полосой пропускания (десятки килогерц);

- наличие делителя, для работы с напряжениями в сотни вольт;

- объем памяти;

- возможность управления питанием;

- одномодульность (все что нужно, в одном корпусе).

Основной задачей является разработка даталоггера, позволяющего записывать переходные процессы в электрической системе автомобиля в процессе его эксплуатации на протяжении не менее шести месяцев.

WAVELET-BASED MOTION ARTEFACTS REMOVAL FOR PHOTOPLETHYSMOGRAPHY (PPG)

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PPG is a device to detect blood volume changes by using a pair of LED and photodiode. The main problem is the removal of motion artefacts. From the idea which we got from researches of non-stationary time series, we decided to use wavelet as the tool to analyze and remove motion artefacts.

Wavelet analysis uses a series of basis functions to decompose signals. We use dyadic wavelet transform and quadratic spline function as the wavelet. [3]

If a function $\Psi(t)$ has Fourier transforms $\Psi(\omega)$, and $\Psi(\omega)$ satisfies $\frac{|\widehat{\Psi}(\omega)|}{|\omega|} d\omega < \infty$, then we call it as a wavelet function. For j ∋ Z, we consider $\Psi_{2^j}(t)$ as the dyadic scaling transform of $\Psi(t)$ by factor 2^j: $\Psi_{2^j}(t) = \frac{1}{2^j}\Psi(t)$, then the wavelet transform of f(t) at the scale 2^j is defined as $W_{2^j}f(t) = f * \Psi_{2^j}(t)$. We call $W_{2^j}(t)$ as the dyadic wavelet transform of f(t).

In practical application, we impose j>1. We can define a function $\varphi(t)$, and it has Fourier transform $|\widehat{\varphi}(\omega)|^2 = \sum_{j=1}^{\infty} \widehat{\Psi}(2^j\omega)\widehat{X}(2^j\omega)$. We can safely say that $\varphi(t)$ as a low-pass filter. It means that we can design a low-pass filter which can perform as a wavelet and get low-pass filtering component $S_{2^j}f(t)$. Meanwhile, the high-pass filtering component (the details) still exists and it can be recovered from wavelet transform $W_{2^j}f(t)$. The fast decomposition algorithm:

$$\begin{cases} W_{2^{j+1}}f(t) = S_{2^j}f(t) \cdot G \\ S_{2^{j+1}}f(t) = S_{2^j}f(t) \cdot H \end{cases}$$

Where H and G are the known parameters of filter bank. The algorithm can be used j times, and $S_{2^{j+1}}f(t)$ is the result, which we want to get.

We use a clear PPG signal from PhysioBank ATM, and add motion artefacts on it, the use quadratic spline function to decompose the signal for 10 times.
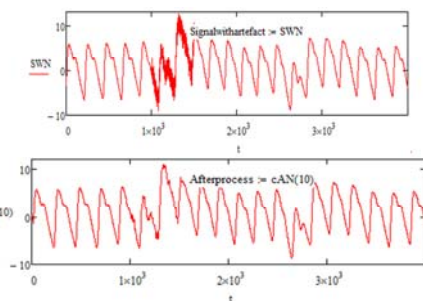
We can see that artefacts are successfully removed and the waveform still maintains as the original signal.

SYSTEM FOR CONTROL OF FABRIC SURFACE
WITH COATING IN ROLL MACHINE

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A coated fabric combines the benefits of the base fabric with those of the polymer with which it is coated. The resulting coated fabric will have many properties which cannot be offered by either component individually, and careful consideration is necessary to select both base fabric and coating polymer. The base fabric provides the mechanical strength of the composite material and supports the layer of coating applied to it. For quality coated fabrics, quality base fabrics are essential. This point is made because newcomers to the industry sometimes believe that the coating can cover fabric defects, and so second quality fabrics may be sent for coating. In fact, the defect is frequently made more prominent and the cost of rejected coated fabric, with the added value of coating, will be significantly higher than that of the base fabric alone.

Control sensors
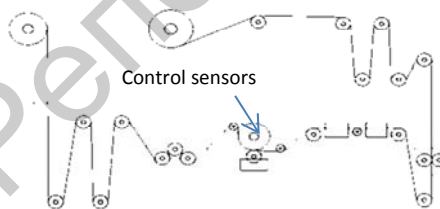
Fir.1

It can be appreciated that coating penetration between individual threads will tend to reduce tear strength. Feed material is through commercials, but after applying we need to know the quality of operations Along canvases have are three sensors, that can control the quality of the coating (Fig.1).