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**Conference or Workshop Item**

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**Creator:** Al-Rubaye, Z.

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# Lameness Detection in Sheep Through Behavioural Sensor Data Analysis

**Zainab Al-Rubaye, APG Student**  
zainab.al-rubaye@Northampton.ac.uk

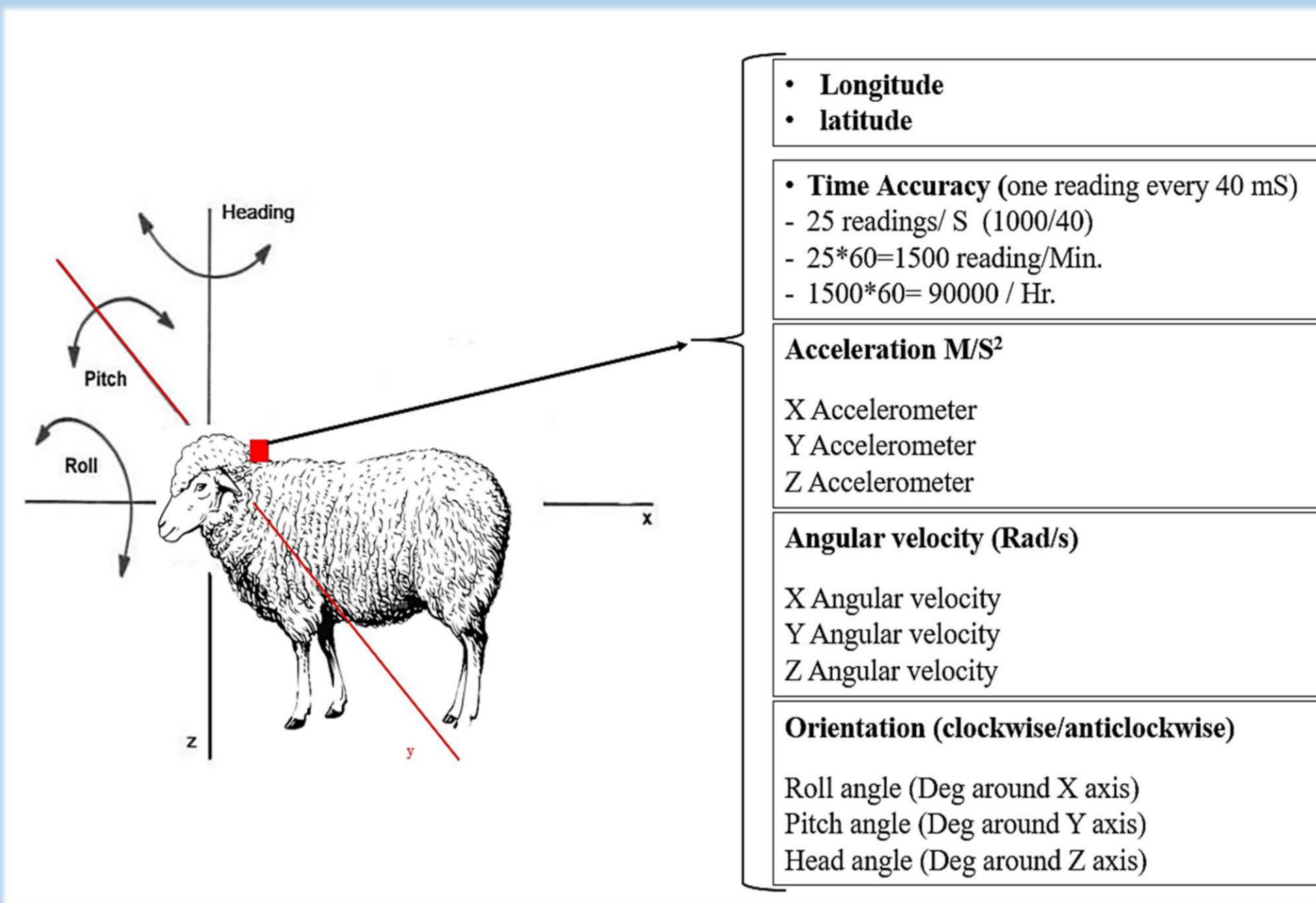


## Problem Statement:

Lameness is an abnormal gait or stance that is usually caused by footrot. It has a negative impact on sheep industry and farm productivity in the UK. Therefore, preclinical detection of lameness at the farm will increase the level of protection.

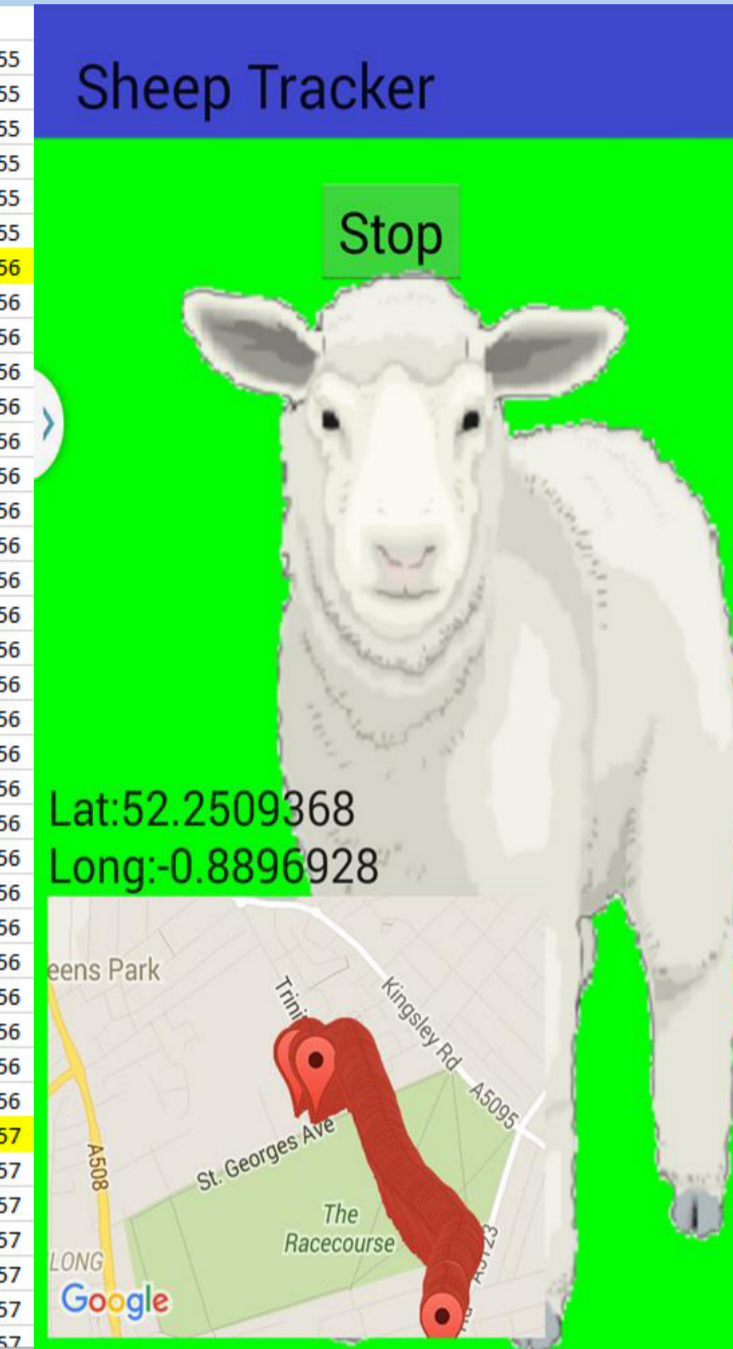


## Data collection:

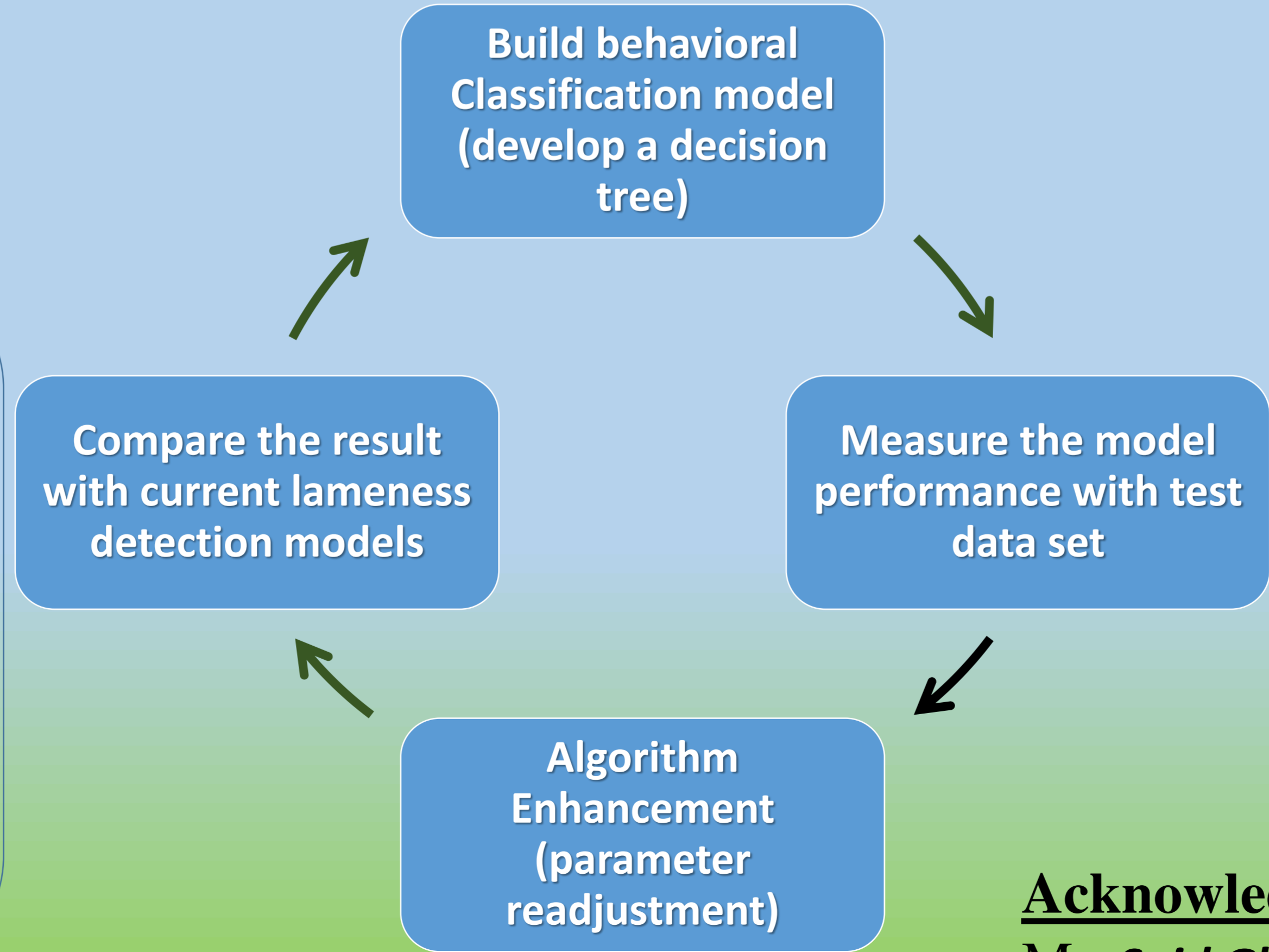


## Prototype type sensor data:

Acc_X	Acc_Y	Acc_Z	Gyr_X	Gyr_Y	Gyr_Z	Orien_Pth	Orien_Rol	Orien_Yaw	Latitude	Longitude	Date	Time
1	-1.41206	-1.09866	-3.14822	-0.41447	-0.02657	0.297491	-7.25473	6.600892	310.3531	52.24362	01/03/2016	09:21:55
2	0.425038	0.44483	-3.10513	-0.23366	-0.01588	0.131641	-8.80875	7.453902	310.5556	52.24362	01/03/2016	09:21:55
3	-0.29535	0.643682	-2.94609	0.275195	0.24679	0.083689	-10.8591	7.567343	311.717	52.24362	01/03/2016	09:21:55
4	0.148623	0.731981	-1.15018	0.005803	0.045815	0.275806	-11.9706	8.203566	312.3011	52.24362	01/03/2016	09:21:55
5	0.683669	1.021282	0.649746	-0.12401	-0.0504	0.258091	-12.9446	9.382023	312.0994	52.24362	01/03/2016	09:21:55
6	1.238449	0.931352	2.085443	0.165544	-0.14966	0.132558	-13.7964	10.49386	311.6836	52.24362	01/03/2016	09:21:55
7	1.110323	0.970708	1.600198	0.64599	0.004581	-0.10507	-14.7519	11.1658	311.3469	52.24357	01/03/2016	09:21:56
8	0.234394	1.125133	1.645186	0.570548	0.423024	-0.21228	-15.4546	10.9047	311.4932	52.24357	01/03/2016	09:21:56
9	0.819781	-0.08046	2.217341	-0.35613	0.335365	-0.17287	-13.2139	11.11818	310.3222	52.24357	01/03/2016	09:21:56
10	0.629702	-1.61074	7.407036	-0.7813	0.73762	-0.5006	-9.80794	9.841913	308.8298	52.24357	01/03/2016	09:21:56
11	0.482906	-1.84017	1.319989	0.120035	-0.20433	-0.79168	-8.72858	11.1914	307.3686	52.24357	01/03/2016	09:21:56
12	0.792547	-1.49338	-4.42905	0.446848	-0.61728	-0.63072	-10.0561	12.37683	307.2485	52.24357	01/03/2016	09:21:56
13	-0.42969	-0.5442	-3.57806	-0.27794	-0.06139	-0.05284	-7.83735	12.72567	305.8074	52.24357	01/03/2016	09:21:56
14	-0.61755	-0.346	-1.19205	-0.5846	0.200975	0.00336	-7.58461	12.06477	306.386	52.24357	01/03/2016	09:21:56
15	-0.32576	0.419152	-0.64115	-0.82528	-0.28466	-0.49786	-8.13541	12.3397	307.2076	52.24357	01/03/2016	09:21:56
16	0.032981	0.618344	-1.29169	-0.39981	-0.21869	-0.80176	-9.73213	12.46448	308.2071	52.24357	01/03/2016	09:21:56
17	-0.53319	0.748493	-2.04812	0.132863	-0.08247	-0.82681	-11.5223	12.1119	309.8902	52.24357	01/03/2016	09:21:56
18	-0.52735	0.795586	-1.512	0.216246	0.051007	-0.65607	-13.0956	12.06047	311.4238	52.24357	01/03/2016	09:21:56
19	0.135648	0.675806	-1.13376	0.165239	-0.16096	-0.54825	-14.2796	12.74051	312.2467	52.24357	01/03/2016	09:21:56
20	0.241151	0.652615	0.820967	0.250149	-0.07727	-0.51343	-14.891	12.48817	313.0367	52.24357	01/03/2016	09:21:56
21	0.122735	0.58059	1.770289	0.561996	0.010079	-0.51038	-15.5772	12.18546	313.4051	52.24357	01/03/2016	09:21:56
22	-0.18289	1.584377	0.475251	0.554055	0.091019	-0.55833	-17.3039	11.77783	314.1957	52.24357	01/03/2016	09:21:56
23	0.45634	1.493937	2.788359	-0.27397	0.42333	-0.4383	-16.511	10.80659	314.486	52.24357	01/03/2016	09:21:56
24	0.818337	-1.53572	8.378736	-0.88942	0.65668	-0.53939	-12.1976	10.00591	313.0419	52.24357	01/03/2016	09:21:56
25	0.228448	-1.75582	4.277013	0.219911	-0.3485	-1.19058	-10.7859	9.921156	312.3396	52.24357	01/03/2016	09:21:56
26	-2.29381	-1.17149	-3.36496	0.930653	-0.52718	-1.48685	-12.0605	9.235152	313.7735	52.24357	01/03/2016	09:21:56
27	-3.11234	-1.39239	-4.57257	-0.12706	-0.04368	-1.13346	-10.0302	7.29774	313.6914	52.24357	01/03/2016	09:21:56
28	0.97684	0.175195	-2.12487	-0.8601	0.338419	-1.44225	-10.818	8.005806	314.1053	52.24357	01/03/2016	09:21:56
29	-1.07939	-0.85751	-2.81847	-0.76725	-0.09041	-1.76387	-10.6273	6.378438	315.6806	52.24357	01/03/2016	09:21:56
30	-1.47679	-1.06671	-0.23947	-0.79321	0.798706	-1.47646	-9.23575	5.540185	317.0104	52.24357	01/03/2016	09:21:56
31	-2.52674	-0.58372	-0.30242	-0.13103	0.378126	-1.2651	-9.16958	0.266333	319.769	52.24357	01/03/2016	09:21:56
32	-1.48721	0.673674	-1.7895	0.707077	-0.2306	-1.2144	-10.9427	-1.01561	322.6701	52.24358	01/03/2016	09:21:57
33	0.735851	0.604581	-0.40294	0.375682	-0.47586	-1.01862	-11.714	0.595341	322.564	52.24358	01/03/2016	09:21:57
34	0.814843	0.816752	2.133312	-0.2813	-0.76938	-1.22509	-12.0569	1.387819	323.1566	52.24358	01/03/2016	09:21:57
35	-0.45393	1.300783	3.040077	0.594372	-0.13347	-1.21745	-13.5265	0.218139	324.6824	52.24358	01/03/2016	09:21:57
36	-1.50465	1.224987	1.485704	1.717142	0.419054	-1.07879	-14.9175	-2.17572	327.773	52.24358	01/03/2016	09:21:57
37	-1.85876	2.322721	1.798288	0.051618	-0.08583	-1.00029	-15.2147	-3.43787	329.9373	52.24358	01/03/2016	09:21:57
38	0.578824	-0.45783	0.96552	-0.76664	-0.75545	-0.89726	-13.099	-1.54658	328.7387	52.24358	01/03/2016	09:21:57



## Methodology



## Aims:

Develop an automated model to early detect lameness in sheep by analysing the data that will be retrieved from a mounted sensor on the sheep neck collar. This will help the shepherd to identify the lame sheep for better prevent from worse situations of trimming or even culling the sheep.

## Ethical Evidence:

An ethical approval has been obtained from Moulton College/ Lodge farm; the place where the research will be conducted.

## Acknowledgement:

Mr. *Said Ghendir* has developed the software of the sensor.