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## A contactless capacitive biosensor for muscle activity measurement

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As elderly population grows globally, the percentage of people diagnosed with musculoskeletal disorder (MSD) increase proportionally. Electromyography (EMG) is an important biosignal that contributes to MSD's clinical diagnose and recovery process. Conventional conductive electrode has many disadvantages in the continuous EMG measurement application. This research has design a new surface EMG biosensor based on the parallel-plate capacitive coupling principle. The biosensor is developed by using a double-sided PCB with having one side of the PCB use to construct high input impedance circuitry while the other side of the copper (CU) plate functions as biosignal sensing metal plate. The metal plate is insulated using kapton tape for contactless application. The result implicates that capacitive biosensor is capable to constantly capture EMG signal without having galvanic contact to human skin surface. However, there is noticeable noise couple into the measured signal. Post signal processing is needed in order to present a clean and significant EMG signal. A complete design of single ended, non-contact, high input impedance, front end EMG biosensor is presented in this paper.

### Biography

Md Mamun Bin Ibne received his BSc and MSc degree in Applied Physics and Electronics, both from University of Rajshahi, Bangladesh, in 1985 and 1986, respectively. He received his Doctorate Engineering degree in 2007 from Ibaraki University, Japan. He is currently a Professor in the Department of Electrical, Electronic and Systems Engineering, UniversitiKebangsaan Malaysia, Malaysia involving in teaching, research and industrial consultation. He is a regular associate of the Abdus Salam International Centre for Theoretical Physics since 2008. He is also a Senior Member of IEEE. He has vast research experiences in Japan, Italy and Malaysia. He has published extensively in the area of IC Design and Biomedical application IC. He is author and co-author of more than 200 research articles in design automation and IC design for biomedical applications. He is also the recipients of more than 50 research grants (national and international).

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