

# Сумматор Линга Скланского, Radix-2, 16-ти битный

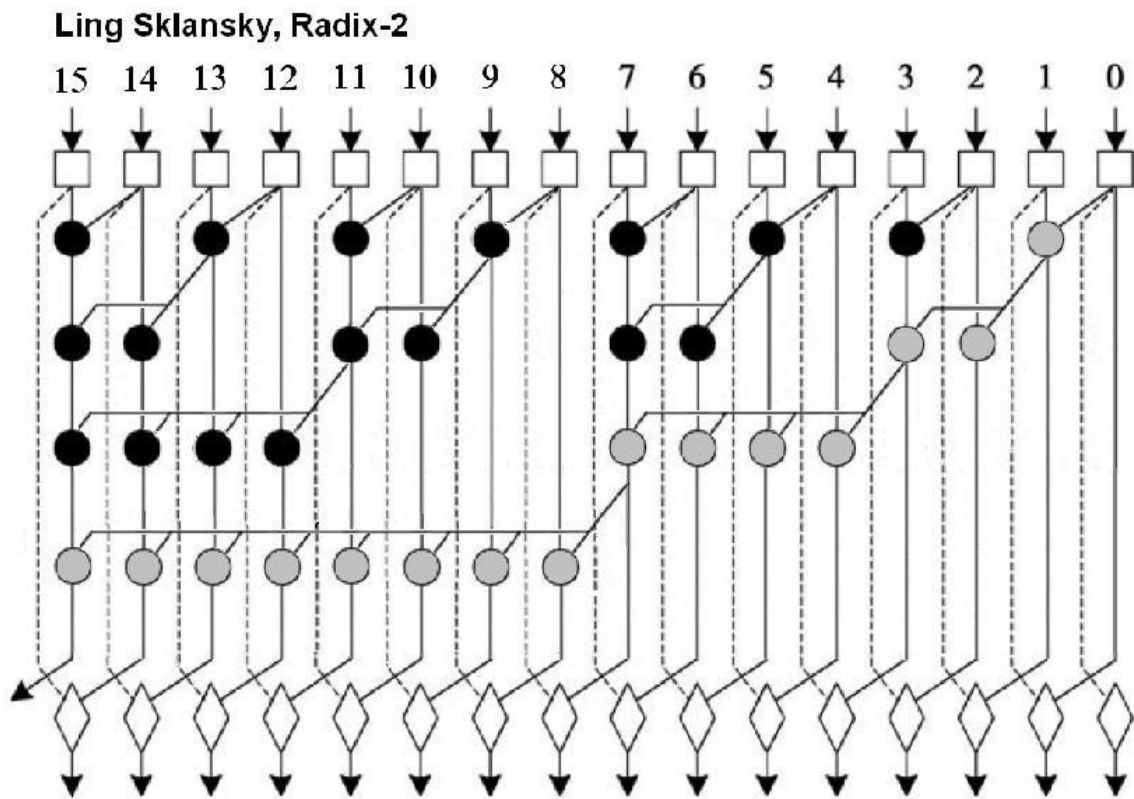


Рис.1. Граф сумматора Линга Скланского, Radix-2, 16-ти разрядного [1].

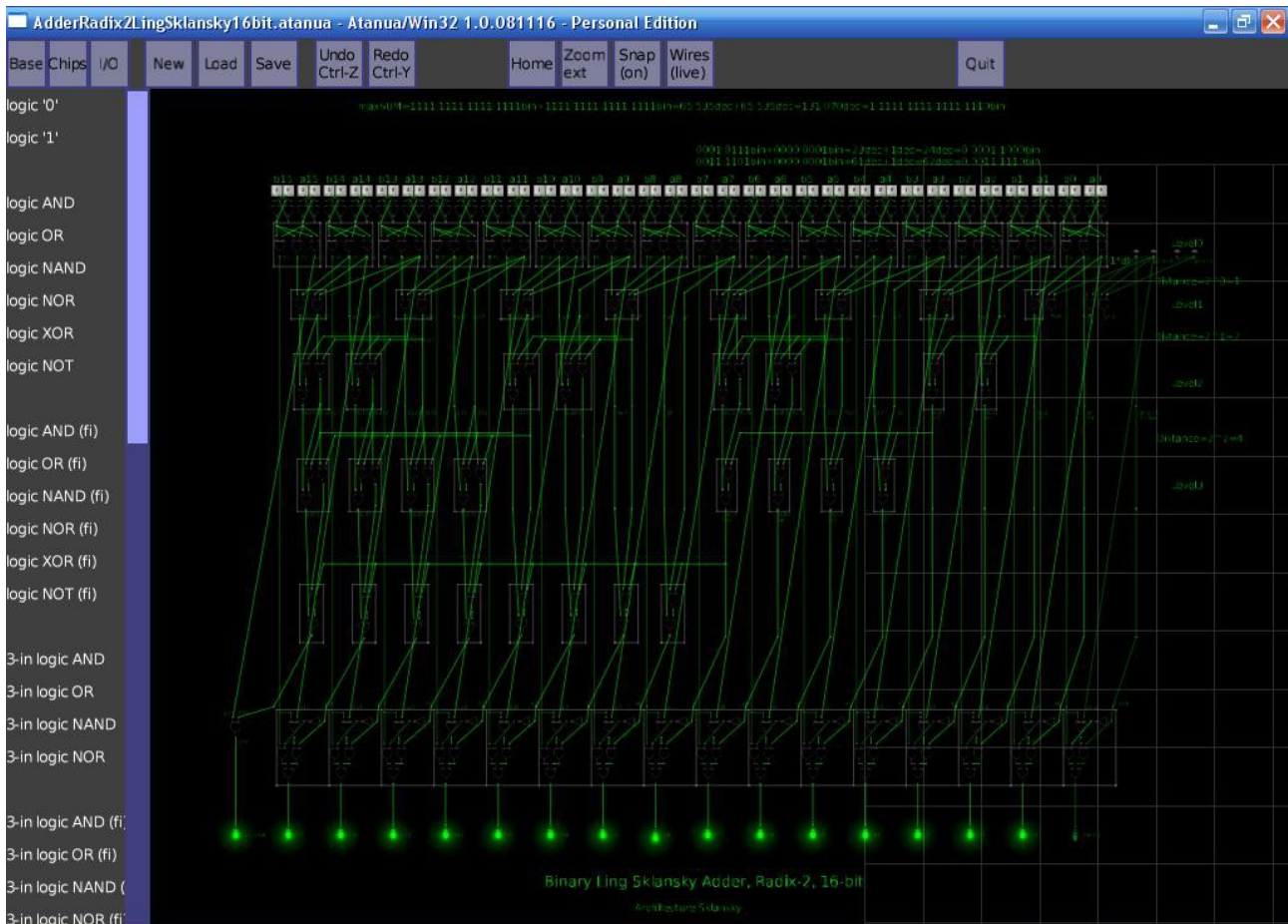


Рис.2. Снимок модели сумматора Линга, архитектура Склянского, Radix-2, 16-ти битного (2-х байтного) в логическом симуляторе [Atanua/Win32 1.0.081116 - Personal Edition](http://andserkul.narod.ru/Atanua/Win32 1.0.081116 - Personal Edition).

Код модели сумматора Линга Склянского, Radix-2, 16-ти битного (2-х байтного) в логическом симуляторе Atanua/Win32:  
<http://andserkul.narod.ru/AdderRadix2LingSklyansky16bit.atanua>

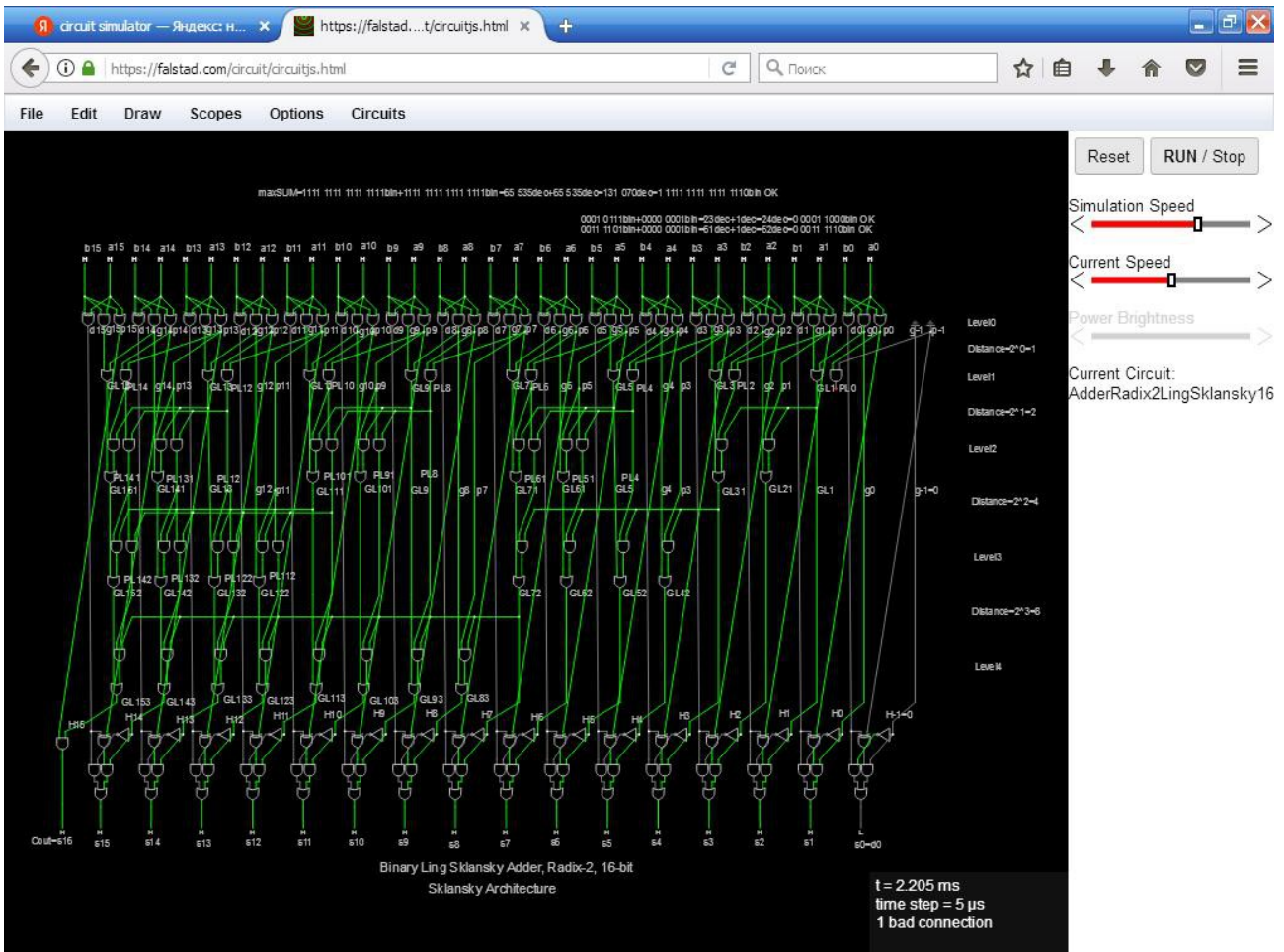


Рис.3. Снимок модели сумматора Линга, архитектура Склянского, Radix-2, 16-ти битного (2-х байтного) в Circuit Simulator'e.

Код модели в Circuit Simulator'e:  
<http://andserkul.narod.ru/AdderRadix2LingSklyansky16bit.noext>

Сумматор Линга Склянского, Radix-2, 16-ти битный (2-х байтный), в виде системы логических уравнений:

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'Level0-----Warning-----
p0 = a0 OR  b0      'Initial only CLA & Ling Propagate (not in PPA)
g0 = a0 AND b0      'Initial CLA & Ling & PPA Generate
d0 = a0 XOR  b0      'Only Ling Initial half bit generate (p0 in PPA)

p1 = a1 OR  b1
g1 = a1 AND b1
d1 = a1 XOR  b1

p2 = a2 OR  b2
g2 = a2 AND b2
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d2 = a2 XOR b2

p3 = a3 OR b3

g3 = a3 AND b3

d3 = a3 XOR b3

p4 = a4 OR b4

g4 = a4 AND b4

d4 = a4 XOR b4

p5 = a5 OR b5

g5 = a5 AND b5

d5 = a5 XOR b5

p6 = a6 OR b6

g6 = a6 AND b6

d6 = a6 XOR b6

p7 = a7 OR b7

g7 = a7 AND b7

d7 = a7 XOR b7

p8 = a8 OR b8

g8 = a8 AND b8

d8 = a8 XOR b8

p9 = a9 OR b9

g9 = a9 AND b9

d9 = a9 XOR b9

p10 = a10 OR b10

g10 = a10 AND b10

d10 = a10 XOR b10

p11 = a11 OR b11

g11 = a11 AND b11

d11 = a11 XOR b11

p12 = a12 OR b12

g12 = a12 AND b12

d12 = a12 XOR b12

p13 = a13 OR b13

g13 = a13 AND b13

d13 = a13 XOR b13

p14 = a14 OR b14

g14 = a14 AND b14

d14 = a14 XOR b14

p15 = a15 OR b15

g15 = a15 AND b15

d15 = a15 XOR b15

'Level1-----Distance=2^0=1

'(G,P)=(g,p) o (g,p)=(g,p)

'GLi=gi OR gi-1

'PLi=pi AND pi-1 (9) 'Distance=1

GLm1 = 0 'for k<0

PLm2 = 0 'for k<0

'(GL0,PLm1)

GL0 = g0 OR gm1

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PLm1=0                                'for k<0

'(GL1,PL0)
GL1 = g1 OR g0
PL0 = p0 AND pm1                       'Distance=1

'(GL3,PL2)
GL3 = g3 OR g2
PL2 = p2 AND p1                       'Distance=1

'(GL5,PL4)
GL5 = g5 OR g4
PL4 = p4 AND p3

'(GL7,PL6)
GL7 = g7 OR g6
PL6 = p6 AND p5

'(GL9,PL8)
GL9 = g9 OR g8
PL8 = p8 AND p7

'(GL11,PL10)
GL11 = g11 OR g10
PL10 = p10 AND p9

'(GL13,PL12)
GL13 = g13 OR g12
PL12 = p12 AND p11

'(GL15,PL14)
GL15 = g15 OR g14
PL14 = p14 AND p13

'Level2-----Distance=2^1=2
'(G,P)=(g,p) o (g',p') = (g OR (p AND g'),p AND p')
'G=g OR (p AND p')
'P=      p AND p'

'(g2,p1) o (GL1,PLm1)
GL21 = g2 OR (p1 AND GL1)

'(GL3,PL2) o (GL1,PL0)
GL31 = GL3 OR (PL2 AND GL1)

'(g6,p5) o (GL5 AND PL4)
GL61 = g6 OR (p5 AND GL5)
PL51 = p5 AND PL4

'(GL7,PL6) o (GL5,PL4)
GL71 = GL7 OR (PL6 AND GL5)
PL61 = PL6 AND PL4

'(g10,p9) o (GL9,PL8)
GL101 = g10 OR (p9 AND GL9)
PL91 = p9 AND PL8

'(GL11,PL10) o (GL9,PL8)
GL111 = GL11 OR (PL10 AND GL9)
PL101 = PL10 AND PL8

'(g14,p13) o (GL13,PL12)
GL141 = g14 OR (p13 AND GL13)
PL131 = p13 AND PL12

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'(GL15,PL14) o (GL13,PL12)
GL151 = GL15 OR (PL14 AND GL13)
PL141 = PL14 AND PL12

'Level3-----Distance=2^2=4
'(g4,p3) o (GL31,PL1)?
GL42 = g4 OR (p3 AND GL31)          'Distance=4

'(GL5,PL4) o (GL31,PL1)
GL52 = GL5 OR (PL4 AND GL31)       'Distance=4

'(GL6,PL5) o (GL31,PL1)
GL62 = GL61 OR (PL51 AND GL31)     'Distance=4

'(GL7,PL6) o (GL31,PL1)
GL72 = GL71 OR (PL61 AND GL31)     'Distance=4

'(g12,p11) o (GL111,PL101)
GL122 = g12 OR (p11 AND GL111)     'Distance=4
PL112 = p11 AND PL101

'(GL13,PL12) o (GL111,PL101)
GL132 = GL13 OR (PL12 AND GL111)   'Distance=4
PL122 = PL12 AND PL101

'(GL141,PL131) o (GL111,PL101)
GL142 = GL141 OR (PL131 AND GL111) 'Distance=4
PL132 = PL131 AND PL101

'(GL151,PL141) o (GL111,PL101)
GL152 = GL151 OR (PL141 AND GL111) 'Distance=4
PL142 = PL141 AND PL101

'Level4-----Distance=2^3=8
GL83 = g8 OR (p7 AND GL72)

GL93 = GL9 OR (PL8 AND GL72)

GL103 = GL101 OR (PL91 AND GL72)

GL113 = GL111 OR (PL101 AND GL72)

GL123 = GL122 OR (PL112 AND GL72)

GL133 = GL132 OR (PL122 AND GL72)

GL143 = GL142 OR (PL132 AND GL72)

GL153 = GL152 OR (PL142 AND GL72)

'Ling PsevdoCarry (H)-----
Hm1 = GLm1          'Ling PsevdoCarry

H0 = g0            'Ling PsevdoCarry

H1 = GL1           'Ling PsevdoCarry

H2 = GL21

H3 = GL31

H4 = GL42

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H5 = GL52
H6 = GL62
H7 = GL72
H8 = GL83
H9 = GL93
H10 = GL103
H11 = GL113
H12 = GL123
H13 = GL133
H14 = GL143
H15 = GL153

'SUM-----
'si=(/Hi-1 AND di) OR (Hi-1 AND (di XOR pi-1))

s0 = ((1-Hm1) AND d0) OR (Hm1 AND (d0 XOR pm1)) 's0=d0
s1 = ((1-H0) AND d1) OR (H0 AND (d1 XOR p0))
s2 = ((1-H1) AND d2) OR (H1 AND (d2 XOR p1))
s3 = ((1-H2) AND d3) OR (H2 AND (d3 XOR p2))
s4 = ((1-H3) AND d4) OR (H3 AND (d4 XOR p3))
s5 = ((1-H4) AND d5) OR (H4 AND (d5 XOR p4))
s6 = ((1-H5) AND d6) OR (H5 AND (d6 XOR p5))
s7 = ((1-H6) AND d7) OR (H6 AND (d7 XOR p6))
s8 = ((1-H7) AND d8) OR (H7 AND (d8 XOR p7))
s9 = ((1-H8) AND d9) OR (H8 AND (d9 XOR p8))
s10 = ((1-H9) AND d10) OR (H9 AND (d10 XOR p9))
s11 = ((1-H10) AND d11) OR (H10 AND (d11 XOR p10))
s12 = ((1-H11) AND d12) OR (H11 AND (d12 XOR p11))
s13 = ((1-H12) AND d13) OR (H12 AND (d13 XOR p12))
s14 = ((1-H13) AND d14) OR (H13 AND (d14 XOR p13))
s15 = ((1-H14) AND d15) OR (H14 AND (d15 XOR p14))
c16 = p15 AND H15 'Cout=c16

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**Программа проверки системы логических уравнений сумматора Линга  
 Склянского, Radix-2, 16-ти битный (2-х байтный), на TurboBasic'e:**  
<http://andserkul.narod.ru/R2LSK16B.bas>

Литература:

1. [High-Speed Parallel-Prefix VLSI Ling Adders. Giorgos Dimitrakopoulos and Dimitris Nikolos.](#)
2. [Сумматор Линга Склянского, Radix-2, 4-х битный, логический и CMOS. Куликов А. С.](#)
3. [Сумматор Линга Склянского, Radix-2, 8-ми битный, Куликов А.С.](#)
4. [Сумматор Линга Когге-Стоуна, Radix-2, 4-х битный. Куликов А.С.](#)
5. [Сумматор Линга Когге-Стоуна, Radix-2, 8-ми битный. Куликов А.С.](#)
6. [Сумматор Линга Когге-Стоуна, Radix-2, 16-ти битный. Куликов А.С.](#)

Приложение 1.

[TurboBasic 1.0](#)

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