Embedded distributed arithmetic based quaternions multiplier of paraunitary filter bank for lossless-to-lossy image coding

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2017

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Keywords: Quaternion, Filter bank, Distributed arithmetic, FPGA Embedded processor.

Abstract: This paper presents a systematic design of the integer-to-integer invertible quaternionic multiplier based on the block-lifting structure and pipelined embedded processor of the given multiplier using distributed arithmetic (DA) as a block of M-band linear phase paraunitary filter banks (LP PUFB) based on the quater- nionic algebra (Q-PUFB) for the lossy-to-lossless image coding. A bank Q-PUFB based on the DA block- lifting structure reduces the number of rounding operations and has a regular layout. Since the block-lifting structures with rounding operations can implement the integer-to-integer transform (Int-Q-PUFB).

Published in: Microprocessors and Microsystems, Vol.52, pp. 510-522 – 2017. – DOI: 10.1016/j.micpro.2017.04.020.

Internet link:

http://www.sciencedirect.com/science/article/pii/S0141933116304689?via%3Dihub

https://doi.org/10.1016/j.micpro.2017.04.020