Name: UP-LIMB-MT\_1

- SYSTEM OF INTEREST: human upper limb motion tracking during activities of daily living  
- GIVEN DATA/MODEL: accelerometer and gyroscope data from the upper arm and forearm  
- TO BE ESTIMATED: orientations of upper arm and forearm, hand-to-shoulder position  
- GROUND TRUTH: marker-based optical motion capture  
- APPROACH TO TAKE: online, EKF or UKF based on kinematic model of upper limb

Due:

* End Jan – Motivation, expected outcome, expected methods to use, how to interpret end result

Recording to evaluate joint angle calculation for arm and shoulder, especially in thepresence of magnetic disturbances. Every file corresponds to one trial. In each trial, a predefined movement is repeated 3 times (slow with stops, slow smooth and fast smooth), with synchronisation movements in between and a calibration movement at the beginning and at the end. In some trials, a magnetic disturbance (i.e. a metal plate) was present (seemeta.magnetic\_disturbance) and/or the subject tried to keep the shoulder fixed (meta.fixed\_shoulder) and/or the movements were varied so that the elbow joint was only used as a 1D joint (meta.emulate\_1D).

resampled to 75 Hz using linear interpolation to match IMU signal, synced using forearm acceleration (original 100 Hz data found in \_2)

Useful data:

* Imu
  + imu.upper\_arm.right.{acc,gyr,mag}
  + imu.upper\_arm2.right.{acc,gyr,mag}
  + imu.shoulder.right.{acc,gyr,mag}
  + imu.fore\_arm.right.{acc,gyr,mag}
* Optitrack
  + Use raw tag data, combine to find orientation

Approach:

Show Naiive approach without any model associated