


Comments on “A Two-Stage Representation of DFT and Its Applications”

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Abstract—This correspondence contains comments on and several corrections to a recently published TRANSACTIONS paper.

In the above paper, Ersoy developed a two-stage representation in terms of preprocessing and postprocessing of DFT by vector transformation of sines and cosines into new basis functions using Mobius inversion of number theory. This comment points out first that the inversion Mobius transform pair, (A.3) and (A.4), used are valid only when f is a positive rational number [1, p. 208]. Thus, (A.6) should read

\[
X(f) = \frac{1}{4\pi} \sum_{m=1}^{N} x_m \left( \sum_{n=0}^{N-1} 2 \left( \frac{n}{N} \right) - x \left( \frac{n}{2} \right) \right)
\]

and \(f > 0\). Second, (2.11) should read

\[
n! = 0, 1, \ldots, M_l - 1.
\]

Finally, some typing errors are listed below.

1) Equation (A.16) should read

\[
h(l) = \sum_{i=0}^{N-1} x(k) \left[ \mu \left( \frac{k}{N} \right) + \frac{1}{4} \right] - J_\mu \left( \frac{k}{N} \right).
\]

2) The term \(b(4, 16)\) used in the lowest block of (2.13) should be replaced by \(b(9, 16)\).

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4) Equation (A.16) should read

\[
b(m, N) = P(m_1(N), N) - P(m_2(N - 1), N).
\]

REFERENCES
