**FUTURE WORK & DISCUSSION**

We discuss issues and questions to inform future work.

Our system can only recognize 3 neck gestures, because of the hardware limitation of unstable electrode pads we used. When user performs any neck gestures, some pads that linked to electrode of EMG sensors would twine, and bring noise signal as side effects. Our future work will target on either replacing with harder pads, or strength the sensors attachment in order to receive less noised signals.

Our system requires users to place EMG sensors accurately surrounding user’s neck, thus it is necessary to embedded sensors into necklace or collar for easy wear. Our future work will focus on convenient and wearable NECX device using various neck gestures.

Our primary goal is making our product publicly, not only concern for the disabled who have spinal cord injury, but also the public. It is possible to embed our system into a travel pillow for travel in airplane. Within this case, the future work will aim at providing heart rate monitoring, muscle stress detection and thirsty stage detection during flight. By measuring ECG data and detailed abstraction of neck muscle caused by maintaining same position for related long period and swallowing, our system will develop an interface that uses simulation to warning users for heart rate, to exercise, or to drink more water when necessary.

**CONCLUSION**

In this work we used EMG data to detect 3 different neck gestures in real-time. The system is composed of EMG sensors are worn by the user. Gesture data is sent wirelessly via Bluetooth to a nearby PC for signal processing and gesture recognition. Then correlated commands are sent based on different gesture performed by users. Our proposed algorithm trains and classifies based on frequency and magnitude of input data set, allowing us to maximizes the classification accuracy for various inputs of gesture performance. Our system can deliver feasibility and robustness of the neck gesture recognition with the potential to help the disabled who have spinal cord injury.