Virtual Reality Summative

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Question Remarks

1. `get_sanitized_imu_data()` returns the corrected data readings from the csv file, returning a 2D array of data rows. `reading_to_qtrn(reading,prev_sample_time)` computes a quaternion (a, b, c, d) from a given input gyroscope reading and previous sample time, such that the delta rotation is calculated correctly. `euler_to_qtrn(axis, angle)` takes an axis of rotation (x, y, z) and angle θ in radians, returning a quaternion (a, b, c, d). `qtrn_to_euler(qtrn)` takes a quaternion (a, b, c, d) and returns a tuple of the rotation axis and angle rotation this quaternion represents $((x, y, z), \theta)$. `qtrn_conj(qtrn)` takes a quaternion (a, b, c, d) and returns its conjugate, $(a, -b, -c, -d)$. `qtrn_mult(qtrn_1, qtrn_2)` computes the product of 2 quaternions.

3. Try a few different alpha values (e.g., 0.01, 0.1, ...), investigate and comment on their effect on drift compensation in your report (7 marks)

4. Try a few different alpha values (e.g., 0.01, 0.1, ...), investigate and comment on their effect on drift compensation in your report (5 marks).

Visualisations

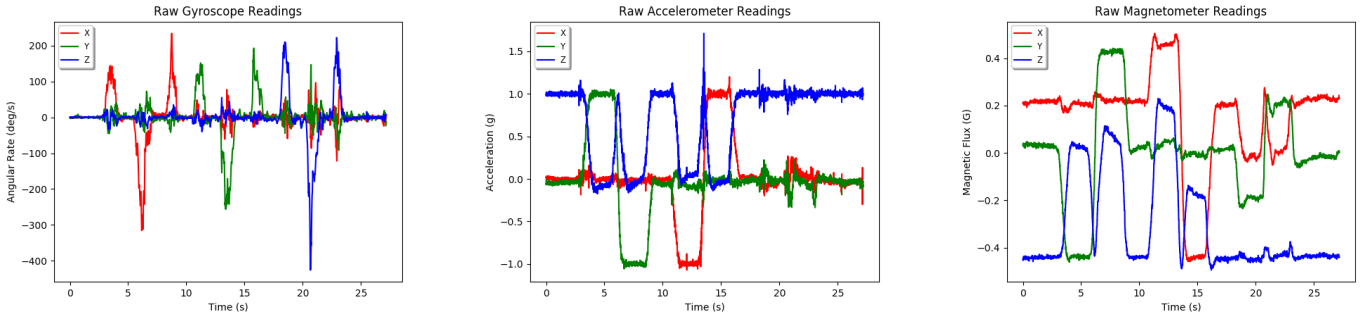

Figure 1: Raw sensor readings from the IMU.