

ECE 471 Homework 10

Power and Energy

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December 6, 2019

1 Problem 1

This section contains my solution to problem 1 parts a-c.

1.0.1 Part a

The Raspberry Pi 2 has the lowest under-load power draw at 3.4 W.

1.0.2 Part b

The Macbook Air consumes the least amount of energy at 407J.

1.0.3 Part c

The Macbook Air calculates results the fastest at 14s.

2 Problem 2

Not all of the listed boards could meet this deadline. The Raspberry Pi 2, Dragonboard and Raspberry Pi 3 all take longer than 60 seconds to do the matrix-matrix multiply.

3 Problem 3

3.0.1 Part a (Jetson TX-1)

First calculate energy per minute

$$E_{perminute} = 13.4W * 47s + 2.1W * 13s = 657.1J \quad (1)$$

Get energy per hour

$$E_{perhour} = 657.1J * 60 = 39.426KJ \quad (2)$$

3.0.2 Part b (Macbook Air)

First calculate energy per hour

$$E_{perminute} = 29.1W * 14s + 10.0W * 46s = 867.4J \quad (3)$$

Get energy per hour

$$E_{perhour} = 867.4J * 60 = 52.044KJ \quad (4)$$

4 Problem 4

If I were running this project off of a battery I would want to use the Jetson TX-1 because it consumes 75.8% of the power the Macbook Air consumes in the same time.