

## Minutes of Honours Progress Meeting - 20131015

### 1 Attendance

Present:

Benjamin Hugo  
Heinrich Strauss  
Brandon Talbot  
Prof. James Gain  
Prof. Patrick Marais (briefly)

(Prof. James Gain's Office, Building 18, UCT Upper Campus)  
from 12h00 to 13h00

### 2 Agenda

*Progress on Zero-Length Encoder (Heinrich)*

- This at about 4000 words
- Skeleton for most sections
- Draft for style-related comments will be submitted by Thursday
- Need to flesh out implementation
  - need to motivate (strongly) the GPU approach chosen
- Aim for  $\frac{2}{3}$  completion by Monday, 21 October

*Progress on Predictive Encoder (Benjamin)*

- Thesis at about 14000 words
  - Finished most of his discussion chapter
  - Wants to include other team members' results
  - includes feasibility study
- Primary comparison criteria
  - ratio
  - speed
  - memory
- Additional criteria - overheads to consider
  - Copy to/from GPU, disk access, etc.
- Considering LZ in parallel
- About half-way done with entire thesis
  - Testing on GTX 780 (Old Mutual sponsored)
  - Scale number of timestamps to fit memory
  - Predictive kernel @ 13.6 Gbps/
  - Fermi vs. Kepler yields performance of ~6 vs. 13 Gb/s (Hex (M2090) vs. GTX 780)
    - More than double the speed on Kepler vs Fermi.

### *Progress on Arithmetic Encoder (Brandon)*

- Thesis at about 12000 words
- GPU version - swapping and prefix sum
  - Sort kills GPU data ordering (For prefix sums)
  - Copy time reduced to less than 1 second
  - Until Computer 4.0, no double pointers (\*\*var) available in CUDA C.
  - Flattening takes about 3 seconds
  - Only binning on GPU and returning
  - Most of the algorithm is handled on CPU
  - Throughput is 260MB/s (no I/O); 26 MB/s (with I/O included)
  - Compressed data is 41% of input size
- Better than bzip2 in both characteristics (throughput and ratio)
- GPU binning is not parallelisable
- Faster on gaming card (GTX670) than on Hex cluster (higher clock speed)
  - 2-3 second difference (because of atomics)

### *General*

- Hex is choked - jobs wait in queue for more than 24 hours.

## **3 Post Meeting Action Items**

*Action:*            *Submit final drafts for review timeously*

Assigned To: Project Team

Deadline:        21 October 2013

*Action:*            *Decide on thesis weightings*

Assigned To: Project Team

Deadline:        22 October 2013

## **4 Further Meetings**

Next (and final) meeting scheduled for 22 October 2013.