Comparison of vestibular input statistics during natural activities and while piloting an aircraft

Running title: Vestibular inputs in natural activities and while piloting

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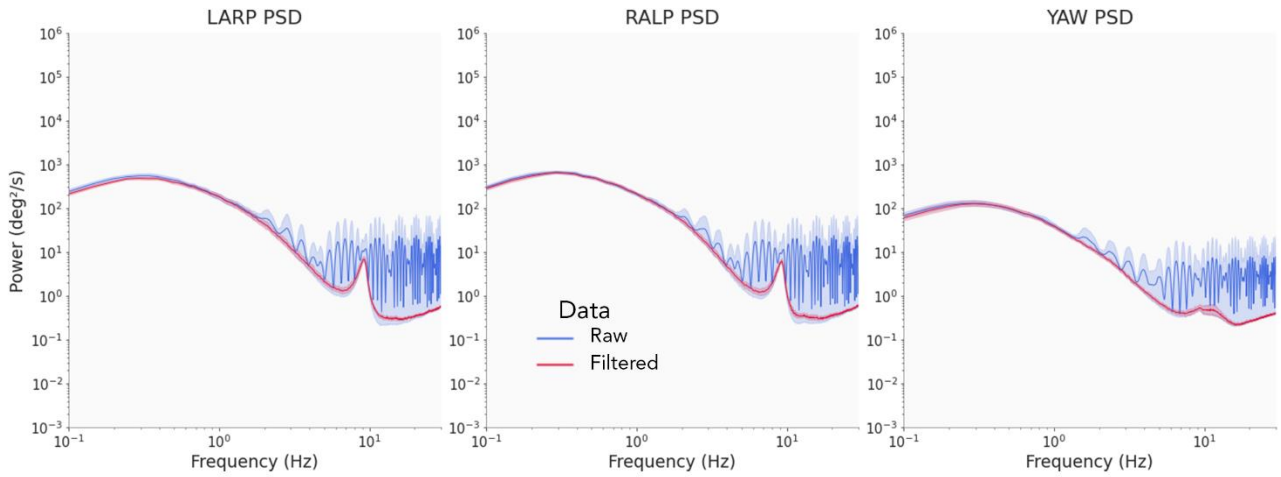
Sample quality



Supplementary Figure 2: Population-averaged power spectra of the head-velocity in the LARP, RALP and YAW planes with corresponding 95% confidence interval (shaded areas). Blue: raw data, red: filtered data, where samples associated with a quality value below 0.5 were discarded.

Each data sample measured with the HObIT was associated with a quality value. This value indicates how *confident* the sensor is in the accuracy of the measurement. Although many factors can affect the quality of a sample, we believe that the physiological characteristics of the individual whose head is being tracked are the most predominant, notably their height and their posture. The subjective camera that tracks the fiducial markers has an optimal tracking range, hence differences in height and posture may lead to better or worst recordings in terms of quality. As a matter of fact, the overall quality of the recordings varied greatly among pilots in the manual navigation task. We found that lower quality samples were artifacts that were detrimental to the computation of the power spectra. To ensure adequate results, we chose to set an experimental threshold on the minimum quality required for a sampled to be considered correct. Samples that did not pass this criteria were discarded. The results presented in this paper implicitly included such *filtering* or *denoising* step, with a threshold set to 0.5. Supplementary Figure 1 compares the power spectra of the manual navigation task computed with or without filtering. We observe that not removing the low-quality samples limits the interpretability of the results: while both spectra have the same shape in the low frequency range ($0 - 3$ Hz), many artifacts pollute the higher frequencies of the raw data.