CORDIC Background (4A)

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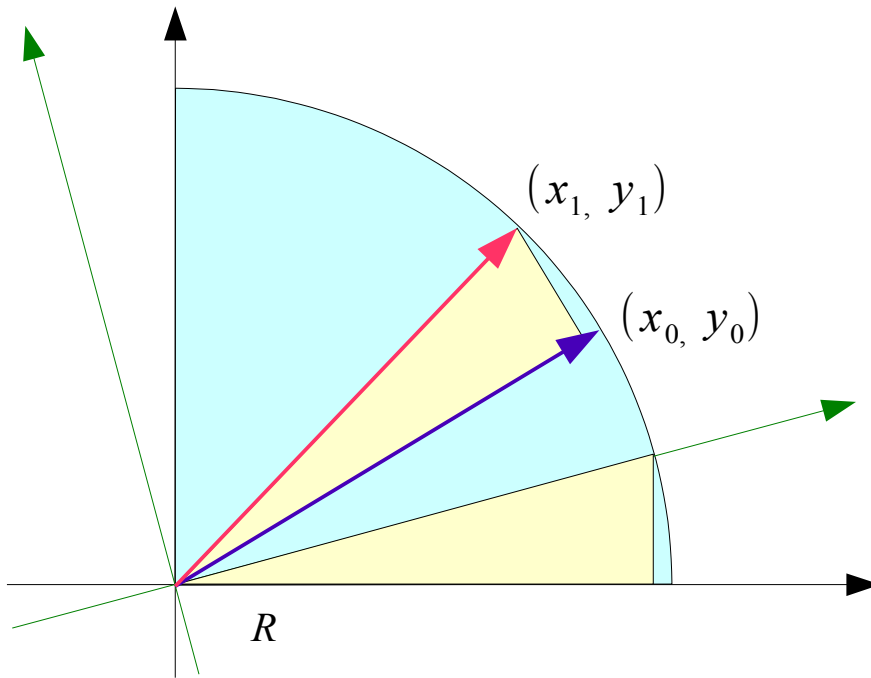
Young Won Lim
01/31/2012

Please send corrections (or suggestions) to youngwlim@hotmail.com.

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CORDIC Background
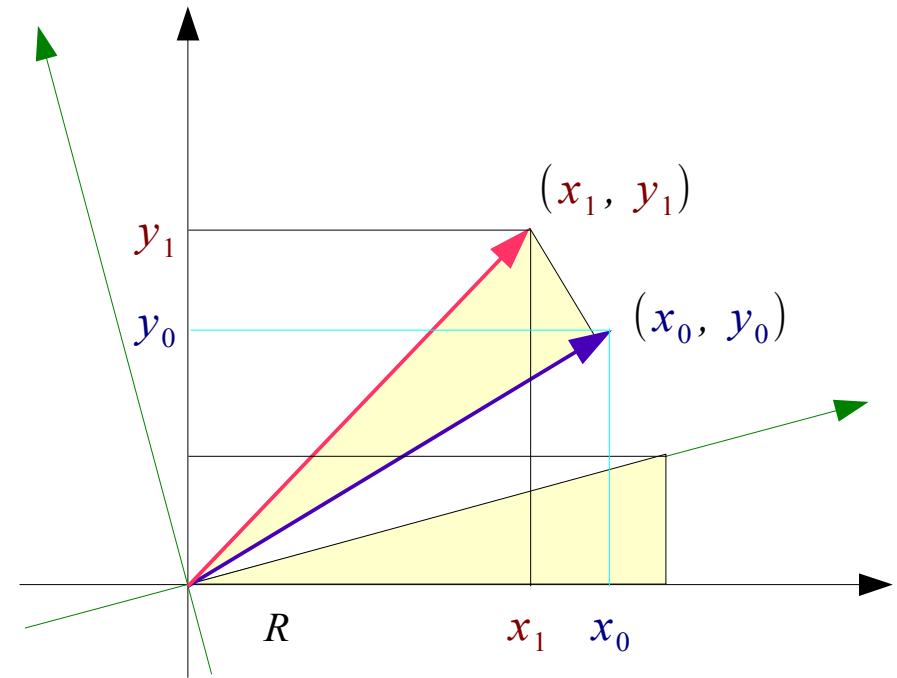
J. P. Deschamps, G. A. Bioul, G.D. Sutter, Synthesis of Arithmetic Circuits

Young Won Lim
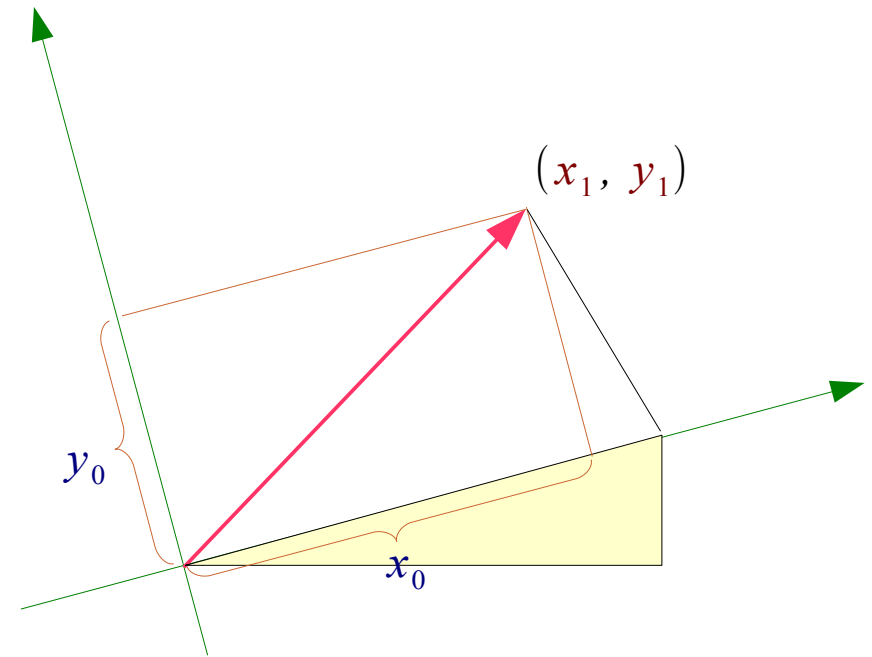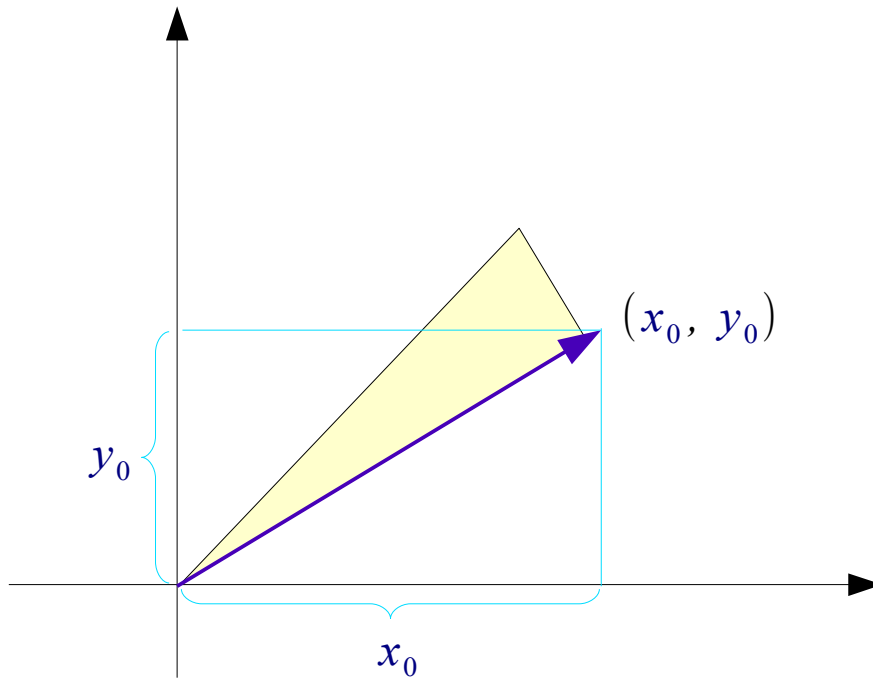01/31/2012

Vector Rotation (1)

$$y_1 = x_0 \sin \alpha + y_0 \cos \alpha$$

(x_1, y_1)

(x_0, y_0)

R

(x_1, y_1)

y_1

y_0

(x_0, y_0)

R

x_1 x_0
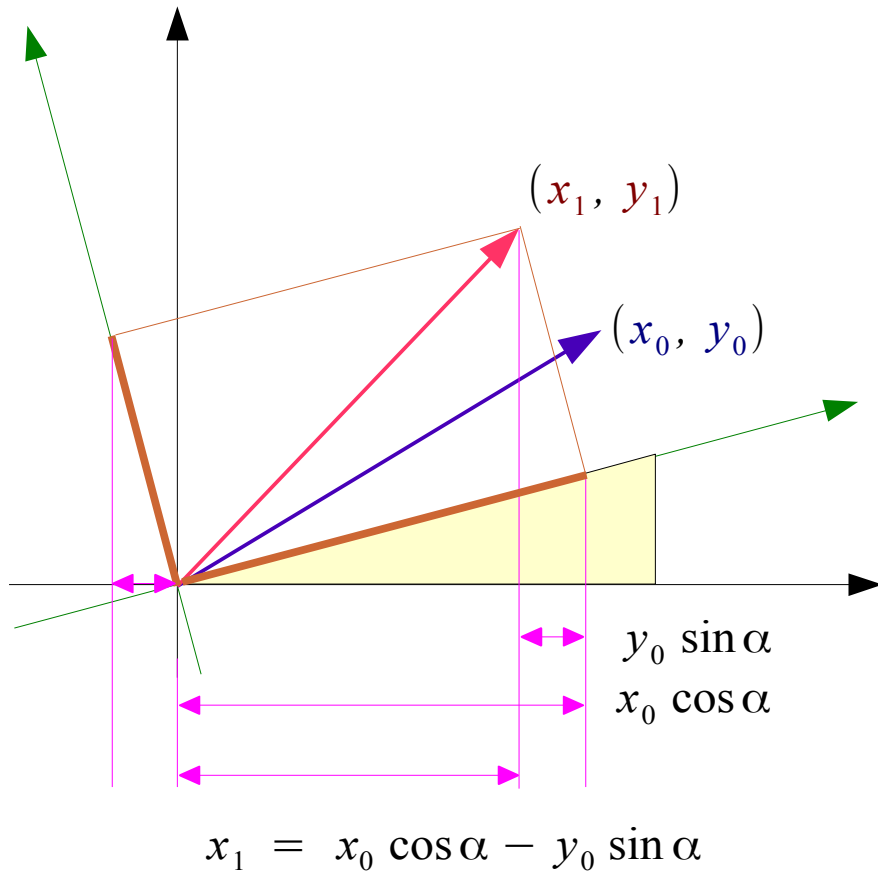
$$x_1 = x_0 \cos \alpha - y_0 \sin \alpha$$

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01/31/2012

Vector Rotation (2)

(x_0, y_0)

y_0

x_0

(x_1, y_1)

y_0

x_0

Vector Rotation (3)

$$x_1 = x_0 \cos\alpha - y_0 \sin\alpha$$

$$y_1 = x_0 \sin\alpha + y_0 \cos\alpha$$
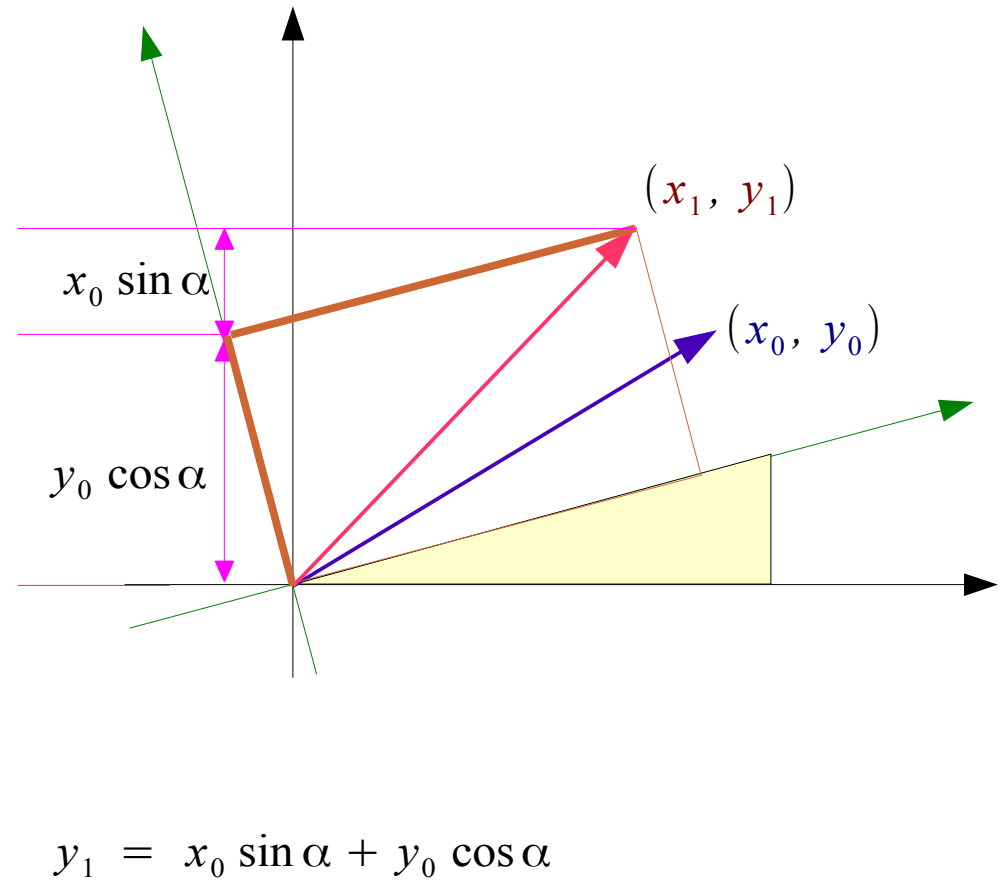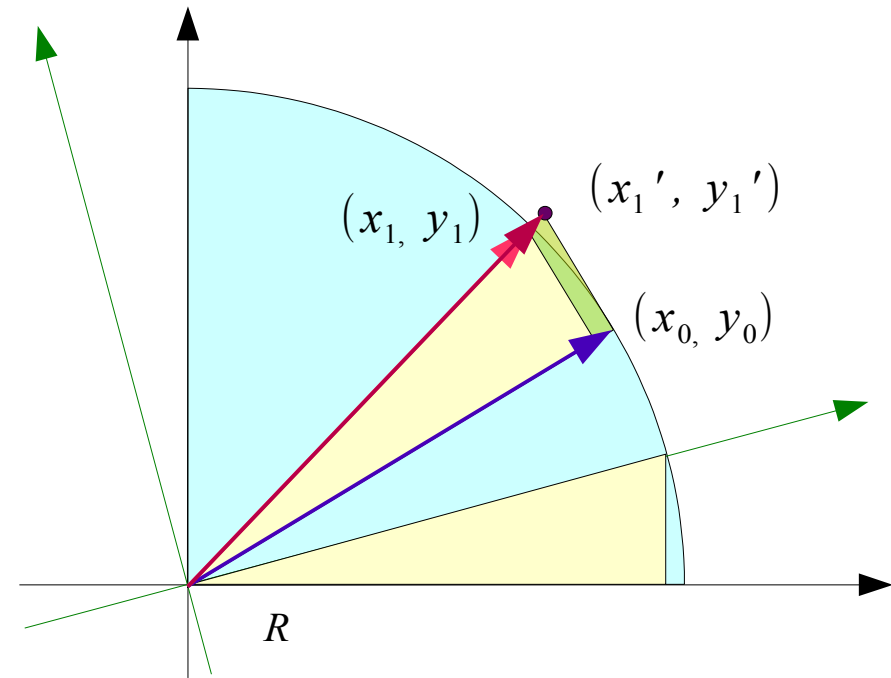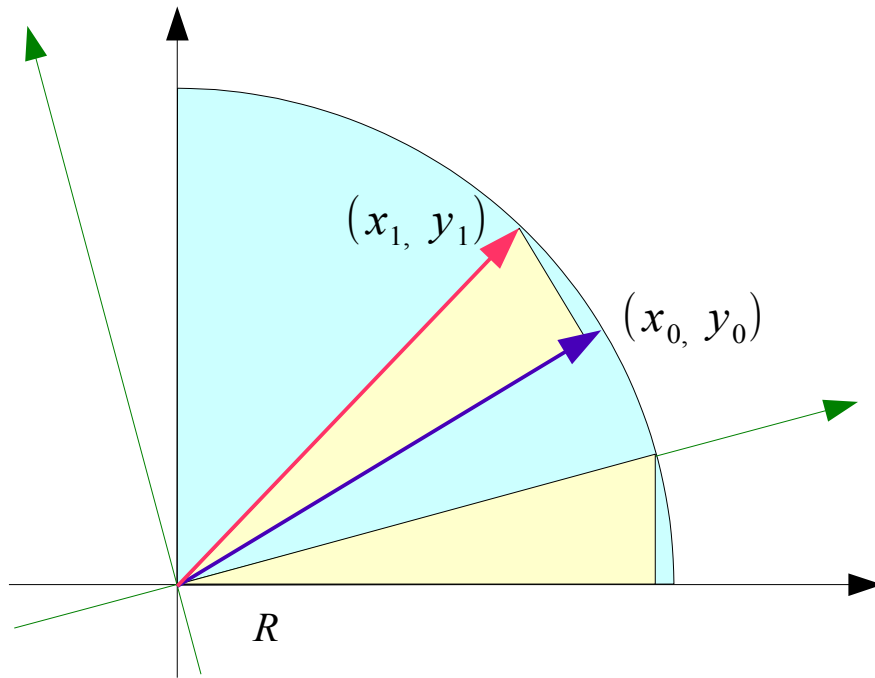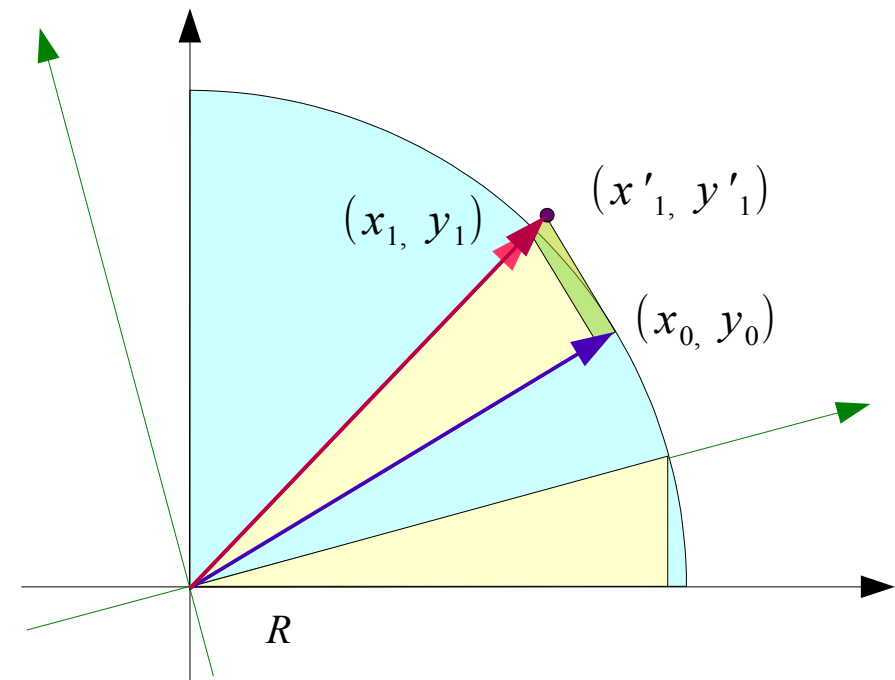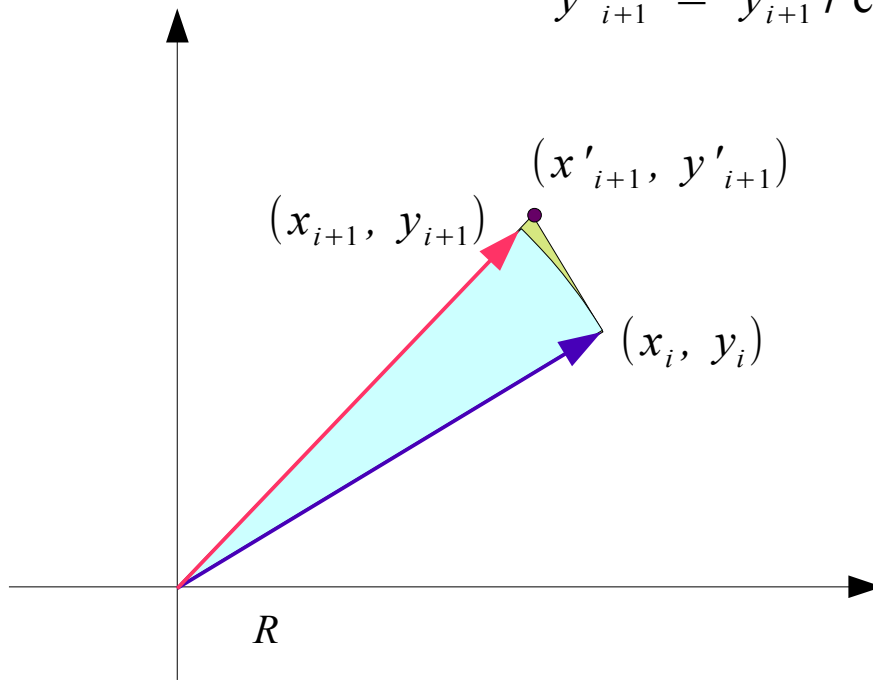
Pseudo-rotation (4)

Pseudo-rotation

$$x'_{i+1} = x_{i+1} / \cos \alpha_i$$
$$y'_{i+1} = y_{i+1} / \cos \alpha_i$$

Unified CORDIC Iteration Eq

References

[1] http://en.wikipedia.org/
[2] CORDIC FAQ, www.dspguru.com
[3] R. Andraka, A survey of CORDIC algorithms for FPGA based computers
[4] J. S. Walther, A Unified Algorithm for Elementary Functions
[5] J. P. Deschamps, G. A. Bioul, G.D. Sutter, Synthesis of Arithmetic Circuits