Embedded Control Systems

Group 5 Weekly Report – 080521

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From the head positions data we gathered last week, we made curve fitting by interpolating sampled local extreme points. Then we got data with 30 ms intervals fitting on head misplacement data. This data is then used in implementation of compensation moves in the code by inverting the data with respect to the point where there is no misplacement. We are currently working with compensation for the pan movement of the neck. Our major challenge is synchronization, which we are very close to solve. The only part now left is to integrate our compensating head movement with the synchronized intervals. Once we are done with our pan compensation, we will work our way through quickly for the Tilt, using the same procedure.

Now, for the synchronization part, we need these two data to be relatively static to each other (i.e. when the angle of the leg is A, we will start applying the counter neck movements periodically, if does not seem to be synchronized in the test runs, then try A +a, where a is a small increment and go on trying). For that matter, we somewhat define a pivot point on roll angle of one of the legs. This pivot is the maximum value of the angle. However, due to difference readings in the sensor, it is hard to define a precise maximum value, so instead we employ a more generic solution; we find the point where the slope of the curve of the angle changes from positive to negative (local maximum). Implementing the code to find this pivot point took more than we expected again due to the differences in sensor readings (i.e. even if the dog is not moving, the values change a little bit), so we tuned it by introducing some delta difference that is safe to ignore. The next step is just to shift our counter neck movements relative to this pivot point to find the synchronization.