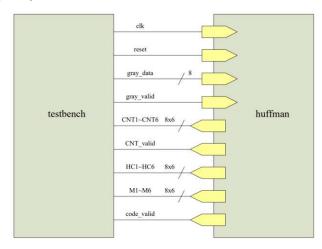
(15) Huffman Coding

甲、摘要

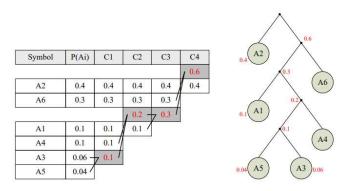
設計一 Huffman Coding 編碼產生器電路,可輸入資料,並依 統計結果產生對應的 Huffman Code 作為輸出,來達成無損壓縮的 可變長度編碼。



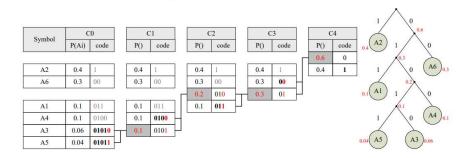
圖一、系統方塊圖

乙、想法

先根據輸入進來的資料統計各 symbol 發生機率,並將其排序。接著依序將機率最低的兩組 combine 在一起,並 re-order,重複步驟建立 Huffman Tree。

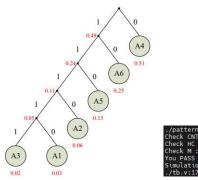


圖二、Huffman Coding 演算法 Combine 階段 接著是對 Huffman Tree(Huffman table)進行 split 的動作,用 Prefix 的技術對其進行 encoding。



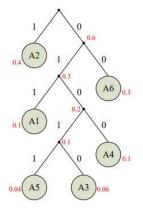
圖三、Huffman Coding 演算法 Split 階段

丙、結果



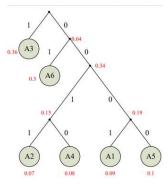
./pattern1.dat and ./golden1.dat were used for this simulation.
Check CNT : PASS
Check H : PASS
Check M : PASS
Check M : PASS
You PASS the contest now.
Simulation complete via \$finish(1) at time 7550 NS + 0
./th.v:175

圖四五、通過測試樣本一



Verdi : End of traversing.
./pattern2.dat and ./golden2.dat were used for this simulation.
Check CNT : PASS
Check HC : PASS
Check HC : PASS
Check M: PASS
You PASS the contest now.
Simulation complete via \$finish(1) at time 7550 NS + 0
./tb.vi.175
\$finish;

圖六七、通過測試樣本二



Verdi : End of traversing.
./pattern3.dat and ./golden3.dat were used for this simulation.
Check CNT : PASS
Check HC : PASS
Check M : PASS
Check M : PASS
You PASS the contest now.
Simulation complete via \$finish(1) at time 7550 NS + 0
./tb.v:175
\$finish:

圖八九、通過測試樣本三