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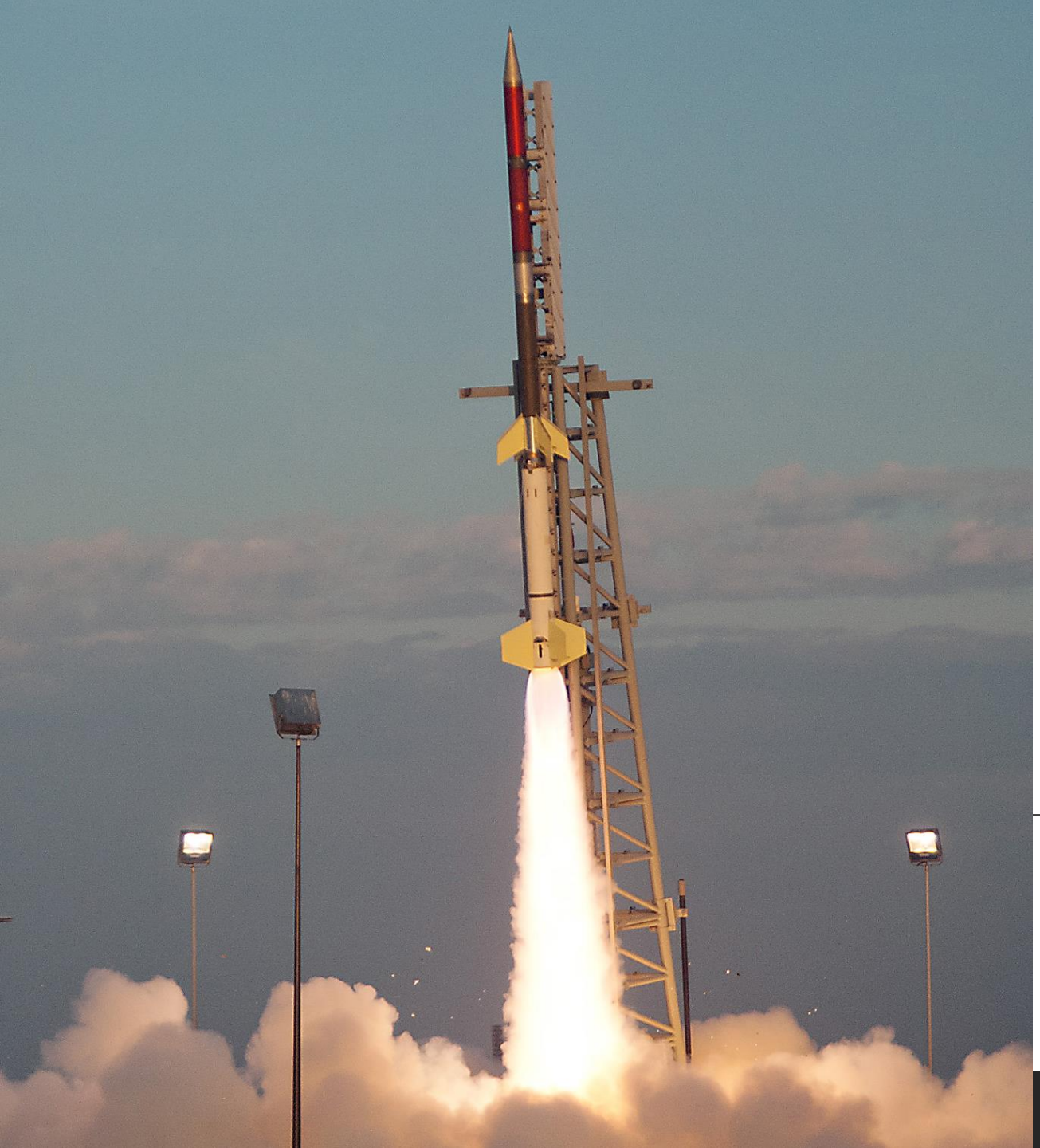

Aplikasi OpenMV pada Roket Sonda pada Saat Uji Terbang

LAPORAN KERJA PRAKTIK

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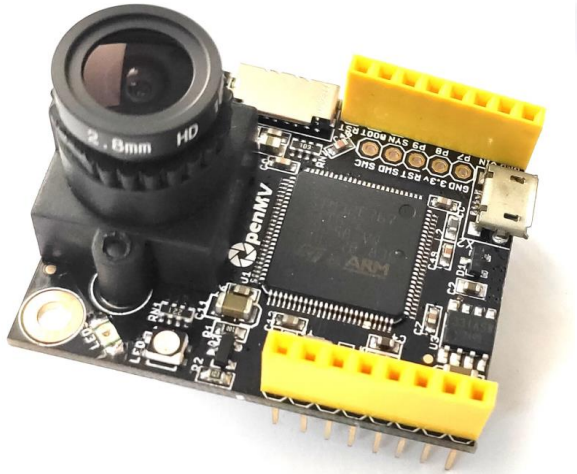
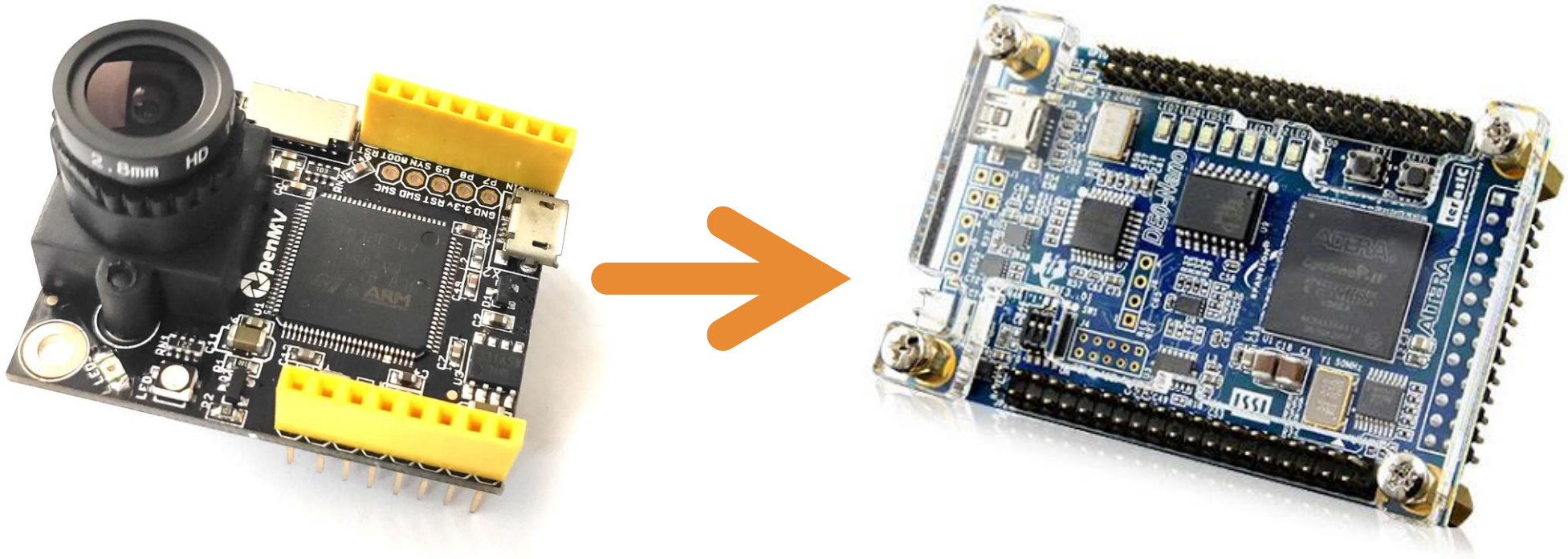
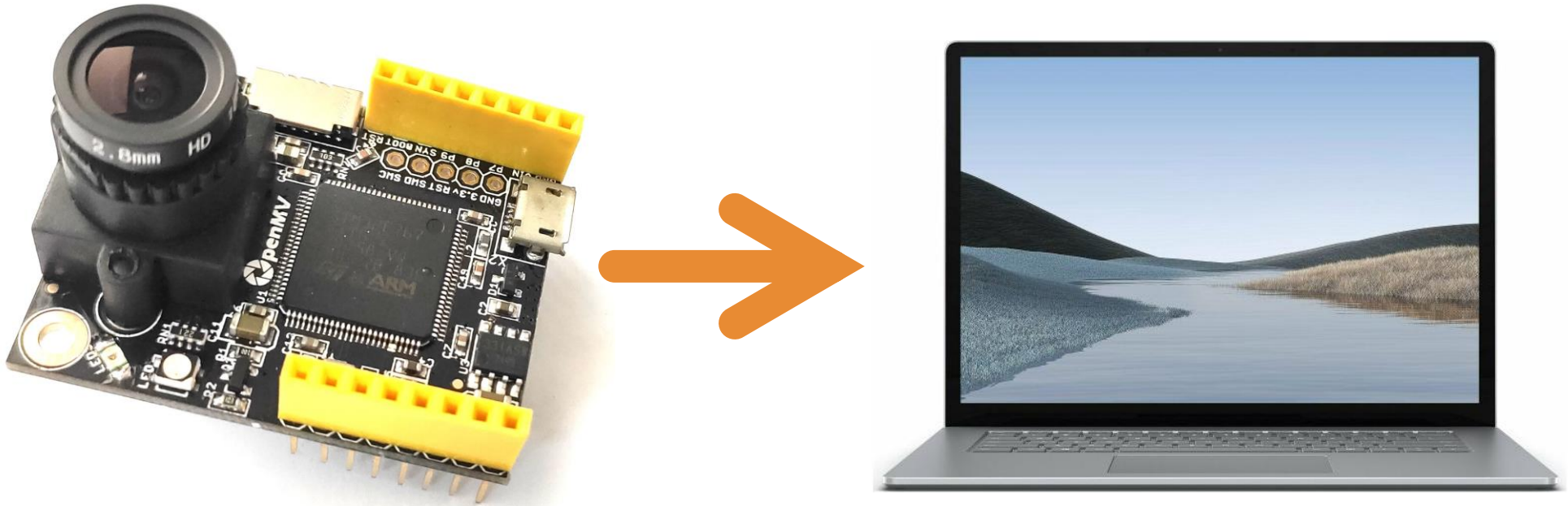
Persiapan



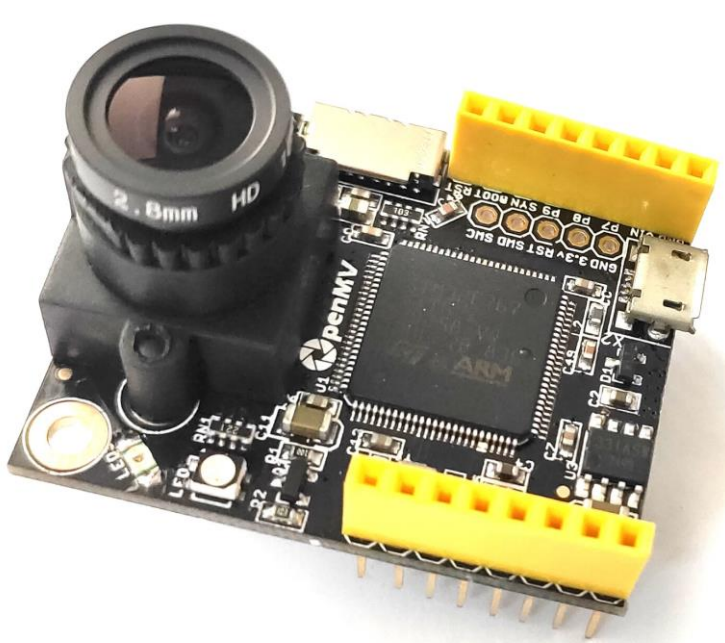
Rumusan Masalah



Rumusan Masalah



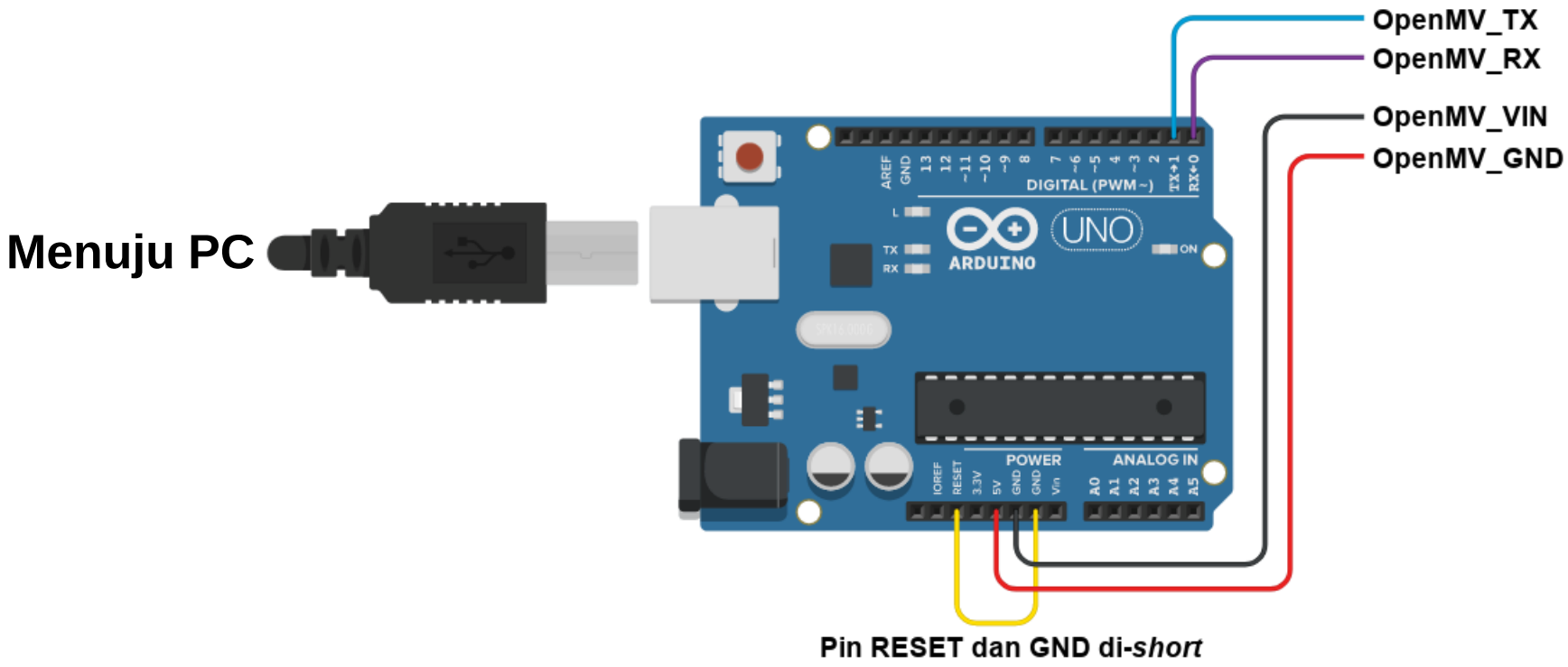
Perancangan *Interface* dari OpenMV Cam M7 ke *Board* FPGA



Serial
UART

Perancangan *Interface* untuk Memverifikasi Data Kamera OpenMV Cam M7 Menggunakan PC

Arduino UNO sebagai USB-to-TTL

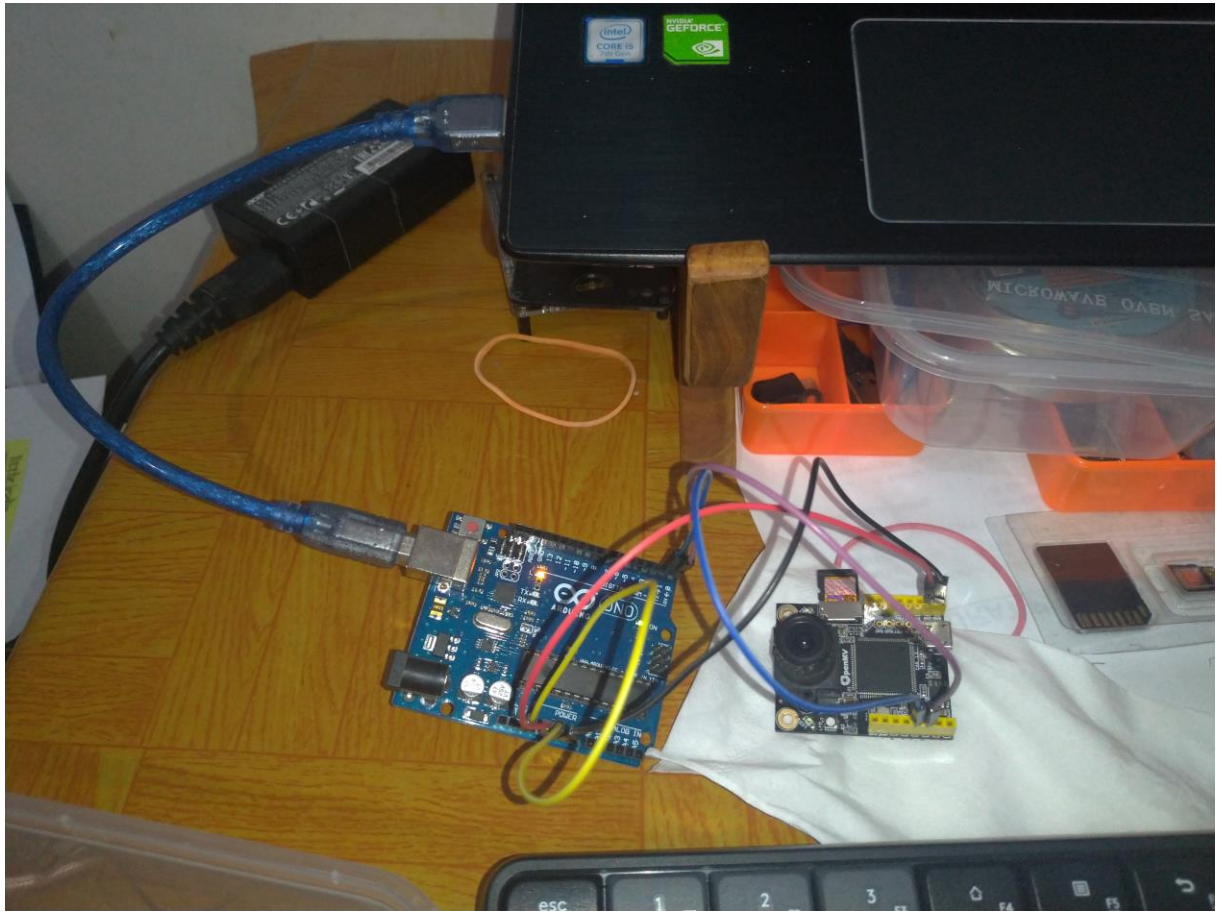


Pin Mapping pada OpenMV Cam M7

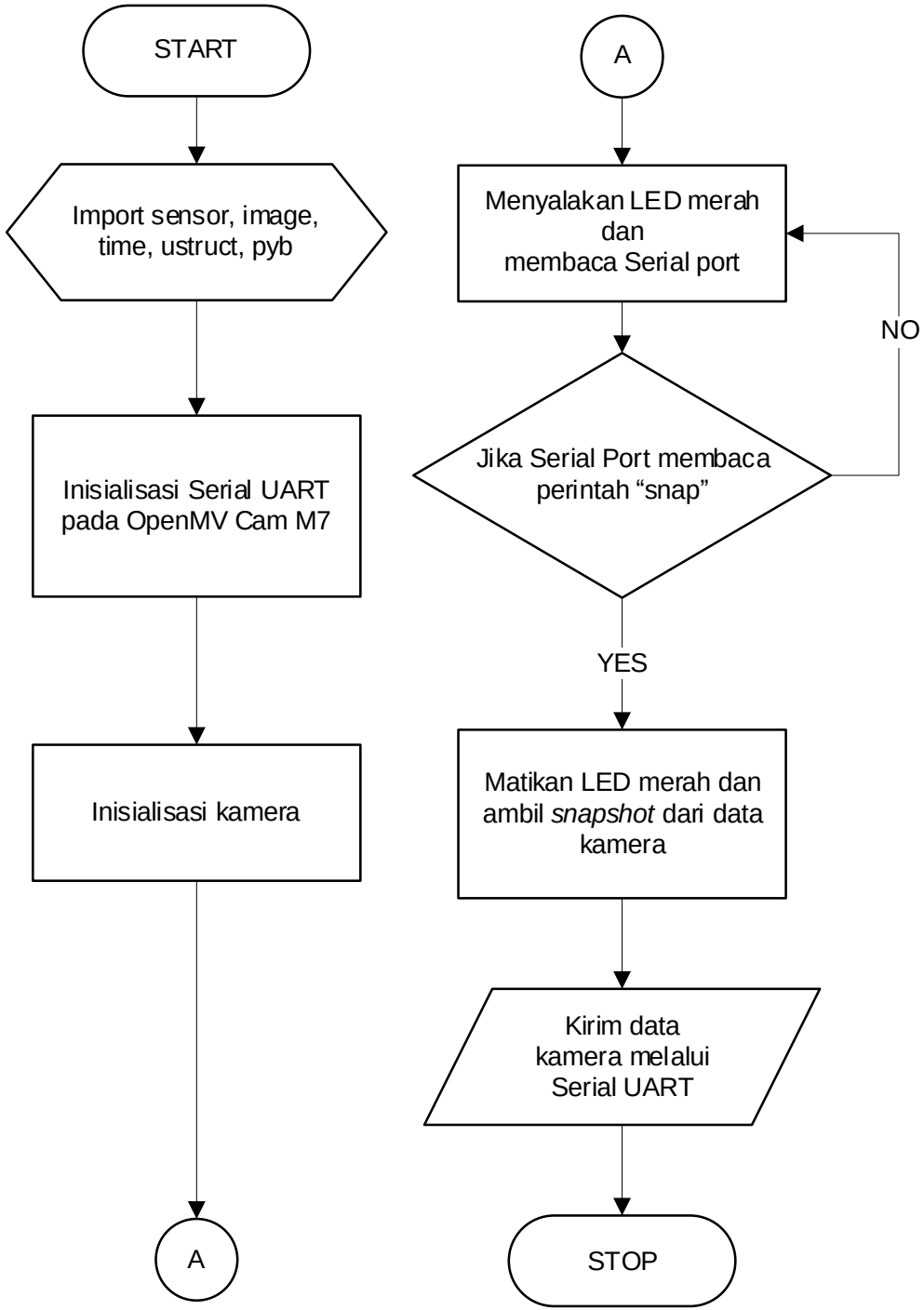
Pin Functions

Pin			Description
Header	No	Name	
J1 Pin Configuration			
J1	1	P0	UART1 RX – TM1 CH3N – SPI 2 MOSI
	2	P1	UART1 TX – TM1 CH2N – SPI 2 MISO
	3	P2	CAN2 TX – TM1 CH1N – SPI 2 SCLK
	5	P4	TIM2 CH3 – I2C 2 SCL – UART 3 TX
	6	P5	TIM2 CH4 – I2C 2 SDA – UART3 RX
	8	3.3	3.3V Rail (250 mA Supply MAX).
J2 Pin Configuration			
J2	1	RST	Reset (Connect to GND to reset).
	2	BOOT	Boot 0 (Connect to 3.3V for DFU mode).
	3	SYN	Frame synchronization pin (Use to frame sync cams).
	4	P9	Servo3 – TIM4 CH3
	5	P8	Servo2 – TIM4 CH2 – I2C4 SDA
	6	P7	Servo1 – TIM4 CH1 – I2C4 SCL
	7	VIN	VIN (3.6V – 5V).
	8	GND	GND Rail
J3 Pin Configuration			
	1	SWC	Serial wire debug clock.

Dokumentasi



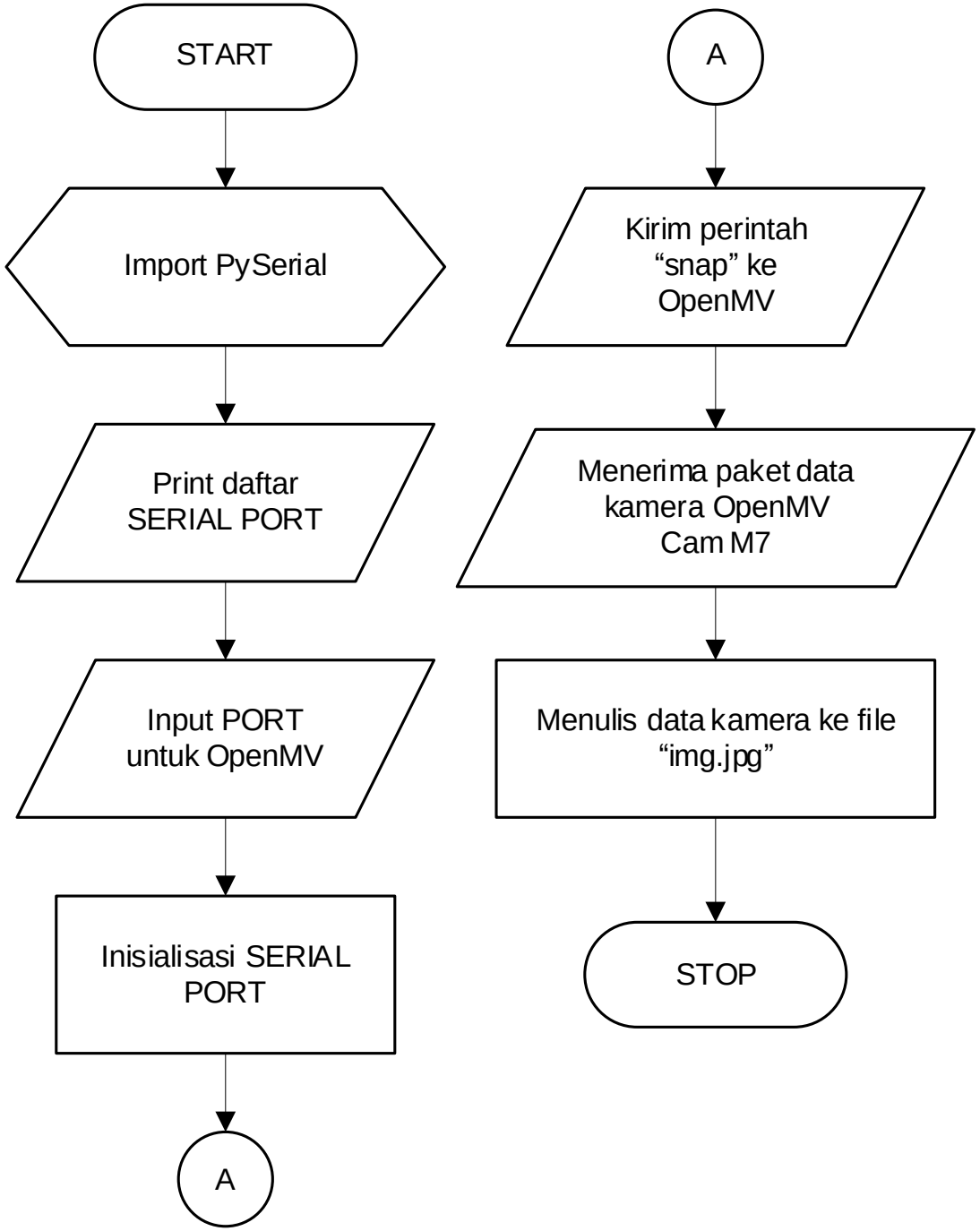
Implementasi Program pada OpenMV Cam M7 untuk Mengirimkan Data Kamera OpenMV



Implementasi Program pada OpenMV Cam M7 untuk Mengirimkan Data Kamera OpenMV

```
import sensor, image, time, ustruct, pyb
uart = pyb.UART(3, 115200, timeout_char=1000)
uart.init(115200, bits=8, parity=0, stop=1, timeout_char=1000)
sensor.reset()
sensor.set_pixformat(sensor.RGB565)
sensor.set_framesize(sensor.VGA)
sensor.skip_frames(time = 2000)
while(True):
        pyb.LED(2).on()
        cmd = uart.read(4)
        if (cmd == b'snap'):
                pyb.LED(2).off()
                img = sensor.snapshot().compressed()
                uart.write(ustruct.pack("<L", img.size()))
                uart.write(img)
```

Implementasi Program pada PC untuk Meng-*capture* Data Kamera OpenMV Cam M7 dan Menyimpannya dalam Format JPEG

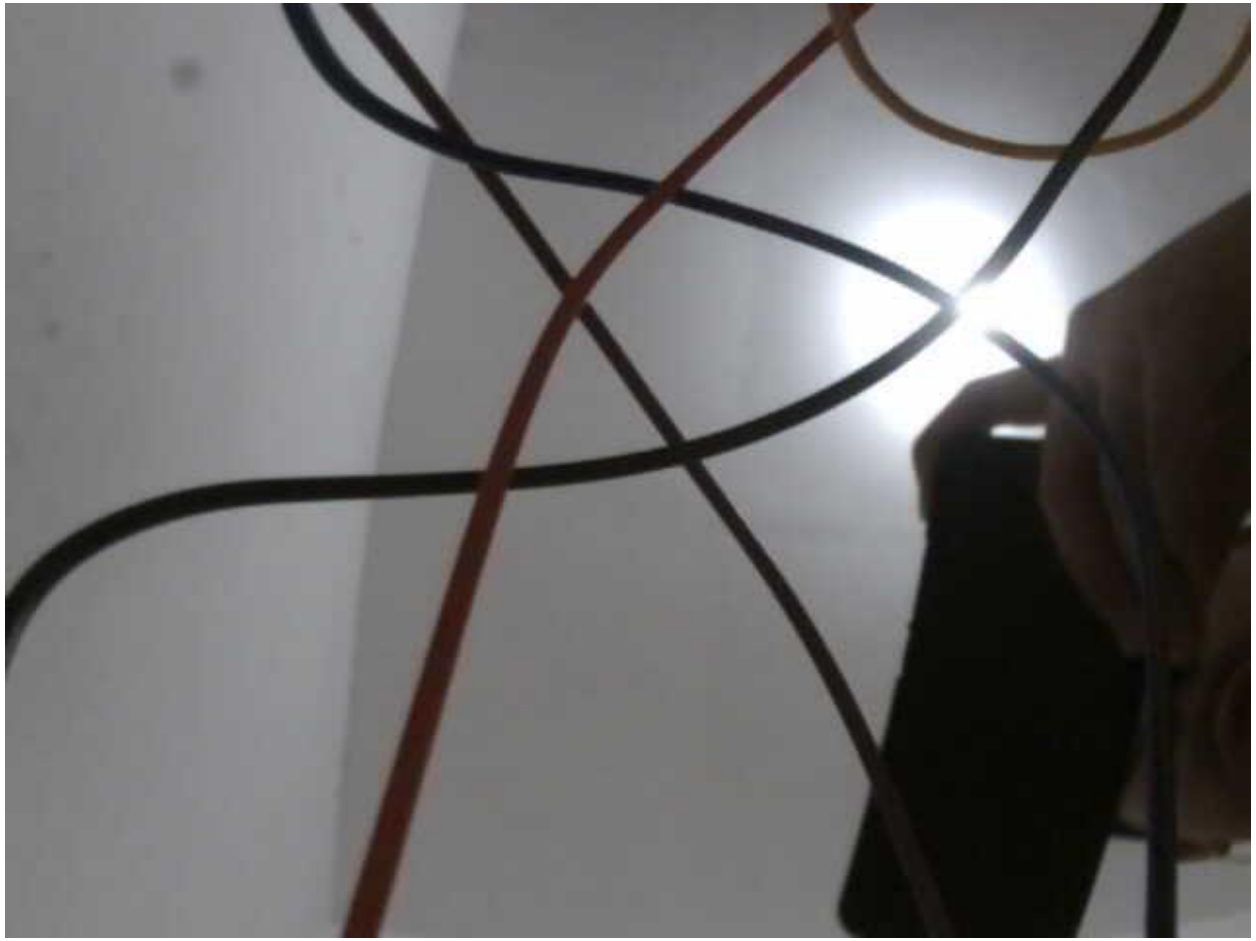


Implementasi Program pada PC untuk Meng-*capture* Data Kamera OpenMV Cam M7 dan Menyimpannya dalam Format JPEG

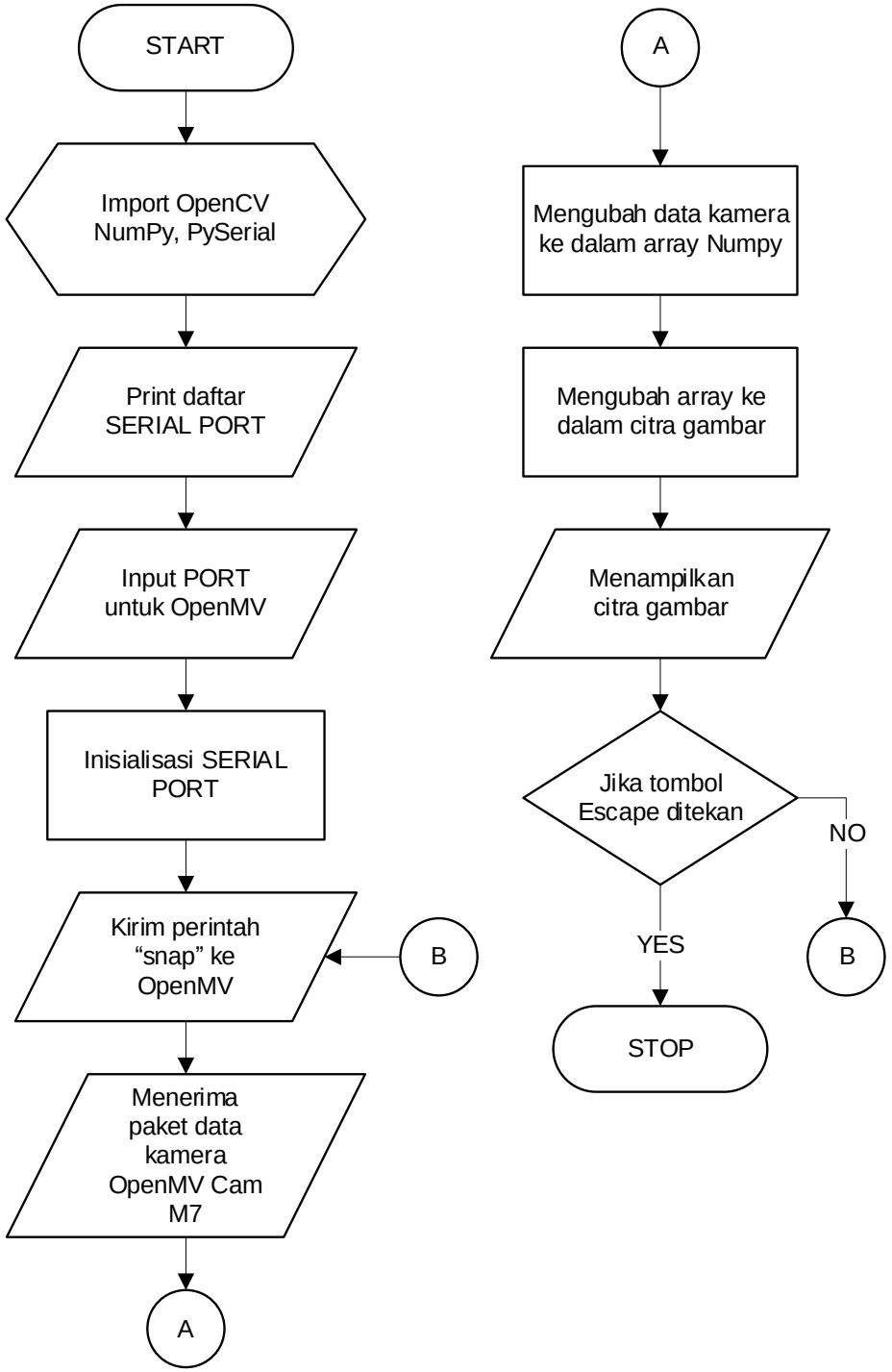
```
"""Python program for host.
Capture JPEG image from OpenCV Cam M7 camera data, one at a time.
Transferred to host using UART.
"""
import sys
import struct
import serial
import serial.tools.list_ports
print("\nAvailable Ports:\n")
for PORT, DESC, HWID in serial.tools.list_ports.comports():
    print("{} : {} [{}]".format(PORT, DESC, HWID))
sys.stdout.write("\nPlease enter a PORT name: ")
sys.stdout.flush()
PORT=input()
print("")
sys.stdout.flush()
sp = serial.Serial(PORT, baudrate=115200, bytesize=serial.EIGHTBITS,
                   parity=serial.PARITY_EVEN, xonxoff=False, rtscts=True,
                   stopbits=serial.STOPBITS_ONE,
                   timeout=None, dsrdtr=True)
sp.write(b'snap')
sp.flush()
size = struct.unpack('<L', sp.read(4))[0]
img = sp.read(size)
sp.close()

with open("img.jpg", "wb") as f:
    f.write(img)
```

Implementasi Program pada PC untuk Meng-*capture* Data Kamera OpenMV Cam M7 dan Menyimpannya dalam Format JPEG



Implementasi Program pada PC untuk Men-*streaming* Data Kamera OpenMV Cam M7 dan Menampilkannya



Implementasi Program pada PC untuk Men-*streaming* Data Kamera OpenMV Cam M7 dan Menampilkannya

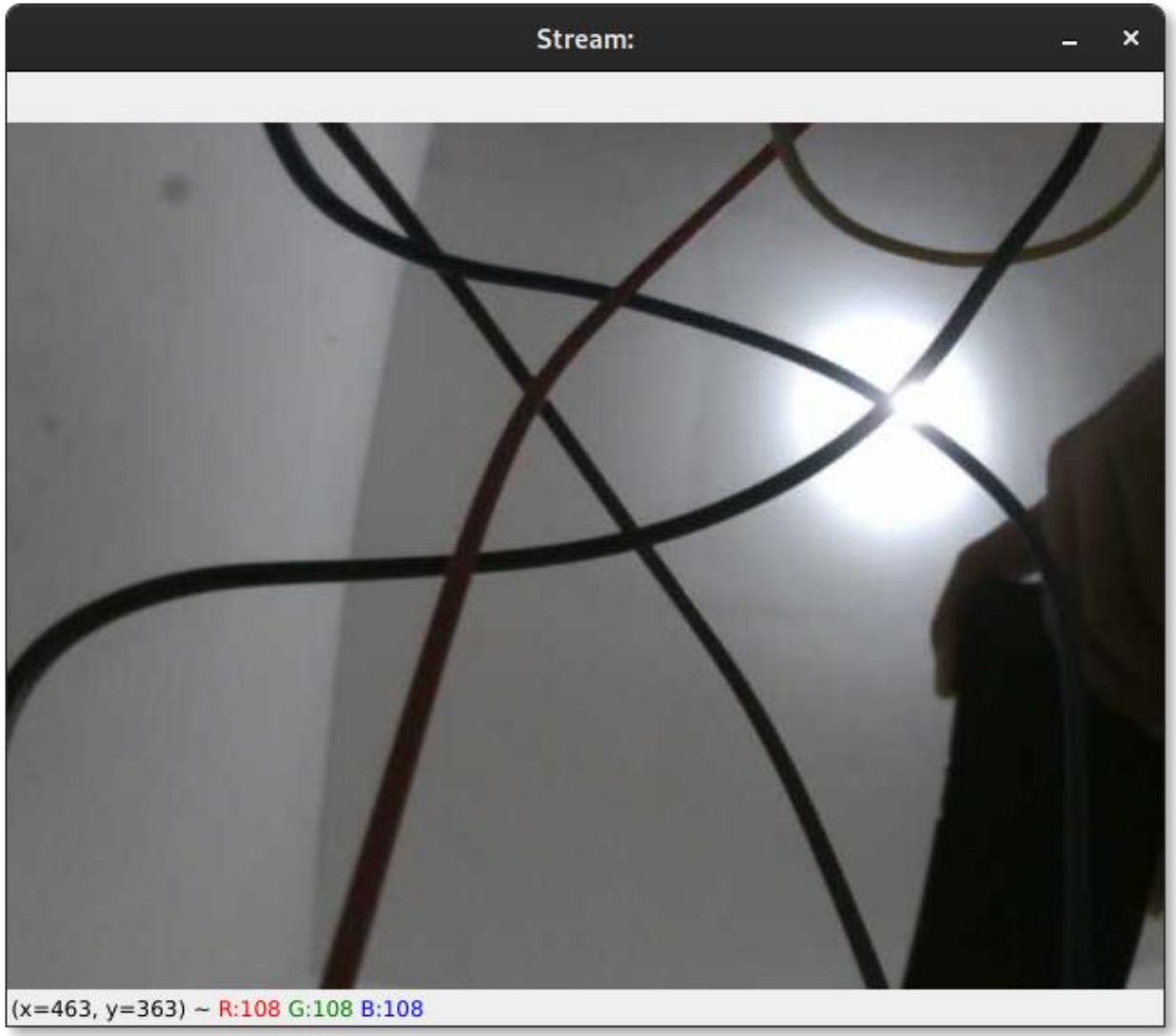
```
"""Python program for host.
Stream JPEG image from OpenCV Cam M7 camera data.
Transferred to host using UART.
"""
# Python libraries
import sys
import struct
import serial
import serial.tools.list_ports
import cv2
import numpy as np
# Print available port
print("\nAvailable Ports:\n")
for port, desc, hwid in serial.tools.list_ports.comports():
    print("{} : {} [{}]".format(port, desc, hwid))
sys.stdout.write("\nPlease enter a port name: ")
sys.stdout.flush()
port = input()
print("")
sys.stdout.flush()
# Serial port initialization
sp = serial.Serial(port, baudrate=115200, bytesize=serial.EIGHTBITS,

parity=serial.PARITY_EVEN, xonxoff=False, rtscts=True,

stopbits=serial.STOPBITS_ONE,
                        timeout=None, dsrdtr=True)
```

```
while True:
    # Read data from the serial buffer
    sp.write(b'snap')
    sp.flush()
    size = struct.unpack('<L', sp.read(4))[0]
    buf = sp.read(size)
    # Use numpy to construct an array from the bytes
    x = np.frombuffer(buf, dtype='uint8')
    # Decode the array into an image
    img = cv2.imdecode(x, cv2.IMREAD_UNCHANGED)
    cv2.imshow("Stream:", img)
    key = cv2.waitKey(20)
    if key == 27:
        #sp.close()
        cv2.destroyWindow("Stream:")
        break
```

Implementasi Program pada PC untuk Men-*streaming* Data Kamera OpenMV Cam M7 dan Menampilkannya



Terima Kasih

APLIKASI OPENMV PADA ROKET SONDA PADA SAAT UJI TERBANG