(1)

Implementation of Optical Distance Measurement Using Correlation-Based and Time Stretching Technique on Digital Signal Controller

Mohamed Atef, Ehab A. Hamed, Abdu-Allah Mahfouz

Abstract:

Through this paper we aim to measure a distance using an optical signal. The distance measurement is based on the time of the flight (TOF) method via correlation technique. A method of stretching the time scale is used to decrease the operating frequency. A proof of concept using Matlab results in a distance resolution less than 17mm. The algorithm is implemented on a standalone cheap digital signal controller and the measured results show high accuracy comparable to the simulated one. The optical transmitters and optical receivers are implemented using off shelf components.

Keywords:

Distance measurement, TOF, DSC Based System, Phase Correlation.

Published In:

The 32st National Radio Science Conference (NRSC2015) , 32nd , pp. 347-354

(2)

Transferring Electromyogram Signal between Limbs

Ehab A. Hamed, Mohamed Atef, Mohamed Abbas, R. R. Gharieb

Abstract:

This paper introduces a sensing and stimulation system to transfer the electromyogram (EMG) signal from one limb to another, aiming to enable self-electro-physical therapy. The presented technique depends on sensing EMG signal from one limb muscle and, simultaneously, stimulating the corresponding muscle in the other limb by this signal. The technique has been implemented on a standalone cheap microcontroller. The sensing and stimulating circuits have been implemented using off-shelf components. The delivery of the stimulating signal has been done noninvasively through surface electrodes.

Keywords:

Electromyogram, EMG, Electrical Stimulation, Rehabilitation, Peripheral nerve injury, Electro-physical therapy

Published In:

Fourth International Japan-Egypt Conference on Electronics, Communications and Computers (JEC-ECC) , NULL , 141-144

(3)

An Ultralow-Power High-Gain Biopotential Amplifier for Electromyogram Signal Recording.

Ehab A. Hamed, Mohamed Atef and Mohamed Abbas

Abstract:

This paper introduces a design for an ultralowpower electromyogram (EMG) signal amplifier with low noise operation. The design consists of two stages, the first stage is highly efficient but supply-sensitive single ended amplifier and the second stage is differential, to improve the supply rejection ratio and common mode rejection ratio. Each stage is configured with cascode MOSFET transistors to increase the gain value. The proposed design is simulated by 130 nm CMOS, and its results are reported. The design achieves 60.62 dB mid-band gain with bandwidth of 1.72kHz. Using a supply voltage of 1.1 V, the amplifier consumes 1.03 A of current. Input referred noise is 3.006 Vrms. The common mode and power supply rejection ratios are above 49.05 dB and 55.72 dB respectively.

Keywords:

Electromyogram, EMG, power supply rejection ratio (PSRR), Common mode rejection ratio (CMRR), ultralow power, current-reuse complimentary input (CRCI).

Published In:

Electronics, Communications and Computers (JAC-ECC), 2017 Japan-Africa Conference , NULL , NULL

(4)

A Low Power Programmable Gain Integrated Front-End for Electromyogram Signal Sensing

Ehab A. Hamed, Mohamed Atef and Mohamed Abbas.

Abstract:

NULL

Keywords:

NULL

Published In:

25th International Conference Mixed Design of Integrated Circuits and Systems , NULL , 103-108