

Errata 1th edition

for the book

Embedded Microprocessor System Design using FPGAs

by

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Preface 1:

Page viii 7th line from top: Remove “only”

Page ix 11th line from top: Replace “TRIC2” with “TRISC2”

Chapter 1:

Page 2 9th line from end: Replace “1960” with “1960s”

Page 2 6th line from end: Replace “1980” with “1980s”

Page 9 within Fig. 1.4: Replace “Extention” with “Extension”

Page 10 second table: Replace “r1 and r0” with “r1 and r0 into r19”

Page 11 second line from end: Replace “STR” with “str”

Page 11 table: Replace “register value 1” with “register r1 value” and “register 0” with “register r0”

Page 12 11th line from top: Replace “LDBU” with “lbdU”

Page 13 last line: Replace “DAT4” with “DAT5”

Page 28 enumerated listing: switch item 5 and 6

Page 28 enumeration item 7: replace “high price range devices have two \$\$” with “medium price range devices have two \$\$, and high price range devices have three \$\$\$”

Page 34 equation (1.6): switch N and M

Page 37 Exercise 1.1: Replace “Plessy” with “Plessey”

Page 39 Exercise 1.43: Replace “NOR gates only” with “two input multiplexer only”

Chapter 2:

Page 49 second line: Replace “E2PROM” with “E²PROM”

Page 56 replace Fig. 2.9 label **a** and **b** with (a) and (b)

Page 64 9th line from top: Replace “highest” with “physical height”

Page 64 second line 2 and 4th line page 67 replace JTEG with JTAG

Page 69 7th line replace “Quartus” with “FPGA design tools”

Page 70 replace 18th line replace URSIC with URISC

Page 72 Program 2.2 16th line replace X"2180" with X"1280"

Page 75 second bullet point: Replace “two-source” with “second-source”

Page 86: Listing 2.7 replace with

```
1  initial // Data read alternative via readmemh
2  begin
3      $readmemh("urisc.hex", rom);
4  end
```

Page 92 Exercise 2.29: “MHZ” with “MHz”

Page 93 Exercise 2.43: Replace “Cyclone V DE1 SoC” with “ZyBo-Z7-20”

Chapter 3:

Page 102 line 8 from end: Replace “ $-2^{31}-1\dots$ ” with “ $-(2^{31}-1)\dots$ ”

Page 113 7th line from top: Replace “`-- reset pc`” with “`-- always start with fetch state`”

Page 118 Exercise 3.22: Replace “two” with “two’s”

Page 119 Exercise 3.41: Same line “`LIBRARY ieee; // Using`” and “predefined packages”

Page 120 Exercise 3.42: Same line “`LIBRARY ieee; // Using predefined`” and “packages”

Page 121 Exercise 3.45: Replace “gray” with “Gray”

Chapter 4:

Page 129 4th line from top: Replace “parenthesis” with “bracket”

Page 129 11th line from top: Replace “X” with “H”

Page 133 first line from top: Replace “form” with “from”

Page 134 6th line from top: Replace “`4B'000`” with “`4'B0000`”

Page 134 4th line from end: Remove “A”

Page 136 4th line from end: Replace “where Sum8 is are 8-bit word and Sum and Sum9 are 9-bit words” with “where Sum8 and Sum are 8-bit words and Sum9 is a 9-bit word”

Page 138 last line: Replace “use” with “us”

Page 144 7th line in Verilog code: Replace “`// all set register to -1`” with “`// always start with fetch state`”

Page 152 Exercise 4.45: Remove “code”

Page 121 Exercise 4.47: Replace “gray” with “Gray”

Chapter 5:

Page 129 20th line from top: Replace “parenthesis” with “bracket”

Page 165 7th line from end: Replace “ $0\dots 2^{B-1}$ ” with “ $0\dots 2^B - 1$ ”

Page 166 12th line from end: Replace “coding Example 5.4” with “Example Program 5.1”

Page 168 first line: Replace “increasing” with “decreasing”

Page 171 6th line from top: Replace “`-, x, /`” with “`-, *, /`”

Page 183 7th line from end: Replace “Drystone” with “Dhrystone”

Page 183 3th line from end: Replace “MWIPS” with “WMIPS”

Page 192 1th line: Replace “ASCII” with “ASCII”

Chapter 6:

Page 201 last line: Replace “ $[^a-b]$ ” with “ $[^a-c]$ ”

Page 214 6th line from end: Replace “code 6.5” with “code 6.3”

Page 217 8th line from end: Replace “`=6`” with “`=-6`”

Page 218 first line: Replace “complier” with “compiler”

Chapter 7:

Page 228 5th line: Replace “It important” with “It’s important”

Page 231 9th line from top: Replace second “type” with “that represents”

Page 231 12th line from top: Replace “, or” with “. Or”

Page 240 5th line before Fig. 7.6: Replace “in in” with “in”

Page 241 Fig. 7.7. caption: Replace “(a)” with “(left)”, “(b)” with “(center)”, “(c)” with “(right)”

Chapter 8:

Page 270-1 Exercise 8.37-8.40: Replace “PCC” with “PCCOMP”

Chapter 9:

- Page 273 Keyword: Replace “JTEG” with “JTAG”
- Page 273 14th line from end: Replace “Fig. 1.8a” with “Fig. 1.7a”
- Page 274 4th line: Replace “Fig. 1.8b” with “Fig. 1.7b”
- Page 275 5th line from end: Replace “Table 5.19” with “Table 5.7”
- Page 277 6th line from end: Replace “Fig. 2.7” with “Fig. 2.4”
- Page 277 2th line from end: Replace “charters” with “characters”
- Page 278 5th line: Replace “HDTV” with “SXGA”
- Page 278 5th line: Replace “Table 2.8” with “Table 2.4”
- Page 282 Table 9.5: Replace “0x04000_0800” with “0x0400_0800”
- Page 291 first line after bullet list: Replace “IEEE standard, 754” with “IEEE 754 standard”
- Page 291 Table 9.9 second row: Replace “33” with “34”
- Page 291 Table 9.9 last row: Replace “even” with “odd”
- Page 293 second line from top: Replace “quite” with “quiet”
- Page 293 last line: Replace “9.41” with “9.65”
- Page 296 11th line from end: Replace “get would” with “would”
- Page 328 Exercise 9.15-9.22: Replace “operation” with “instruction”
- Page 331 Exercise 9.51: Replace “exercise” with “trouble”
- Page 331 Exercise 9.53 and Fig. 9.25: Replace “Douday” with “Douady”
- Page 335 Exercise 9.66: Replace “listing 9.37” with “listing 9.5”
- Page 335 Exercise 9.67(d): Replace “InDA” with “IrDA”
- Page 335 Exercise 9.67(j): Replace “JTEG” with “JTAG”

Chapter 10:

- Page 356 8th line from end: Replace “3.56 GB” with “3.96 Gbits/s”
- Page 370 18th line from top: Remove “test_MY_SWAP-> src->”
- Page 374 11th line from end: Replace “Not all instructions” with “If all instructions”
- Page 375 4th line from top: Replace “R-type” with “A-type”
- Page 391 replace the duplicated lines 145-192 code with the code from lines 193-240:

```

193 load <= ld AND (dma <= DRAMAX4); -- DRAM load
194 write <= st AND (dma > DRAMAX4); -- I/O write
195 read <= ld AND (dma > DRAMAX4); -- I/O read
196 mem_ena <= '1' WHEN store ELSE '0'; -- Active for store only
197 not_clk <= NOT clk;
198 ram: PROCESS (reset, dma, not_clk) -- Use one BRAM: 4096x32
199 VARIABLE idma : U12 := 0;
200 BEGIN
201   idma := CONV_INTEGER('0' & dma(18 TO 29)); --force uns/skip 2 LSBs
202   IF reset = '0' THEN -- Asynchronous clear
203     dmd <= (OTHERS => '0');
204   ELSIF rising_edge(not_clk) THEN
205     IF mem_ena = '1' THEN
206       dram(idma) <= rD; -- Write to RAM at falling clk edge
207     END IF;
208     dmd <= dram(idma); -- Read from RAM at falling clk edge
209   END IF;
210 END PROCESS;
211
212 ALU: PROCESS (rAsxt, rBsxt, in_port, dmd, reset, clk, load, read, C,
213              rDsxt, aai, aac, ooi, xxi, cmp, U, rA, rB)
214 VARIABLE res: STD_LOGIC_VECTOR(0 TO 32);
215 BEGIN
216   res := rDsxt; -- keep old/default
217   IF aai THEN res := rAsxt + rBsxt; END IF;
218   IF aac THEN res := rAsxt + rBsxt + C; END IF;
219   IF ooi THEN res := rAsxt OR rBsxt; END IF;
220   IF xxi THEN res := rAsxt XOR rBsxt; END IF;
221   IF cmp THEN res := rBsxt - rAsxt; -- ok for signed
222     IF U THEN -- unsigned speial case
223       IF ('0' & rA) > ('0' & rB) THEN res(1) := '1';
224     ELSE
225       res(1) := '0';
226     END IF;
227   END IF;
228   IF load THEN res := '0' & dmd; END IF;
229   IF read THEN res := "0" & X"000000" & in_port; END IF;
230 -- Update flags and registers -----
231   IF reset = '0' THEN -- Asynchronous clear
232     LI <= false; C <= '0'; rI <= (OTHERS => '0');
233     out_port <= (OTHERS => '0');
234     FOR k IN 0 TO NR LOOP -- reset to zero
235       r(k) <= conv_std_logic_vector(k,32); --X"00000000";
236     END LOOP;
237   ELSIF rising_edge(clk) THEN
238     IF NOT K THEN -- Compute new C flag for add if Keep=false
239       IF res(0) = '1' AND (aai OR aac) THEN
240         C <= '1';

```

Page 397-8 Exercise 10.17-10.24: Replace “operation” with “instruction”
 Page 400 Exercise 10.52: Replace “Exercise” with “trouble”
 Page 400 Exercise 10.53: Replace “Exercise” with “trouble”
 Page 400 Exercise 10.54 and Fig. 10.25: Replace “Douday” with “Douady”
 Page 405 Exercise 10.70: Replace “JTEG” with “JTAG”
 Page 405 Exercise 10.73: Replace “you” with “your”

Chapter 11:

Page 419 line 10 in Code 11.2: Replace “TODO get timer value” with “Compute elapsed time”
 Page 424 4th line item 7: Replace “looked” with “locked”
 Page 427 2th line from top: Replace “except” with “expect”
 Page 432 Update the comments in Program 11.6 as follows:

```

1      .text                                /* ARM executable code follows */
2      .global      _start
3      _start:
4          mov     r1, #0                    // r1=red LED base address
5          movt    r1, #65312                // r1 + 64 = switches base address
6          ldr     r2, [r1,#64]              // load switches value
7      flash:  str     r2, [r1]              // write to red LEDs
8          movw    r3, #30784                // =25_000_000
9          movt    r3, #381
10     loop:   subs   r3, r3, #1              // delay counter
11          bne     loop
12          mvn     r2, r2                    // toggle/bit inverse
13          b       flash

```

Page 440 Table 11.3 caption: Replace “contend” with “content”
 Page 447 2th line: Replace “pc,” with “pc, ir,”
 Page 447 3th line: Replace “I, jc, and me_ena” with “jc, store, and load”
 Page 447 4th line: Replace “bits” with “bytes”
 Page 454 Exercise 11.55 and Fig. 11.18: Replace “Douday” with “Douady”
 Page 459 Exercise 11.72(e): Replace “JTEG” with “JTAG”
 Page 460 Exercise 11.73(d): Replace “InDA” with “IrDA”
 Page 460 Exercise 11.73(j): Replace “JTEG” with “JTAG”

Appendix B: Glossary:

Page 503 3th line: Replace “(cooperation)” with “(corporation)”
 Page 504 2th line: Replace “(cooperation)” with “(corporation)”