**Abstract**

When we deal with body sensor networks (BSN), we primarily find that it is not ideal to use sensors by directly attaching them to the body. Instead, it will be easier to integrate them along with the clothes, increasing the usability of these sensors. But, this raises a fundamental problem that these sensors add their own artifacts for movements. This could lead to the model evaluating wrong patterns or loosing valuable information. By creating a model which could learn the measurement differences of sensors attached to the body with those sensors integrated in the clothing, the problem of additional motion artifacts can be overcome. The model can then be generalised to learn tightly coupled sensor measurements with the loosely coupled ones.

**Introduction**

A body sensor network(BSN) consists of sensors attached to the body. There are essentially two types of body sensor networks - constrained body sensor networks(cBSNs) and free-mode body sensor networks(fmBSNs) [1]. cBSNs have been known to many useful applications in the present time but their deployment problems restrict their uses in the real world applications. The usability issues of cBSNs have led to investigations of fmBSNs which allow the sensors to be attached to the clothing and thus improving the usability criteria.

Although fmBSNs have improved the utility of BSNs, they come with a problem that they posses high motion artifacts, which would be observed less in cBSNs. The additional artifacts are due to the inherent movement of the clothing material to which the sensors are attached. The problem statement thus deduces