

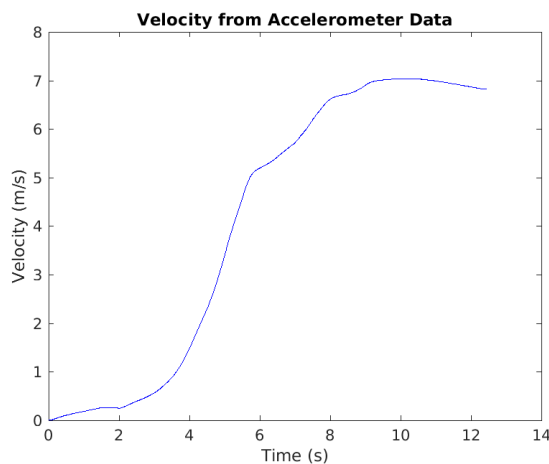
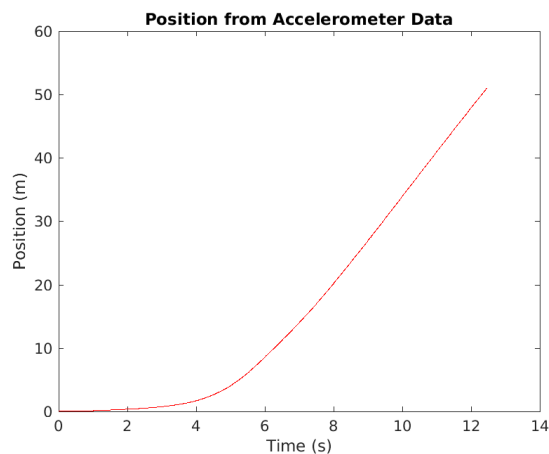
CE661 HW 3

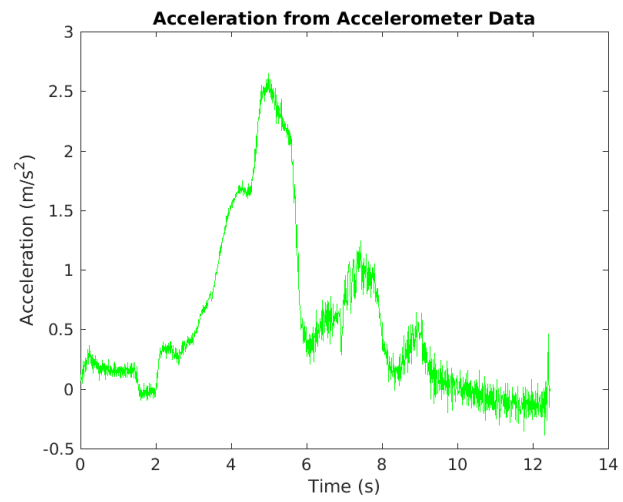
Ammar Kothari

1. ECI is Earth Centered Inertial and does not rotate.
2. Accelerometers measure specific force and may be reported in m/s^2 . Accelerometers measure angular rate of change and may be reported in radians/s.
3. The ISA would measure 1g acceleration upward. The difference between the stationary acceleration and free fall is 1g upward.
4. A gimbaled INS uses actuators to maintain the accelerometer alignment with a predefined frame. The angle of the actuators are the Tait-Bryan angles of the current pose. A strapdown INS reads data directly from the ISA to define its current pose.

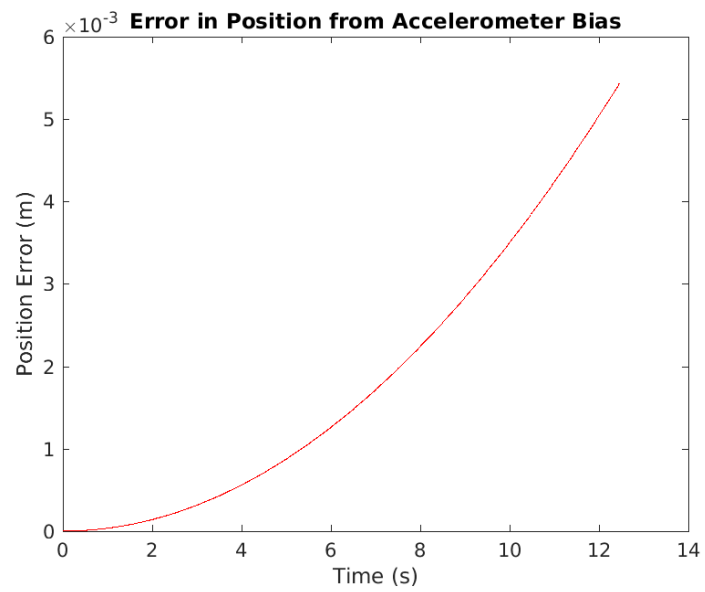
A gimbaled INS is more accurate than its strapdown counterpart. However, it has many more moving parts making it harder to maintain and more costly.

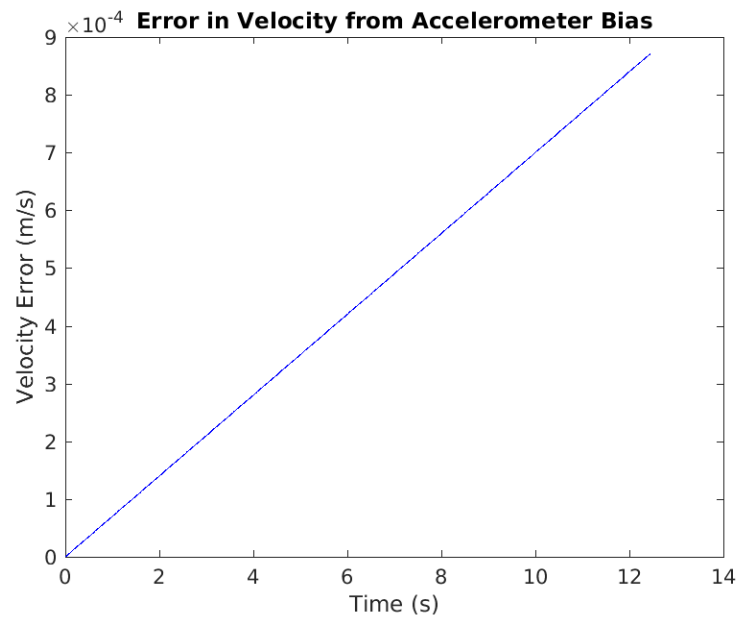
5. Position and Velocity plots





6. Error caused by bias in acceleration





7. The average down velocity was -9.80 m/s^2 . This is the value of gravity. The down axis was aligned with gravity. However, the negative value indicates that the sensitive direction was pointing downward in the car.