

Arithmetic addition and subtraction function of logarithmic number system in positive region: An investigation

Abstract

Logarithmic number system or LNS has become an optimal choice in digital image processing instead of floating point (FP) system based on latest researches in LNS. Digital image processing which deals with a lot of complex operations such as multiplication and division, makes LNS as a great choice of implementation. However, the implementation had been restricted by the addition and subtraction function in LNS arithmetic as these functions entail complex procedures and circuitry. As its huge potential to be a substitution of FP, there is an urgent need for LNS to improve the performance of both operations. Hence, various studies had been conducted in this area, however most of the research concern the implementation of these operations in the negative region. Therefore, this study is conducted with the objective on the exploration of both LNS addition and subtraction operations in the positive region and highlights the potential areas for design modifications and improvements. Then, these enhancements will be combined with other arithmetic functions in creating an optimum LNS design to be utilized in any digital image processing system.

Keywords

Addition; Arithmetic; Digital image processing; Logarithmic number system; Subtraction