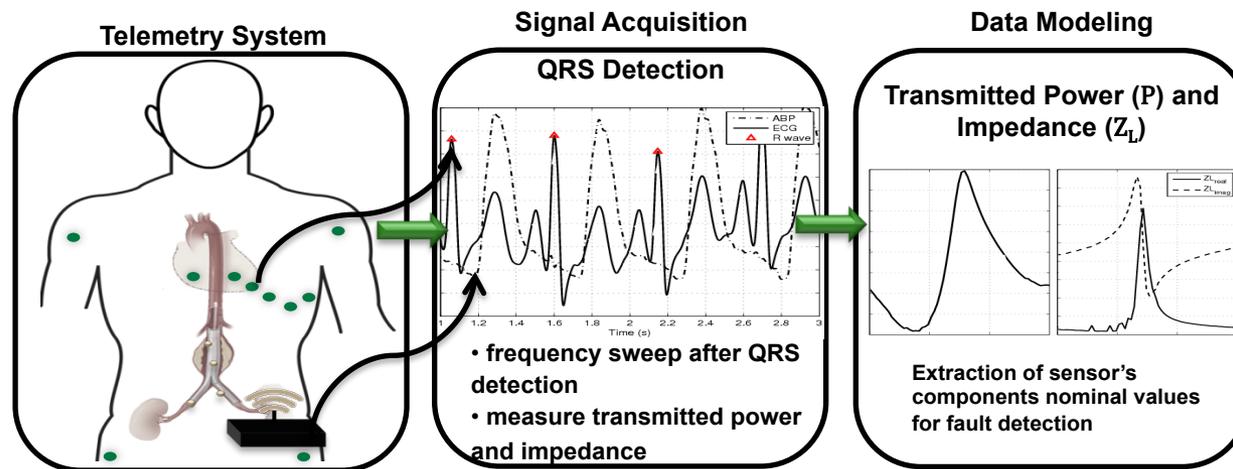


Exploring Sensors' Fusion on the Design of Dependable Medical Electronic Systems.

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- The applicability of multi-modal data fusion techniques allows improving the performance of systems in different application domains. After taking advantage of the complementarity of information gathered from different sources, namely in terms of detection accuracy and classification of phenomena which allow improving reliability, higher reliability, higher resolution, and widening of the observed domain. The use of complementary and competitive information can actually improve the correct identification of error sources, in this case the monitoring system and not the patient.



Description

- The new monitoring methodology aims to obtain a simple and non-invasive technique, which allows continuous monitoring and efficient detection of abnormalities such as hyperplasia and thrombotic occlusion, fracture, dislocation from the desired position, and blood leaks after a coronary stent-graft placement. The new method uses RF technology to detect the resonance frequency of an LC loop in which the capacity is determined by the pressure sensor in the stent's bag. The pressure exerted on the wall of the aneurysm sac is one of the most important indicators for monitoring post surgical patients who underwent EVAR, but currently the standard methods to obtain these values resort to invasive practices.

The joint analysis of other physiological signals allows to extract additional relevant information about the patient's condition. The analysis of ECG and ABP data provides further information on the variability of heart rate and cardiac output. The heart rate variability is associated with conditions such as heart failure, and cardiac output is one of the most important hemodynamic signals that are measured in patients with compromised cardiovascular function. If the cardiac cycle can be measured more frequently or even continuously, doctors can detect abnormalities in the cardiovascular system and make eventually early needed interventions.