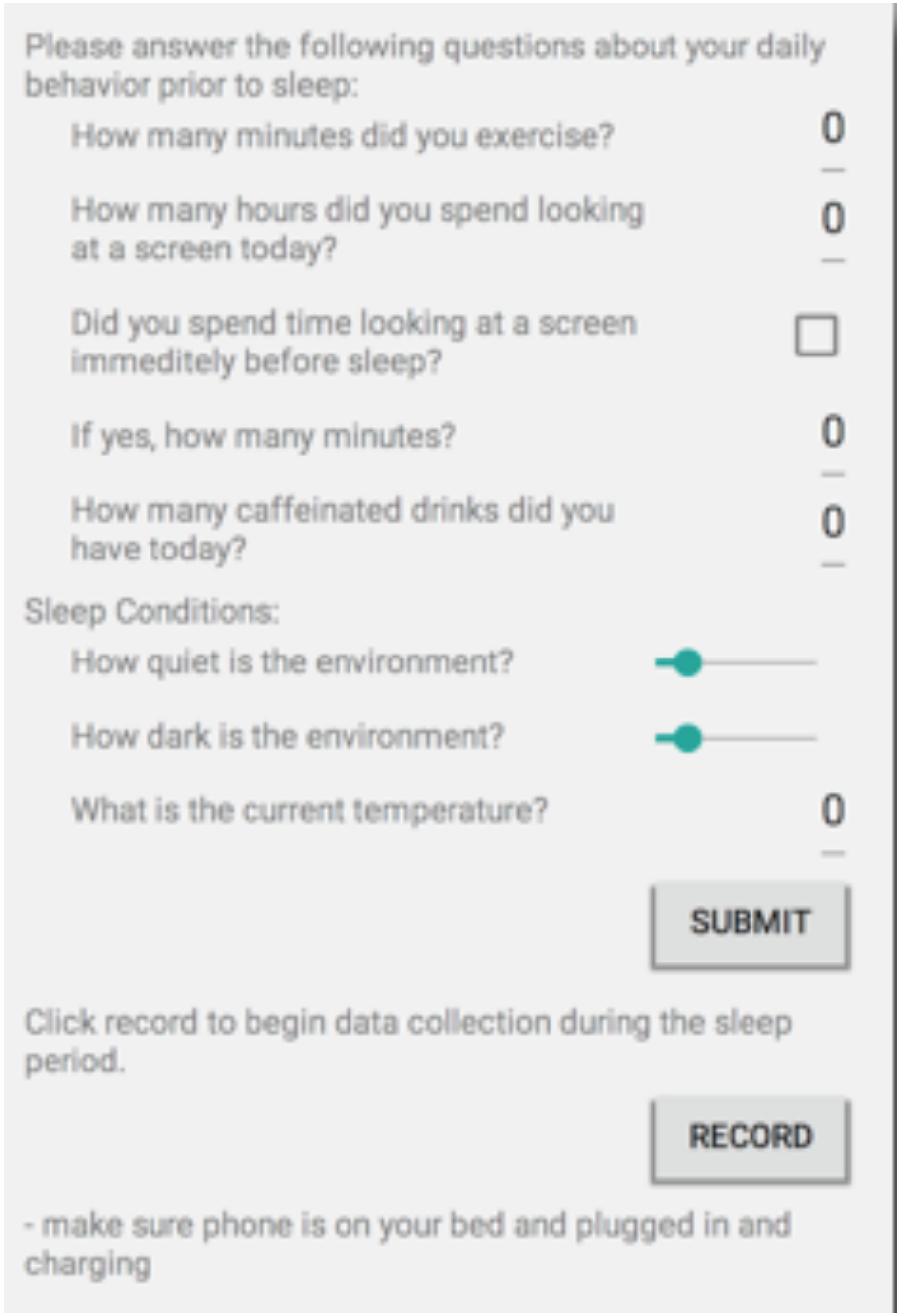
Do we dream or do we have a nightmare?

- Most current sleep apps measure sleep movement and attempt to wake user up at best time or help the user fall asleep
- This ignores the underlying reasons why one is not sleeping well
- No current app attempts to relate sleep pattern to their daily behavior
- Sleep is majorly impacted by many different factors… Why is there not an app that tracks these factors too?

Approach

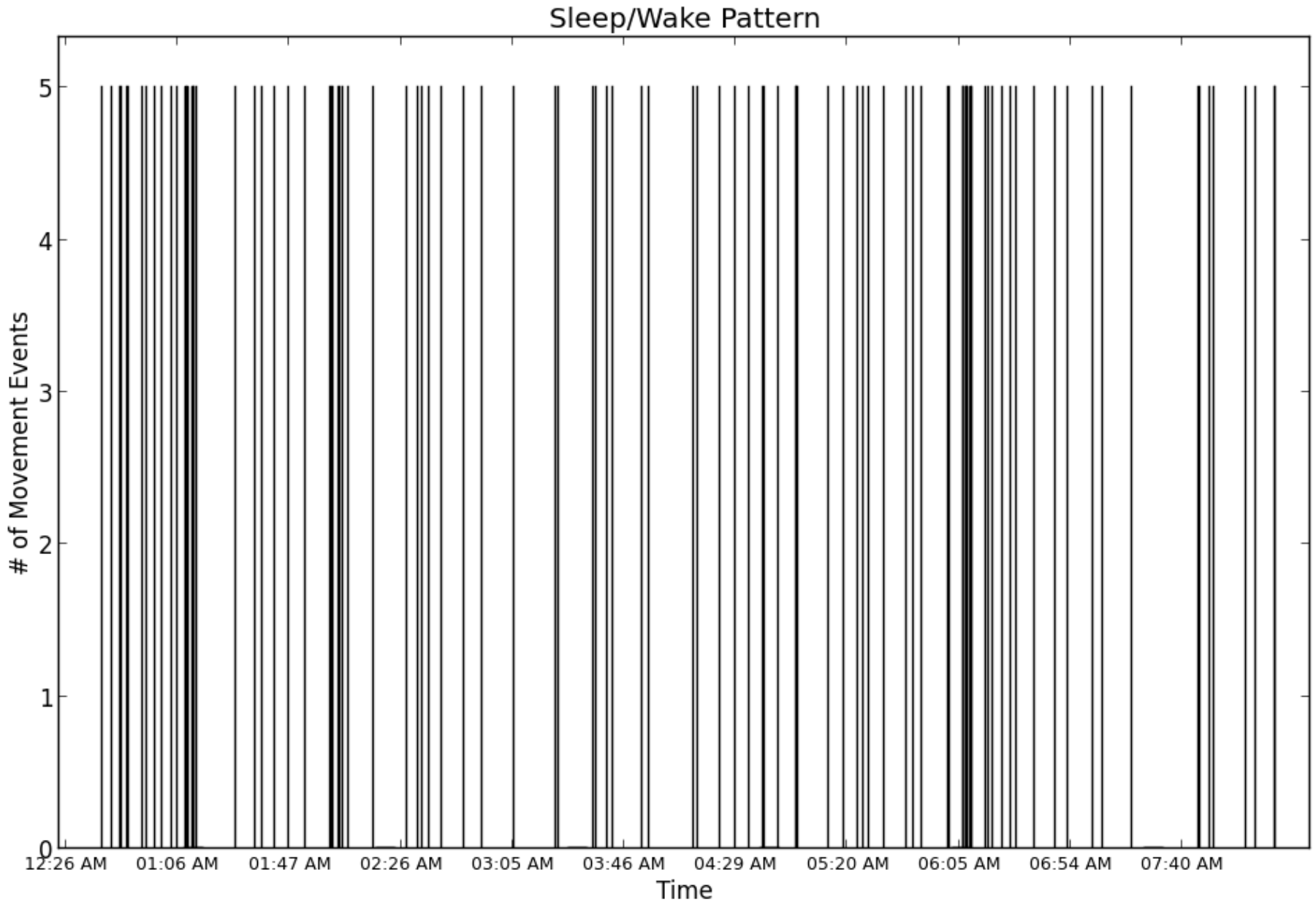
- Android application collects daily behavior information and records accelerometer data during sleep, which syncs with server running in Google App Engine.
- Analyze the accelerometer data to determine movement during sleep and the different sleep phases
- Analyze relationships between user's daily behavior, sleep conditions, and sleep/wake patterns to determine positive/negative influences



Sample entry for data recorded during sleep:

- "sensor_type" = "accelerometer"
- "time" = 1424693685510
- "x_acc" = [0.2745819, 0.23535156, 0.2647705, 0.2647705, 0.22555542, 0.24516296, 0.24516296, 0.21574402, 0.24516296, 0.21574402, …]
- "y_acc" = [0.06864929, 0.039215088, 0.009796143, -0.019607544, 0.05883789, 0.04902649, 0.088256836, 0.029418945, 0.05883789, 0.039230347, …]
- "z_acc" = [9.728195, 9.855682, 9.76741, 9.87529, 9.855682, 9.728195, 9.777222, 9.757614, 9.806656, 9.83606, …]

Preliminary Results



Conclusion and short-term plans

- (1) Figure out best algorithm to determine sleep movement/wake patterns (potentially training a classifier to detect outliers)
- (2) Allow multiple concurrent users to use app
- (2) Collect data from multiple users (5-10) over a period of 1-2 weeks
- (3) Begin to explore relationship data between factors and sleep patterns