Binary Angle Measurement (5A)

- Adaptive CORDIC
-

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

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BAM Background

T.K. Rodrigues, "Adaptive CORDIC: Using Parallel Angle Recording to Accelerate Rotations", IEEE Trans on Computers, 2010

Rotation of 25 degree

Original CORDIC

$$25° \approx \quad +45°$$
$$-26.565°$$
$$+14.036°$$
$$-7.125°$$
$$-3.576°$$
$$+1.79°$$
$$+0.895°$$
$$+0.448°$$
$$+0.2238°$$

$$= \ 25.1268°$$

Angle Constants that is used

$$Q \ = \ \{45°, 26.565°, 14.036°, 7.125°, 3.576°, 1.79°, 0.895°, 0.448°, 0.2238°\}$$

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Vector Rotation (2)

Vector Rotation (3)

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Successive Rotations

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CORDIC Rotation

cos θ in term of tan θ

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
[6] T.K. Rodrigues, "Adaptive CORDIC: Using Parallel Angle Recording to Accelerate
        Rotations", IEEE Trans on Computers, 2010