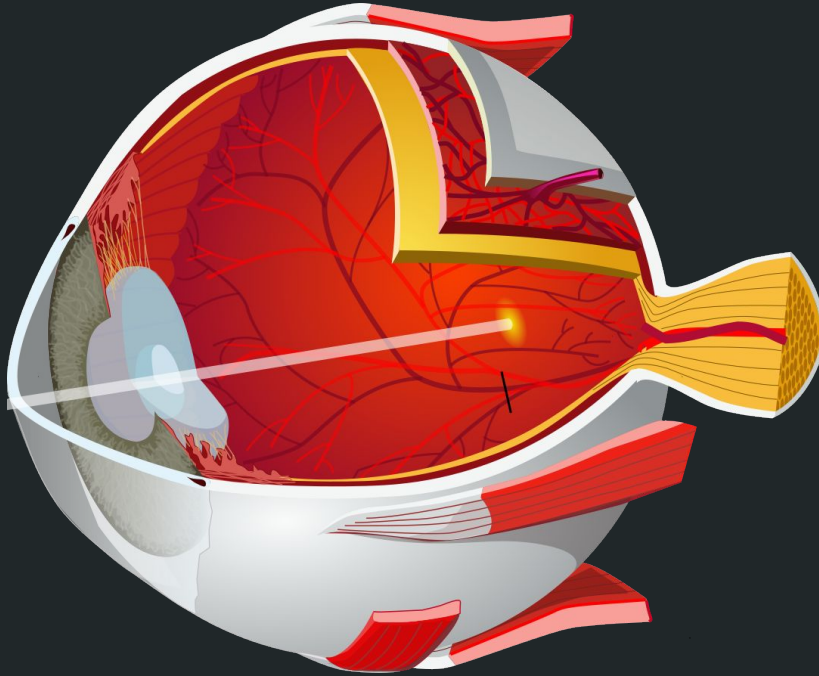
Software





Sensors

Bio-Sensor



Sensor

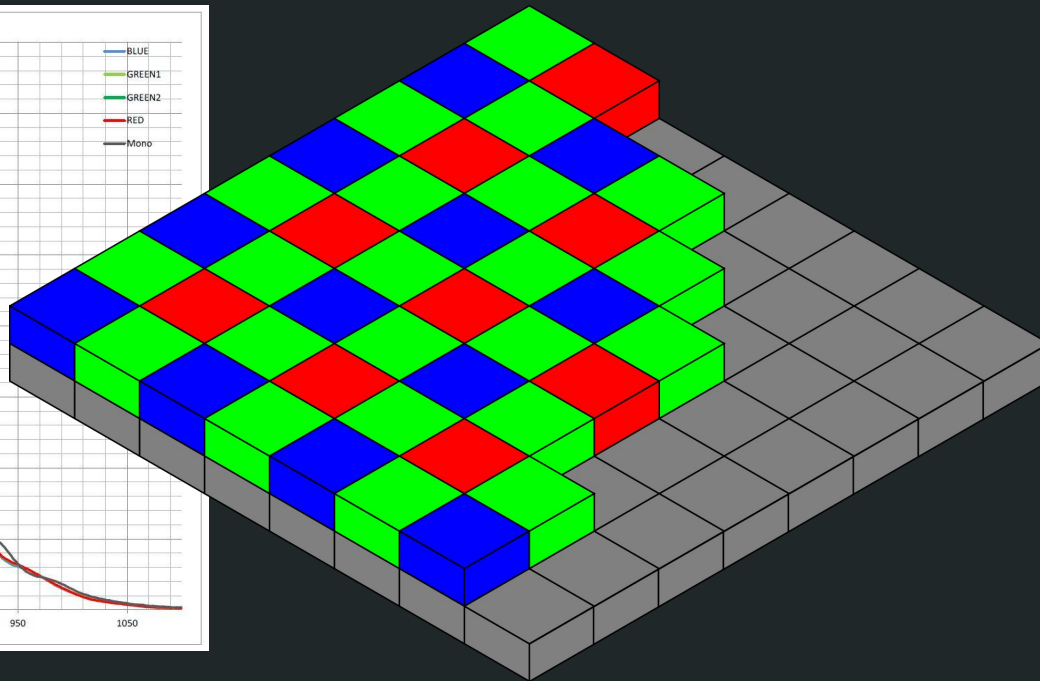
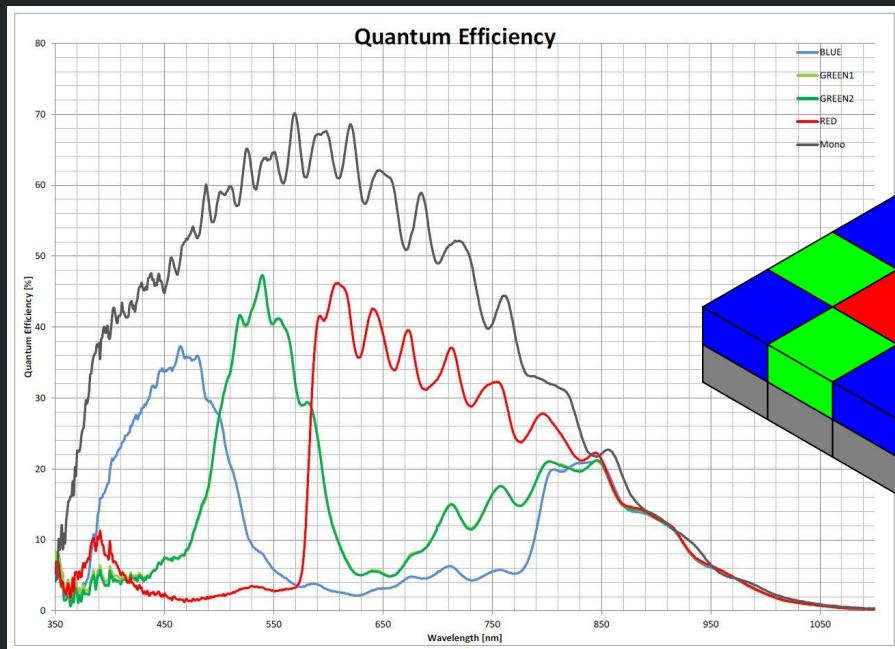
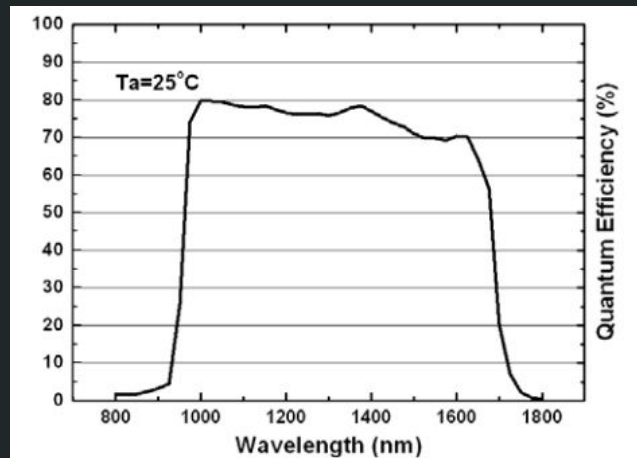
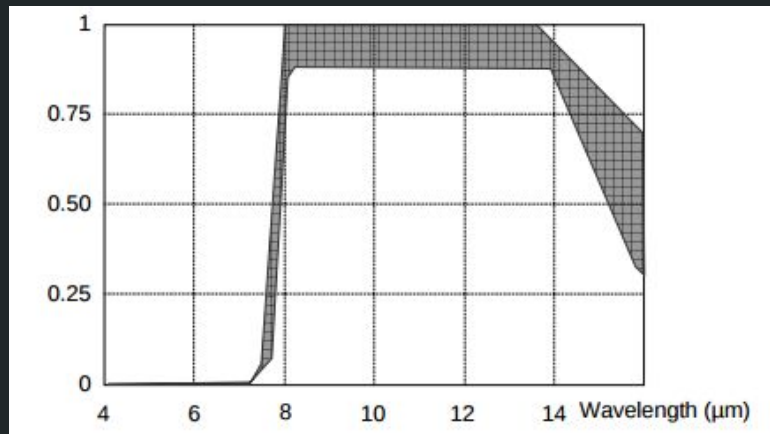


Image Credit: Wikipedia CC BY-SA 3.0

Other sensors



Image Credit: Wikipedia CC BY-SA 3.0

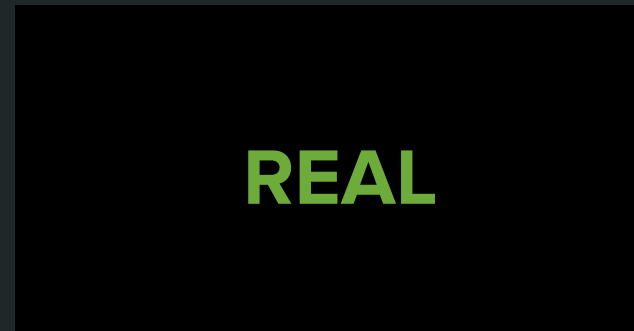




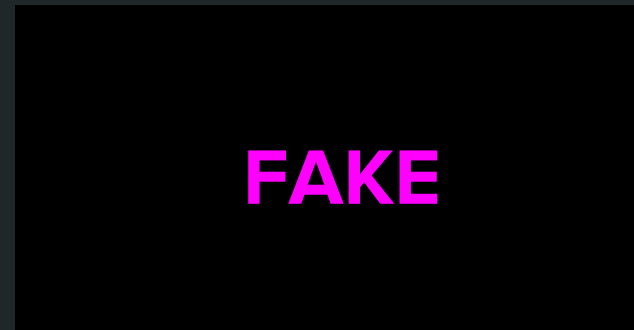
Show me the
money!



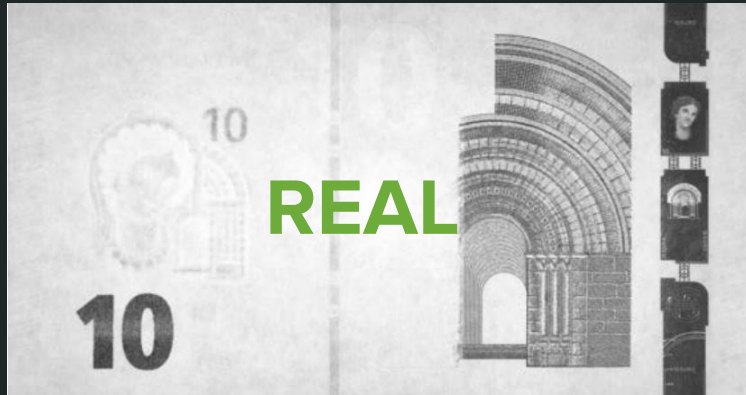
Sensor Selection:



Sensor Selection:



Sensor Selection:



EURO BANKNOTES

SECURITY FEATURES

Various security features have been incorporated into all euro banknotes to protect them against counterfeiting. It is very easy to check a euro banknote of either series by using the simple FEEL, LOOK and TILT method.

FEEL 

LOOK 

TILT 

ADDITIONAL FEATURES

1

2

3

4



4

Infrared properties

Under infrared light, on the front of the banknote, only the emerald number, the right side of the main image and the silvery stripe are visible. On the back, only the value numeral and the horizontal serial number are visible.



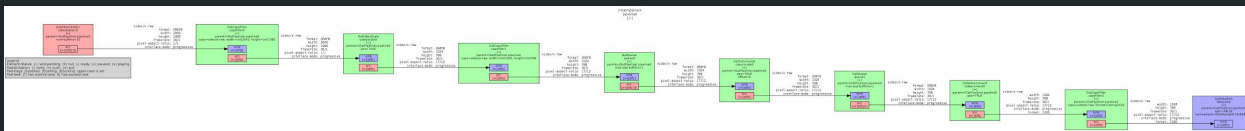
← BACK



Live demo!

Gstreamer

- Pipeline Based
- Hundreds of plugins
- Multithreaded pipelines
- Low overhead
- Good debugging system



```

int main (int argc, char *argv[])
{
    GError *error = NULL;
    GstBus *bus;
    GMainLoop *loop;
    GstElement *pipeline;
    guint bus_watch_id;

    gst_init (&argc, &argv);
    loop = g_main_loop_new (NULL, FALSE);
    pipeline = gst_parse_launch (
        "v4l2src num-buffers=600 ! video/x-raw,width=2040,height=1080,framerate=100/1 ! "
        "euronote !"
        "videoscale ! video/x-raw,width=1024,height=768 !"
        "videoconvert ! video/x-raw,format=I420 ! fakesink", &error);
    bus = gst_pipeline_get_bus (GST_PIPELINE (pipeline));
    bus_watch_id = gst_bus_add_watch (bus, bus_call, loop);
    gst_object_unref (bus);
    gst_element_set_state (pipeline, GST_STATE_PLAYING);
    g_main_loop_run (loop);
    gst_element_set_state (pipeline, GST_STATE_NULL);
    gst_object_unref (GST_OBJECT (pipeline));
    g_source_remove (bus_watch_id);
    g_main_loop_unref (loop);
    return 0;
}

```

Sourcery Analyzer

Live demo!

Results

	FPS	Latency	Gstreamer change
Base	20 FPS	45 ms	
Resized	50 FPS	20ms	videoscale ! video/x-raw,width=800,height=600
Queue	60 FPS	400ms	queue
Size=1	100 FPS	35 ms	queue max-size-buffers=1



More Information

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