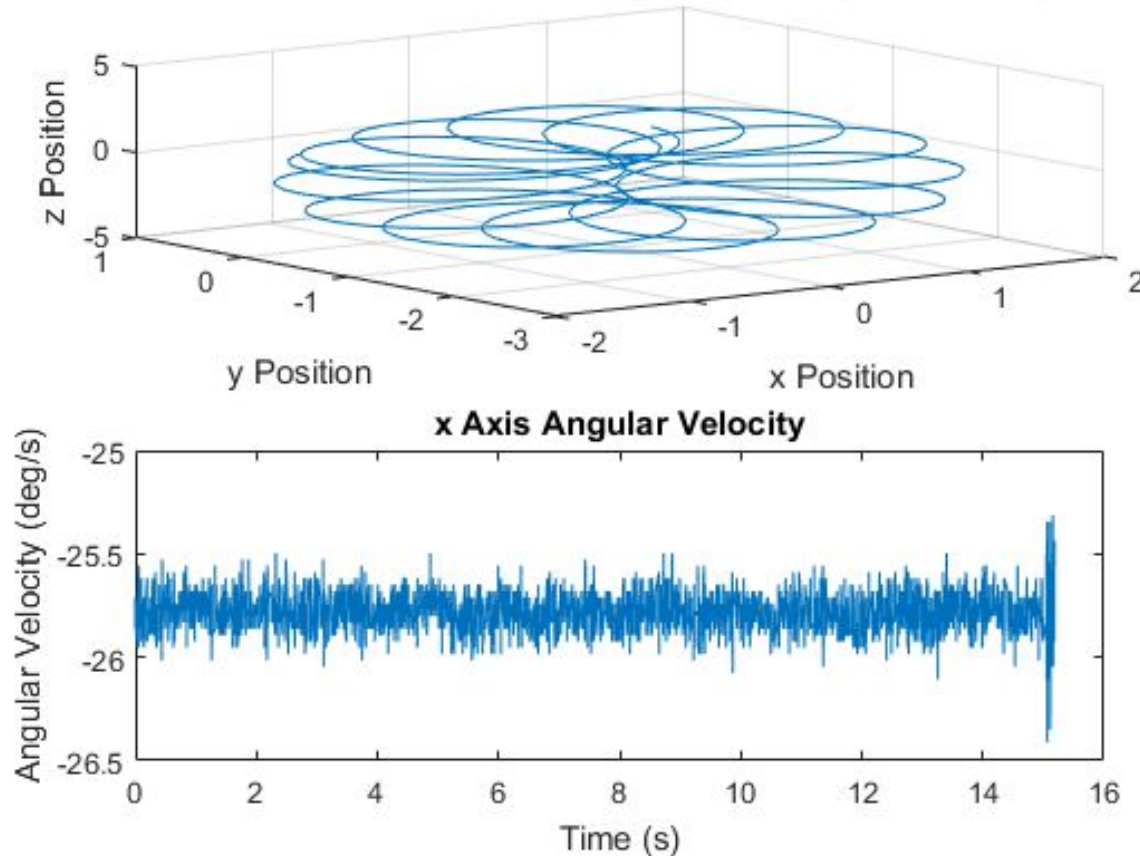


Inertial Wearable Sensors Presentation

4/12/2016

3-D Linear Position based on Relative Angular Velocity



Test Parameters

- Sensor placed on rotating LP player (rotates in z-axis).
- Duration: 15.18 s
- Capture Rate: 203.1 Hz

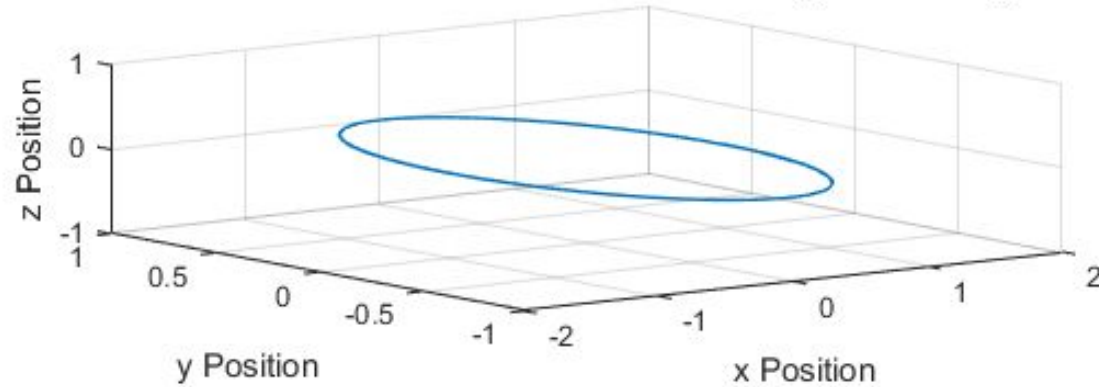
Results:

- Actual Z Distance: 4203 deg
- Expected Distance: 4099 deg
- Actual Z Velocity: 277 deg/s
- Expected Velocity: 270 deg/s

Raw Data

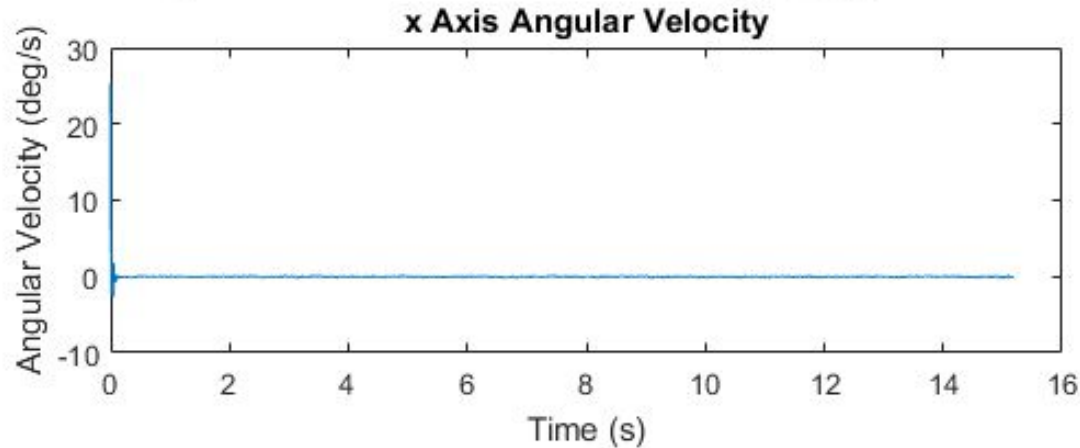
- Linear position found based on relative angular velocity.
- Position units are multiplied by radius to find actual position.

3-D Linear Position based on Relative Angular Velocity

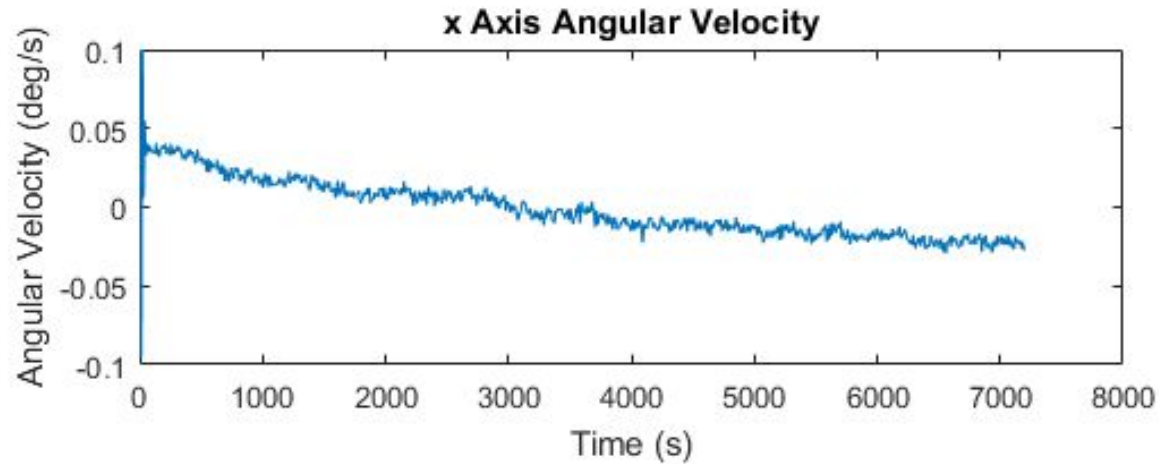
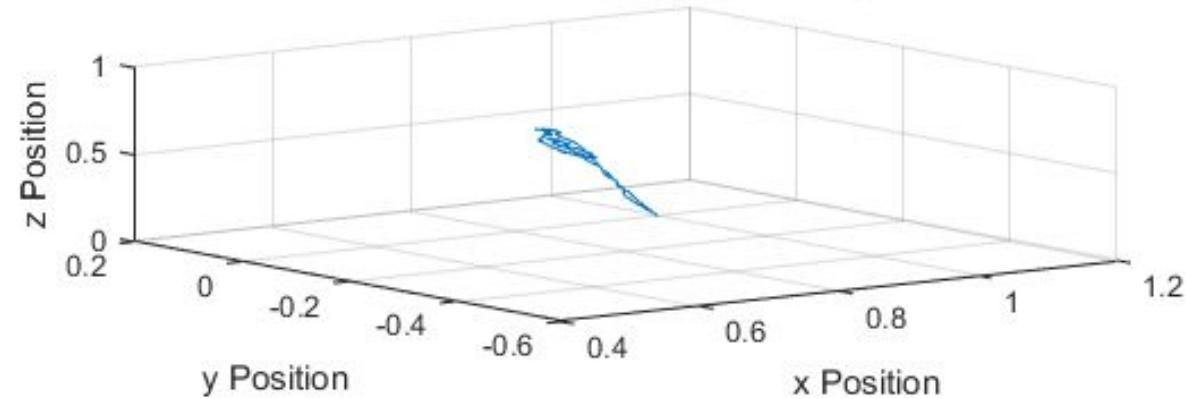


With Correction

- Angular velocity low pass filtered for noise
- Average velocity recorded while sensor stationary, treated as constant offset
- Offset subtracted velocity recorded in motion



3-D Linear Position based on Relative Angular Velocity



Test Parameters:

- Sensor stationary on undisturbed surface.
- Duration: 7199.2 sec (~2hr)
- Capture Rate: 203.0 Hz

Results:

- Voltage Drift (Defined as the difference in starting angular velocity subtracted by end angular velocity):
0.0597 degrees
- Slope of Drift:
 8.293×10^{-6} deg/s