$$y(n,m)\frac{1}{\prod_{i=0}^{n} a'(i) \prod_{j=0}^{m} a''(j)}.$$

The equivalence is shown in Fig. 11(a) and 11(b).

Similar to Theorem 2, we can state and prove the following result: if a digital filter F is realized using the two dimensional generalized delay elements in which $a'_k(n)$ and $a''_l(m)$ are not necessarily the same, then F can be replaced by F' as shown in Fig. 11(b). In each of these generalized two-dimensional delay elements, $a'_k(n)$ is replaced by $f'(n)a'_k(n)$ and $a''_l(m)$ by $f''(m)a''_l(m)$ to realize F'. Then Fig. 12(b) is equivalent to Fig. 12(a).

IV. Conclusion

A new transform that is useful for the analysis of linear, time-varying (shift-variant) digital filters containing the generalized delay elements, as defined in earlier pages, constant multipliers and adders is proposed and some properties of the transform are derived. The algorithm based on Theorem 1 for computing the response of such filters is very simple.

This algorithm can also be used to synthesize time-varying digital filters from given input–output relationship by reducing the problem to that of synthesizing time-invariant digital filters.

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Comment on "Active Simulation of Grounded Inductors Using a Single Current Conveyor"

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In the above paper,[1] a grounded inductor realization using a single current conveyor has been presented. The proposed circuit is well known and has been published three years ago [1]. The analysis as given in the above paper[1] with $h \neq 1$ as well as the sensitivity analysis were not given in [1] but this is something any interested reader can derive himself.

References

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