Seeing While Walking - Weekly Report 2

**Analysis of Last Year’s Results**

This Weekly Report focuses on analysing and determining weaknesses in the results of the previous year’s project group. In the report “Seeing While Walking – A Control System Approach to Stabilize an AIBO Video Camera”, three different approaches for stabilizing the camera of the AIBO are described.

**Physical Modelling**

The previous group only made a “two-legged” physical model of the dog. Furthermore, they didn’t take into account that one leg might not touch the ground or that other constraints may exist. These two facts alone, made it impossible to use the obtained result of the physical model. In other words, they simplified too much, too early. It has to be said that a physical model is desirable, but in order to construct a good model, the approximations has to be done in the right stages of the design. This was not done by our predecessors.

**The Head Leveler**

In this approach the group tried to use an existing program for stabilizing the head. The tests were done by letting the camera film a black dot on a white wall in front of the dog while it walked towards it. Unfortunately, the graphs in the report were quite un-clear and the results obtained (removing the low frequent oscillations in the horizontal direction) is – if not questionable – at least hard to observe in the plots. It doesn’t seem like they analysed the program that they used, which could have been done in order to further improve the results. An important and good result, however, is that a periodicity of the oscillations were found. This can be important for the work that lay ahead of us.

**System Identification**

System identification is probably the most interesting approach to the problem. A big mistake that was done was that they didn’t know how the values from the angles of the joints were measured. In the “Go AIBO”-report, it’s stated that the values from the readings are delayed 16-20 ms. This is very important information if a regulator is to be designed and it also suggests that a proper and thorough investigation needs to be performed before any real attempts at designing a regulator can be done. Another thing to investigate is if the readings from the acceleration sensors are accurate enough to use as input.