

TIE-50406 DSP Implementations

Jarmo Takala

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Calculators and dictionaries are allowed

1. Explain shortly:

- recursive DFG
- M-level pipelined system
- feed-forward cutset
- SDFG
- base of a floating point system
- precedence constraint in data flow graphs

2. Convergent rounding. What does it mean and why it is used? Provide examples.

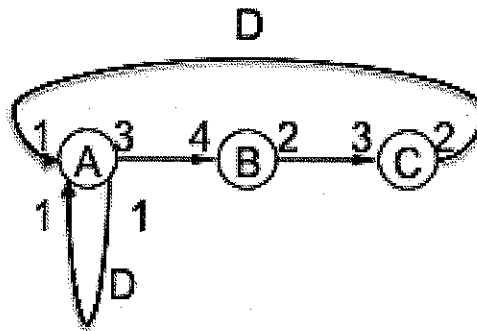
3. A linear systems is described with the following equations:

$$w(n) = x(n) + a_1w(n-1) + a_2w(n-3)$$

$$z(n) = b_1w(n) + b_2w(n-2).$$

Assume that multiplication takes 3x time compared to addition. Draw the corresponding data flow graph. What is the maximum clock frequency for such a system when applying retiming?

4. a) Draw a single rate data flow graph corresponding to the multi rate data flow graph below. B) Draw the corresponding signal flow graph.



5. Folding: why folding is used? What is the difference between retiming and folding?