

Applying the difference term approach for low frequency Biomedical filter applications

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Low frequency continuous time filter is an essential analog block in biomedical applications. Integrating such filter which has large time constants is difficult as it requires large component values. A novel approach to scale the pole frequency is presented. A 5-bit reduction in the cut off frequency is achieved. This is made possible through adding a passive resistor in the forward path of the opamp based integrator introducing a difference term of the pole frequency. Also, the filter topology is modified to avoid changing the quality factor. As an example, a Tow-Thomas 2nd order low pass filter is designed and simulated. Simulation results show that the pole frequency is scaled down from 1.43MHz to 4.97kHz while maintaining tuning of 20% around the nominal value by only controlling one resistor.

Biography

Yaqub Mahnashi has obtained his BSc with honors from King Fahd University of Petroleum and Minerals in 2010. He is currently working for MSc degree with thesis entitle of "CMOS Circuit Techniques for Biomedical Applications" under the supervision of Prof. Hussain Alzahr. He is the founding director of graduate student electronics group gathering in KFUPM.

Hussain A. Alzahr received his Ph.D. degree from Ohio State University, Columbus, in 2001. Professor Alzahr's research interests include applications of electronic circuit techniques for wireless communications and biomedical instrumentation systems. He is the author and coauthor of more than 60 journal papers.

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