Page one:

Hello, everyone my name is Kuanghua Qiao. I’m an electrical engineering student from York University. Today I would like to introduce you to one of the projects I have been working on: A Non-Invasive Wireless Respiratory Monitoring System for Animals. This project is done under the supervision of professor E. Ghafar-Zadeh, in collaboration with A. Nickerson, S. MacDonald from Dept. of Psychology

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The main objective of the project is to develop a biomedical device that can noninvasively monitor a dog’s breath rate using a conductive fabric. Nowadays more and more people are keeping dogs as their loyal companions. The number of pet dogs has increased from 68 million in 2000 to 89.7 million by 2017. As such the need for simple reliable and cheap breath rate sensor for dogs will also be increasingly demanded. Our device can really simplify the dog breath rate sensing technology making them more affordable and reliable for a dog or even other pet owners.

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The device is capable of measuring both the breath rate and the body temperature of the dog. It also takes advantage of the flexibility of wireless technology.

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The hardware contains the rubber cord stretch sensor. (open the link and introduce the product) It senses the dog’s breathing by tracking the motion in its chest.

Then we have a temperature sensor (open the link and introduce the product) digital, one wire interface.

The microcontroller board is Adafruit HUZZAH 32. (open the link and introduce the product) It’s got both Wi-Fi and blue tooth resulting in a better design flexibility

A form-fitting battery. (open the link and introduce the product)

And a dog harness to mount the device. (open the link and introduce the product)

Page five and six:

The code on microcontroller was developed in Arduino IDE. The code will be constantly waiting for a request to read stretch sensor data or temperature sensor data.

A Graphical user interface was developed in MATLAB. It is responsible for requesting data from the microcontroller and compile them into a table.

Page demonstration:

First, I will do a simple functionality demo….

Here’s some footage of actual test on a dog provided by Amanda and Susanne.

End page:

To conclude, the device is low cost simple and easy to use. However, there are still problems regarding disturbances and sensitivity. The stretching disturbance caused by the animal’s movement can be hard to eliminate. Never the less, this project opens a lot of promising new possibilities for animal bio-medical applications such as animal medical diagnostics and treatment, animal psychology and physiology researches and so on.