

## ABSTRAK

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**Judul** : Rancang Bangun Aplikasi Pedometer pada Aplikasi Pembaca Gerak Tungkai  
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Untuk merekomendasikan terapi rehabilitasi kelainan gerak pasien stroke yang tepat perlu dilakukan analisis gaya berjalan. Salah satu parameter gaya berjalan adalah jumlah langkah berjalan. Pada penelitian ini dilakukan rancang bangun aplikasi yang berfungsi sebagai pedometer menggunakan MATLAB. Algoritma pedometer menggunakan data akselerometer dan giroskop yang diambil dari subjek penelitian. Sebelum pengambilan data dilakukan pengkalibrasian alat kemudian data akselerometer dan giroskop diubah menjadi *pitch* dan *roll*. Aplikasi pedometer menggunakan *low pass filter* karena karakteristik akselerometer sensitif terhadap vibrasi yang mengakibatkan banyak *noise*. Akibat integral kumulatif, masih terdapat efek *drift* pada data orientasi giroskop, maka diimplementasikan *high pass filter* pada data ini. Untuk menutupi kelemahan masing-masing sensor antara akselerometer dan giroskop maka dilakukan *complementary filter*. Pada hasil akhir *pitch* diterapkan *complementary filter* untuk mendeteksi jumlah langkah dengan metode *peak to peak*. Untuk memvalidasi algoritma pedometer ini digunakan perbandingan terhadap jumlah langkah yang dihitung manual dari subjek yang direkam. Nilai perbandingan jumlah langkah dalam algoritma pedometer terhadap jumlah langkah dari video disebut *Running Count Accuracy* (RCA). Saat analisis didapat nilai RCA rata-rata 0,984375 dan error algoritma pedometer rata-rata 1,5625%. Artinya algoritma dapat digunakan sebagai pedometer.

Kata kunci: algoritma pedometer, *complementary filter*, *Running Count Accuracy*

## ABSTRACT

*In order to recommend appropriate rehabilitation therapy for stroke patients, a gait analysis is necessary. One of the gait parameters is the number of walking steps. In this research, an application design that functions as a pedometer is carried out using MATLAB. The pedometer algorithm uses accelerometer and gyroscope data taken from research subjects. Prior to data collection, the calibration of the instrument was carried out, then the accelerometer and gyroscope data were converted into pitch and roll. The design uses a low pass filter because the characteristics of the accelerometer are sensitive to vibration which causes a lot of noise. As a result of the cumulative integral, there is still a drift effect on the gyroscope orientation data, hence high pass filter implemented on this data. To cover the weaknesses of each sensor between the accelerometer and gyroscope, a complementary filter is carried out. In the final results of the pitch, a complementary filter is applied to detect the number of steps with peak to peak method. To validate the pedometer algorithm, a comparison is made of the number of steps counted manually from the recorded subjects. The comparison value of the number of steps in the pedometer algorithm to the number of steps from the video is called Running Count Accuracy (RCA). During the analysis, the average RCA value was 0.984375 and the average pedometer algorithm error was 1.5625%. This means that the algorithm can be used as a pedometer.*

**Keywords:** *pedometer algorithm, complementary filter, Running Count Accuracy*