DRC-Hubo Perception Computer

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This document gives the recommendations for the perception computer size, power, and form factor. In addition options that were not chosen to be persued are shown.

1 Recommended Configuration

1.1 Overview

The keypoints about the computer chosen for this recomendation is that:

- The CPU processing power is addiquite
- The GPU power is addiquite
- It uses its own powersource and thus does not need to be powered off of DRC-Hubo's battery
- The system is modded to run with full GPU functionality when on battery (not typical for laptops).

The above reasons are why I recomend the comptuer configuration listed below.

1.2 Computational and Electronic Atrobutes

- Brand: System 76
- Model: Bonobo Extreme -*https://www.system76.com/laptops/model/bonx6*
- Processor: 3rd Generation Intel Core i7-3740QM Processor (2.70GHz 6MB L3 Cache - 4 Cores plus Hyperthreading)
- Graphics: nVidia GeForce GTX 680M with 4 GB GDDR5 Memory and 1344 CUDA Cores
- Memory: 32 GB Dual Channel DDR3 SDRAM at 1600MHz - 4 X 8 GB
- Storage: 180 GB Intel 520 Series SATA III 6 Gb/s Solid State Disk Drive
- Networking: Gigabit LAN (10/100/1000), WiFi
- Battery: Extra 89.20 WH 8 Cell Smart Li-ION Battery (3.5 Hour Typical Use)
- Charger: Full Range AC-in 100 240V, 50 60Hz, 90W AC Adapter, DC output 19V, 4.74A

1.3 Physical Attrobutes

- 16.5" x 11.54" x 1.55 1.96" (WxDxH)
- 42.0 cm x 29.5 cm x 4.0 5.0cm (WxDxH)
- 8.60 lbs. (3.90 kg.)

1.4 System 76 Bonobo Extreme - Image

2 Other Non-Recommended Options

2.1 PCIe-104 Comptuer with Adaptor

We could get a PCIe-104 form facor computer with an nVidia graphics card attached (see Sec 2.2). The problem with this option is that there are no PCIe-104 nVidia cards avaliable. We would have to procure an adaptor card for PCIe-104 socket to normal PCIe (see Sec **??**).

2.2 PCIe-104 SBC Options

2.2.1 Beckhoff - CB4055

- CPU: 2.5Ghz i7
- Max Memory: 4 Gb
- Power: 5V (Watt not listed)
- Form Factor: PC-104 - 116 mm x 24 mm x 96 mm

2.2.2 Advanced Digital Logic -ADLQM67PC

- CPU: 3.0Ghz i7
- Max Memory: 8 Gb
- Power: 5V , 12V, 5V Suspend (Watt not listed)
- Form Factor: 4.5 x 3.8 (115mm x 96mm) PCI/104-Express v1.0a

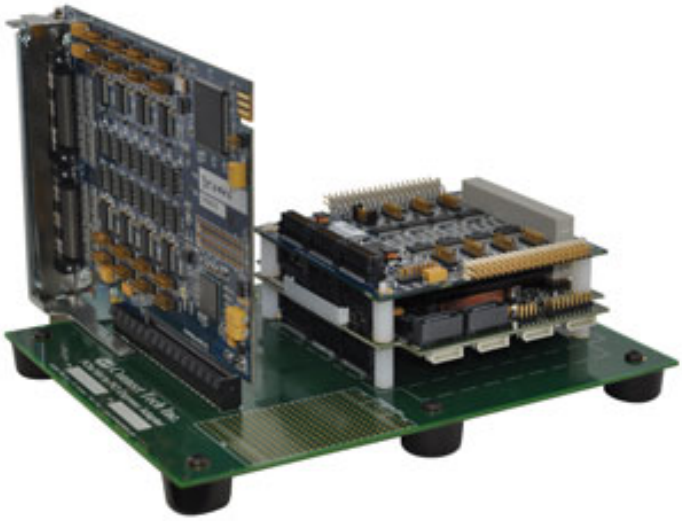
There are others as well. One concern is that my trusted company (Advantech) does not sell i7 PCIe-104 SBCs

2.2.3 PCIe-104 to PCIe Adaptor Card

In order to a PCIe-104 card with a normal graphics card with CUDA enabled we need

- An adaptor
- External power

The adaptor can be something like the *Connect Tech Inc.* PCIe/104 (PCI/104-Express) to PCI Express Adapter:



URL:
http://www.connecttech.com/sub/products/PCI104_Express_PCIe_B_Adapter.asp

2.3 Use Normal Laptop with ExpressCard PCIe Adaptor

This option says to use a ExpressCard Adaptor to connect a typical PCIe video card to a laptop computer. The positive sides of this would be:

- We can use any PCIe graphics card we want
- We can use any laptop with a ExpressCard slot that we want
- This is proven to work in Windows by *Gamers*

The downsides of this option are:

- We need external power for the graphics card
- Linux support for the card is not fully tested

I am currently in the middle of testing using the PE4H-EC2C (PCIe Passive adapter ver2.4 with EC2C ExpressCard).