## Appendix (ix) Technical Details

**Technical Details**

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| Ethics reference number: **ERGO/**FPSE**/17661** | Version: 1 | Date: 2015-10-08 |
| Study Title: Ultra-low-power exercise monitoring applications for sub-threshold micro-controllers | | |
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This study involves the collection of two sets of movement data:

* Exercisers recommended to help prevent the risks of Deep Vein Thrombosis whilst travelling via aircraft:
  + While seated, stretching out the legs and slowly rotating the feet.
  + Placing the feet on the ground and raise their heels, followed by raising the toes and rolling back the heels to the ground.
  + Holding one's left shoulder with their right hand, and right elbow with the left hand, holding this position loosely for a few seconds and repeating for the other shoulder.
  + Rolling the shoulders forward 5 times, then backwards 5 times.
  + Raising a knee to the chest and holding loosely for a few seconds.
  + Slowly moving hands from the stomach down to ankles and holding this position for a few seconds, before slowly straitening up.
  + Rolling the head from shoulder to shoulder.
* Other movement which may be common whilst travelling in a commercial aircraft:
  + Sitting, getting up and shifting in one's seat.
  + Walking in a straight line.

The study involves two data collection phases, both of which require the participants to complete the above exercisers. The first session will be used to collect anonymous movement data which will then be secured and used as training data for a Machine Learning algorithm to detect when a human wearer performs the correct exercisers, and is able to avoid false positives, such as when the wearer walks along the aisle or moves in their seat.

When the algorithm is complete, and has been implemented and deployed onto our chosen device, the second data collection phase will be used to test and evaluate the effectiveness of the device at detecting all exercise movement.

Our studies will require the use of 20 participants per session.