

## **[Keynote Talk]: sEMG Interface Design for Locomotion Identification**

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**Abstract :** Surface electromyographic (sEMG) signal has the potential to identify the human activities and intention. This potential is further exploited to control the artificial limbs using the sEMG signal from residual limbs of amputees. The paper deals with the development of multichannel cost efficient sEMG signal interface for research application, along with evaluation of proposed class dependent statistical approach of the feature selection method. The sEMG signal acquisition interface was developed using ADS1298 of Texas Instruments, which is a front-end interface integrated circuit for ECG application. Further, the sEMG signal is recorded from two lower limb muscles for three locomotions namely: Plane Walk (PW), Stair Ascending (SA), Stair Descending (SD). A class dependent statistical approach is proposed for feature selection and also its performance is compared with 12 preexisting feature vectors. To make the study more extensive, performance of five different types of classifiers are compared. The outcome of the current piece of work proves the suitability of the proposed feature selection algorithm for locomotion recognition, as compared to other existing feature vectors. The SVM Classifier is found as the outperformed classifier among compared classifiers with an average recognition accuracy of 97.40%. Feature vector selection emerges as the most dominant factor affecting the classification performance as it holds 51.51% of the total variance in classification accuracy. The results demonstrate the potentials of the developed sEMG signal acquisition interface along with the proposed feature selection algorithm.

**Keywords :** classifiers, feature selection, locomotion, sEMG

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