Appendix A

Transistor Sizes and Filter Coefficients

Transistor Type	Transistor	Transistor size
PMOS	MP_1	$\frac{10\mu m}{1\mu m} \times 2$
	MP_2	$\frac{10\mu m}{1\mu m} \times 2$
	MP_3	$\frac{4\mu m}{3\mu m} \times 12$
	MP_4	$\frac{20\mu m}{3\mu m} \times 13$
	MP_5	$\frac{20\mu m}{3\mu m} \times 13$
	MP_6	$\frac{20\mu m}{3\mu m} \times 12$
	MP_{6b}	$\frac{20\mu m}{3\mu m} \times 12$
	MP_7	$\frac{20\mu m}{3\mu m} \times 13$
	MP_8	$\frac{20\mu m}{3\mu m} \times 13$
	MP_9	$\frac{20\mu m}{3\mu m} \times 12$
	MP_{10}	$\frac{20\mu m}{3\mu m} \times 12$
	MP_{11}	$\frac{20\mu m}{3\mu m} \times 12$
	MP_{12}	$\frac{20\mu m}{3\mu m} \times 12$
NMOS	MN_1	$\frac{22\mu m}{1.2\mu m} \times 2$
	MN_2	$\frac{22\mu m}{1.2\mu m} \times 2$
	MN_{1a}	$\frac{22\mu m}{1.2\mu m} \times 2$
	MN_{2a}	$\frac{22\mu m}{1.2\mu m} \times 2$

Table A.1 Transistor sizes of the transconductor in Fig. 3.4

Transistor Type	Transistor	Transistor size
PMOS	MP_1	$\frac{50\mu m}{4\mu m} \times 1$
	MP_2	$\frac{30\mu m}{1\mu m} \times 2$
	MP_3	$\frac{30\mu m}{1\mu m} \times 2$
	MP_{b1}	$\frac{10\mu m}{1\mu m} \times 4$
	MP_{b2}	$\frac{10\mu m}{1\mu m} \times 4$
	MP_{s1}	$\frac{20\mu m}{1\mu m} \times 1$
	MP_{s2}	$\frac{2\mu m}{1\mu m} \times 1$
	MP_{du}	$\frac{1\mu m}{1\mu m} \times 1$
NMOS	MN_1	$\frac{50\mu m}{14\mu m} \times 1$
	MN_2	$\frac{30\mu m}{1\mu m} \times 1$
	MN_3	$\frac{30\mu m}{1\mu m} \times 1$
	MN_{b1}	$\frac{5\mu m}{1\mu m} \times 4$
	MN_{b2}	$\frac{5\mu m}{1\mu m} \times 4$
	MN_{s1}	$\frac{5\mu m}{1\mu m} \times 1$
	MN_{s2}	$\frac{2\mu m}{1\mu m} \times 1$
	MN_{du}	$\frac{1\mu m}{1\mu m} \times 1$
Transmission gate	S_{3a}, NMOS	$\frac{5\mu m}{1\mu m} \times 2$
	S_{3a}, PMOS	$\frac{10\mu m}{1\mu m} \times 2$
	S_{3b}, NMOS	$\frac{5\mu m}{1\mu m} \times 2$
	S_{3b}, PMOS	$\frac{10\mu m}{1\mu m} \times 2$
	S_4, NMOS	$\frac{5\mu m}{1\mu m} \times 2$
	S_4, PMOS	$\frac{10\mu m}{1\mu m} \times 2$
	S_5, NMOS	$\frac{5\mu m}{1\mu m} \times 2$
	S_5, PMOS	$\frac{10\mu m}{1\mu m} \times 2$

Table A.2 Transistor sizes of the memory cell in Fig. 3.15

Table A.3 8-bit quantized coefficients with 1 sign bit employed in the 8 test data sets

Coefficients	Test set			
	1	2	3	4
$h0$	+00001010	+00000111	+00001111	−00000100
$h1$	+00001110	+00001111	−00011010	−00100011
$h2$	−00000111	−00001111	−00010110	+00001000
$h3$	−00001101	+00000101	−00001111	+00010000
$h4$	−00001111	+00010000	+00000001	−00001011
$h5$	+00001100	−00011101	+00011010	−00011011
$h6$	+00110101	+00000100	+00110100	+00100001
$h7$	+01010101	+10001010	+01000100	+01110111
$h8$	+01010101	+10001010	+01000100	+01110111
$h9$	+00110101	+00000100	+00110100	+00100001
$h10$	+00001100	−00011101	+00011010	−00011011
$h11$	−00001111	+00010000	+00000001	−00001011
$h12$	−00001101	+00000101	−00001111	+00010000
$h13$	−00000111	−00001111	−00010110	+00001000
$h14$	+00001110	+00001111	−00011010	−00100011
$h15$	+00001010	+00000111	+00001111	−00000100

Coefficients	Test set			
	5	6	7	8
$h0$	+00000010	+00010010	+00001101	+11111111
$h1$	−00010100	+00000100	−00000110	+00000000
$h2$	−00000010	−00001101	+00000101	+00000000
$h3$	+00010000	−00100000	+00001010	+00000000

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Coefficients	Test set			
	5	6	7	8
$h4$	−00000101	−00100100	−00011100	+00000000
$h5$	−00011101	−00010000	−01000010	+00000000
$h6$	+00011100	+00010001	−00010010	+00000000
$h7$	+01111011	+00101100	+01001001	+00000000
$h8$	+01111011	+00101100	+01001001	+00000000
$h9$	+00011100	+00010001	−00010010	+00000000
$h10$	−00011101	−00010000	−01000010	+00000000
$h11$	−00000101	−00100100	−00011100	+00000000
$h12$	+00010000	−00100000	+00001010	+00000000
$h13$	−00000010	−00001101	+00000101	+00000000
$h14$	−00010100	+00000100	−00000110	+00000000
$h15$	+00000010	+00010010	+00001101	+00000000