STATEMENT OF OBJECTIVES

My name is Abdulaziz Al Dayel, and I'm currently a Lecturer in Physical Education at King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia. I hold a Bachelor's degree in Physical Education from King Saud University (KSU), Saudi Arabia, which I received in 1999. In 2004, I completed my master's degree in Exercise Science from the University of Kansas in the United States, for which I had been awarded a full scholarship from KFUPM.

Now, I am awarded a full scholarship, from KFUPM also, to obtain a doctoral degree. I am looking to continue my studies further, and am looking to undertake a doctoral programme that would allow me to build on my studies to date. I am looking for a Ph.D. programme offered by any educational or medical institution would offer an excellent research opportunity for me to undertake further specialized study, as well as allowing me to demonstrate my independence as a scholar with a major research contribution to the discipline. I would find a programme that consists of both coursework and research, by achieving it would not only enhance my own job performance back at KFUPM upon the completion of my studies, but I would also be able to enhance and share my knowledge with my colleagues and the department generally, who may not have had the opportunity to utilize such advanced research methods.

I would propose to undertake my studies in the Electromyography (EMG) system, (surface EMG), and the factors affecting the pattern of the signal, which have their influence on extracting quantitative information from the signal. EMG signals are dependent on a number of factors, such as the change in muscle temperature, the variation in muscle length, velocity of contraction, electrode placement, the difference in the muscle fiber compositions, and other factors. I would investigate, at least, four main points that have an effect on EMG signals: the signal to noise ratio of the detected signal, the bandwidth of the signal, the muscle sample size, and susceptibility to cross-talk. I believe that controlling these points could give us a better opportunity to isolate any electrical signals that are not part of the essential EMG signal. In Addition, determine the distortion of the signal of any frequency component in the EMG signal, which is supposed to be not changed. This study may contribute to an increasing or a decreasing in the validity of surface EMG in the kinesiological domains.

Another field, which I would propose my studies, is how the different forms of fatigue can have an effect on the EMG signal in either time (integrated EMG) or frequency (mean power frequency of EMG). Numerous studies have been conducted to determine the kind of relationship between muscle morphology and EMG strictures during fatigue. As you know, fiber fatigue is reflected in EMG as an increase in integrated EMG (iEMG) and/or a decrease in the mean power frequency (MPF) of EMG, which are noted in different types of exercise. So, I would investigate the validity of EMG-based fatigue estimation: comparison with rating of perceived exertion (PRF) and the salivary cortisol response. The previous studies in this topic are insufficient and we need further research to validate surface EMG in assessing different forms of fatigue. I believe this study could also contribute to the validity of surface EMG.

However, my research interest is quite broad and flexible in the circle of EMG. I would trust that my research goals could be of interest to one of those whose research interests in muscle contraction and human motion through combined mechanical and electrical detection techniques.

Yours sincerely,

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