Shen, Sijun

From: Bailey, Matthew
Sent: Monday, March 25, 2019 4:11 PM
To: Shen, Sijun; Sezgin, Emre
Subject: Location Data and Links
Attachments: ZLOCATIONS.csv.zip

Hello Sijun-

Please find a zipped csv file containing location data to correlate to the motion csv I provided earlier.

Here is some information on the location data:

- The latitude, longitude, and course information reported by the system: https://developer.apple.com/documentation/corelocation/cllocation and https://developer.apple.com/documentation/corelocation
    - ZALTITUDE: The altitude, measured in meters.
    - ZACTIVITYCONFIDENCE: The confidence that the motion data is accurate. 0= Low. 1 = Medium. 2= High.
    - ZCOURSE: The direction in which the device is traveling, measured in degrees and relative to due north.
    - ZHORIZONTALACCURACY: The radius of uncertainty for the location, measured in meters.
    - ZLATITUDE: The latitude in degrees.
    - ZLONGITUDE: The longitude in degrees.
    - ZSPEED: The instantaneous speed of the device, measured in meters per second.
    - ZTIMESTAMPEPOCH: Time stamp in Epoch
    - ZVERTICALACCURACY: The accuracy of the altitude value, measured in meters.
    - ZACTIVITYTYPE: Apple's gues at type of motion.
    - ZTIMESTAMPEST: Timestamp in EST

Here is some information on the Motion data provided earlier:

- Understanding Reference Frames and Device Attitude: https://developer.apple.com/documentation/coremotion/getting_processed_device-motion_data/understanding_reference_frames_and_device_attitude
- Library and documentation for motion related data: https://developer.apple.com/documentation/coremotion/cmdevicemotion
    - Rotations Rate Data: measurement of the device's rate of rotation around three axes (gyroscope data whose bias has been removed by Core Motion algorithms).
        - https://developer.apple.com/documentation/coremotion/cmdevicemotion/1615967-rotationrate
    - User Acceleration Data: The acceleration that the user is giving to the device.
        - https://developer.apple.com/documentation/coremotion/cmdevicemotion/1616149-useracceleration
    - Gravity Data: The gravity acceleration vector expressed in the device's reference frame.
        - https://developer.apple.com/documentation/coremotion/cmdevicemotion/1616164-gravity
    - Magnetic Field Data: Returns the magnetic field vector with respect to the device.

        - https://developer.apple.com/documentation/coremotion/cmdevicemotion/1616140-magneticfield
    - As stated earlier, In regards to Device Motion, we use the following reference frame: xMagneticNorthZVertical
        - This describes a reference frame in which the Z axis is vertical and the X axis points toward magnetic north. Note that using this reference frame may require device movement to calibrate the magnetometer.
        - The reference frame may be something we change during testing. Please let us know your thoughts.
        - https://developer.apple.com/documentation/coremotion/cmattitudereferenceframe/1616123-xmagneticnorthzvertical
        - https://developer.apple.com/documentation/coremotion/cmattitudereferenceframe

Best,
Matt

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