

Study Overview:

Procedure:

16 participants were asked to carry around a smartphone on their person for as often as was feasible for at least 8 weeks. Each participant was assigned a unique identifying name to keep the actual participant's identity confidential. Participants were instructed on how to operate the phone, activate the software, and charge the phones. The procedure they were given was to carry the phone on their person (in their pocket, in a pouch they wore around their necks, etc) continuously from when they woke up to until the battery ran out of charge (generally 4-5 hours) then charge the battery and repeat the procedure again. Most participants would get through a single charge cycle in a day, however several would often stop, recharge, and complete a second cycle in the course of a day. Participants only carried the phones during their awake hours. As with any early study, compliance can be a challenge, and there were days when participants may have missed a day, or had a technology malfunction that did not record information about them for that day, or in very short increments.

Devices:

The vast majority of the participants used LG Optimus S phones with an Android 2.2 or higher operating system to collect their data. There were a few participants who used a Samsung Galaxy or a Motorola Morrison.

Collection:

Data was collected continuously with programmed pauses each hour, on the hour to save the collected data, and package it on the device. As soon as the first session was paused, a new session would immediately begin and continue recording. There were some situations where the recording would not go on for a full hour, and those shorter segments are also included here.

The App:

An collection application was created for the purpose of enabling the phone to collect such data on participants. This application was created in Java, and is available for full analysis, understanding and documentation guidance. The application was designed to capture information from the accelerometers, microphone, battery, compass, GPS, light sensor and proximity sensor. This software is made available for your use and study under a Creative Commons 2.5 license.

Data Packets:

The general naming syntax of the packets are as follows:

HumDynLog_[PARTICIPANT NAME]_[PHONE IDENTIFIER]_[TIME STAMP OF START RECORDING {YYYYMMDD_HHMMSS}]_[TIME STAMP OF END RECORDING {YYYYMMDD_HHMMSS}]

All the data was compiled that include 7,800+ packets of files. The packets are structured with the following components:

- "hdl_accel_[PARTICIPANT_TIMESTAMP].bin" = Collection of accelerometer data points from participants. This data includes X,Y,Z axis data and for each of the 3 axes, the mean, absolute central moment, standard deviation, maximum deviation, power spectral density across four separate bands.
- "hdl_accel_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the accelerometer from the time the recording session was started to the time this specific packet was recorded.
- "hdl_audio_[PARTICIPANT_TIMESTAMP].bin" = Collection of audio/voice data points from the participants. Audio includes L1-norm, L2-norm, L-inf norm, power spectral density across four separate bands, 12 lowest mel-frequency cepstral coefficients.
- "hdl_audio_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to audio from the time the recording session was started to the time this specific packet was recorded.
- "hdl_batt_[PARTICIPANT_TIMESTAMP].bin" = Collection of battery power level measurements from the participant, collecting a percentage remaining of battery power and a timestamp.
- "hdl_batt_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the battery level recording from the time the recording session was started to the time this specific packet was recorded.
- "hdl_cmpss_[PARTICIPANT_TIMESTAMP].bin" = Collection of magnetometer (measures the strength of the magnetic field in three dimensions) data points from the participants. Compass includes maxX, magY, magZ measurements for each of the 3 axes: mean, absolute central moment, standard deviation, maximum deviation.
- "hdl_cmpss_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the compass from the time the user started carrying this specific device to the time this specific packet was recorded.
- "hdl_comms_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to communication and data transmission from the device from the time the recording session was started to the time this specific packet was recorded.
- "hdl_gps_[PARTICIPANT_TIMESTAMP].bin" = Collection of latitude and longitude coordinates of the participants location.
- "hdl_gps_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the GPS from the time the user started carrying this specific device to the time this specific packet was recorded.
- "hdl_light_[PARTICIPANT_TIMESTAMP].bin" = Collection of standard photodiode/ambient light sensor data points collected from the participants
- "hdl_light_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the light sensor from the time the

- user started carrying this specific device to the time this specific packet was recorded.
- "hdl_main_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to all messages displayed to the user on the phone from the time the user started carrying this specific device to the time this specific packet was recorded.
 - "hdl_meta_[PARTICIPANT].csv" = A log of device details and general session start and end timestamps for the data packet
 - "hdl_meta_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the checking and recording of meta data information from the time the user started carrying this specific device to the time this specific packet was recorded.
 - "hdl_prox_[PARTICIPANT_TIMESTAMP].bin" = Collection of standard proximity points to the participant's body to indicate how close a phone is to the body.
 - "hdl_prox_[PARTICIPANT].log" = A log of all activities prompted and performed by the application relating to the proximity sensor from the time the user started carrying this specific device to the time this specific packet was recorded.
 - "hdl_zip_[PARTICIPANT].log" = A log of all streams of files recorded and stored from the time the user started carrying this specific device to the time this specific packet was recorded.