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Power line interference noise cancellation in ECG using Zero Phase IIR Notch filtering

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ABSTRACT

The presence of powerline interference noise in ECG signal degrades the quality of signal, which may alter the original characteristics of the ECG signal. In this paper digital IIR notch filter with zero phase filtering technique is proposed to eliminate the powerline interference noise in the ECG signal. There after correlation coefficient is calculated between the filtered ECG signal and standard input ECG signal for its validation. The quality factor of digital notch filter is also tuned to achieve the better correlation coefficient and SNR of filtered ECG signal. We found highest correlation coefficient of 1 and lowest coefficient of 0.9999 at quality factor of 1 and 3 respectively. Further this method is validated on MIT-BIH arrhythmia database.

Keywords—Powerline Interference, ECG signal, IIR notch filter, Zero phase filtering

Impact of IoT Technologies on Smart City Infrastructure: Current Applications and Future Potential

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ABSTRACT

With the advent of digitization, upcoming technologies like Internet of Things (IOT) are being used by organizations to manage their business, infrastructure as well as assets. In order to make the IT Infrastructure more efficient, upcoming technologies like Internet of things play a very important role as IoT has increased the scale of the storage and the server spaces, improved the internet connectivity thereby leading to a smarter IT infrastructure. Although IoT adoption is taking place rapidly at the enterprise and industrial level; there is a dearth of academic literature in this area. Hence the objective of the paper is to study the adoption of various IoT technologies for smart city infrastructure, understand the impact/benefits of these technologies and propose future potential applications which can be used for smart infrastructure. A case study approach has been adopted for this research wherein various use cases in the IT industry have been analysed with respect to the adoption of IoT technologies for smart city infrastructure and the benefits of the same to the various sectors. The study will be useful for academicians, and practitioners, and Government officials to design and develop solutions for smart city infrastructure that will add to wellbeing of society at large..

Keywords—IoT, IT Infrastructure management, Smart City, Digitization