09BM045 Geometric Feature Extraction for Precise Measurements in Intramedullary Nail images

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In orthopedic surgery, one of the most common methods of reducing fractures of long bones such as the femur and the tibia is Closed Intramedullary Nailing (CIN). The process of finding the exact position and direction of entry for the insertion of the screws often requires a large amount of anterior/posterior and lateral X-ray views, which results in the patient receiving large doses of radiation and a prolonged procedure duration, with a correspondingly increased risk of infection. Therefore, a system which provides an accurate depiction of the position and orientation of the locking holes to the surgeon, and in particular using only a few (or, ideally, one) X-ray images, would greatly improve this process resulting in fewer risks for the patient, less time spent in surgery and reduced cost.

In this paper, we present a method for accurate extraction of the nail and hole projection geometric characteristics that are insensitive to any such deformation, as it makes no assumptions concerning the shape of the nail projection other than the assumption that the projection is polygonal. The geometric characteristics extracted will be later used in the construction of a 3D model of the nail and bone in order to provide the surgeon with an accurate depiction of the position of the nail and the optimal drilling angle.

09BM080 Wireless Intelligent Systems for Biosignals Monitoring Using Low Cost Devices

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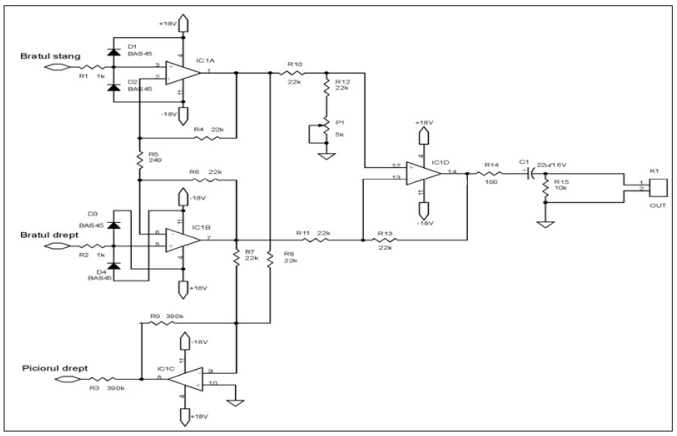
In this paper we propose a system able to monitor biosignals, to record information on SD card or to send relevant data remotely. This application demonstrates how to develop new wireless intelligent system, to be future used in processing, analyzing and extracting necessary features from biosignals, easily and conveniently. Artificial intelligence improves the biosignals monitoring efficiency and help critical caretakers to speed up a prior diagnose. With LabVIEW and related toolkits, such as the Advanced Signal Processing Toolkit (ASPT) and the Digital Filter Design Toolkit (DFDT), we can conveniently build signal processing applications for both stages(preprocessing and filtering), including baseline wandering removing, noise cancellation, QRS complexes detection, fetal heart rate extraction and etc. We also discuss typical ECG signal processing methods based on LabVIEW and we present the developed improvements for preprocessing and processing ECG signals for QRS complexes, using different function from LabVIEW.



Circuit diagram of EKG-V2 amplification module.