

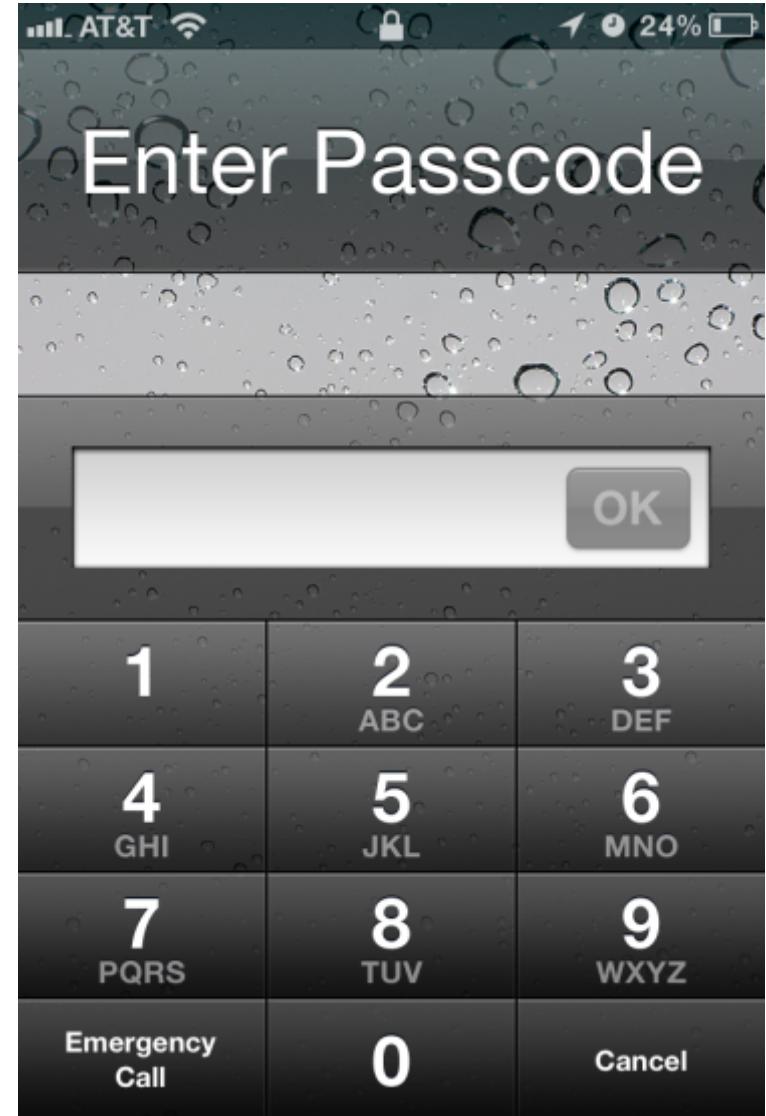


Easy and Secure Gesture Based Authentication

By Harrison Yu and Alan Chiang

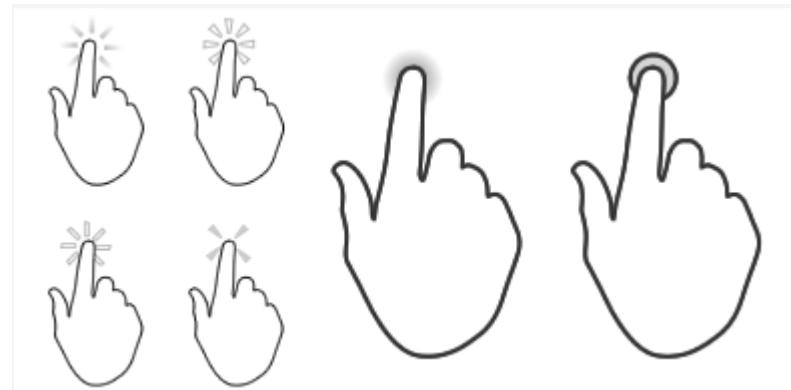
The Problem

- Authentication with a password is slow and tedious
- Authentication in public isn't very secure
- What if you could authenticate, quickly, easily, and in public, without compromising security, even with someone watching?



Introducing Easy and Secure Authentication

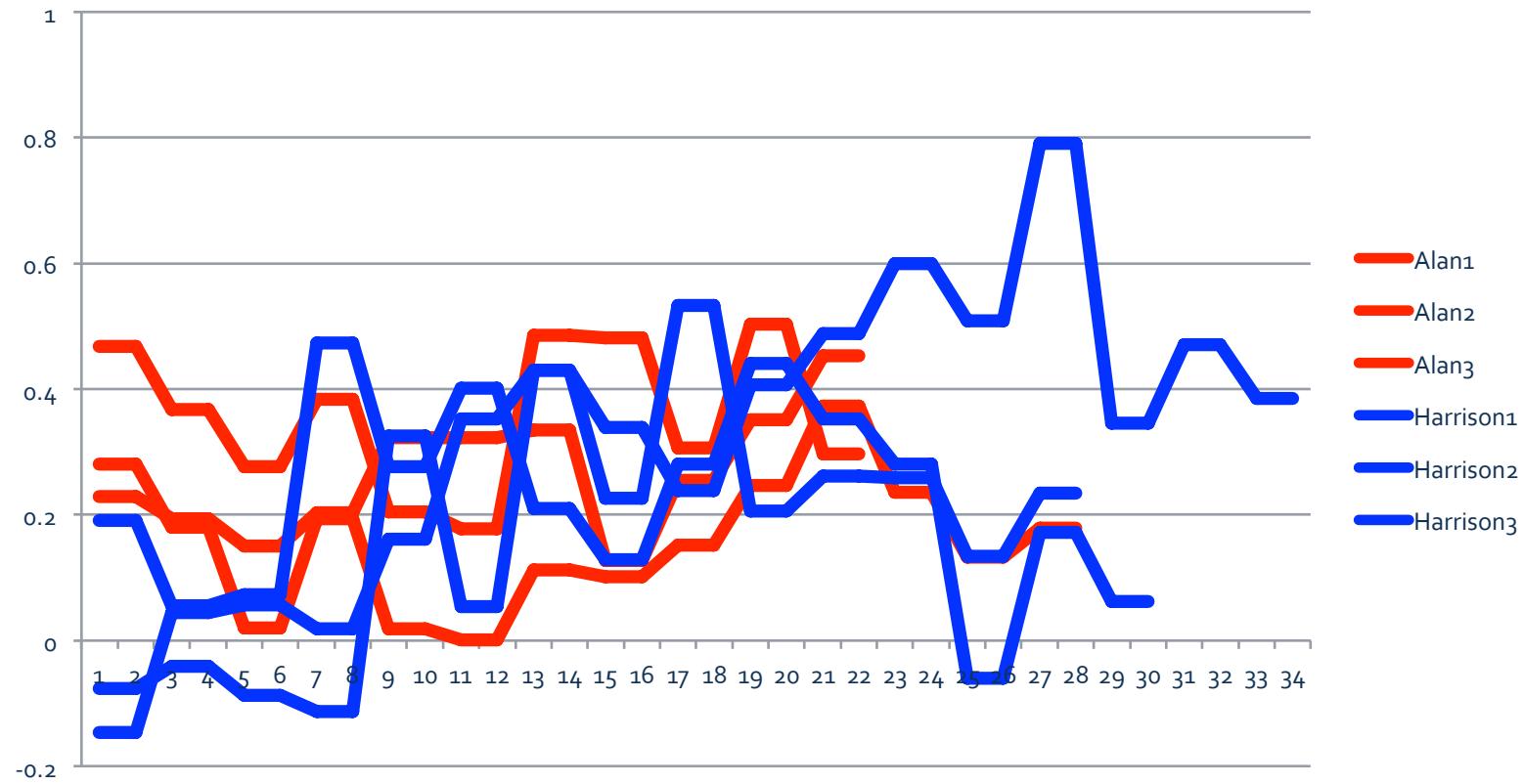
- + Core Idea: Everyone performs the same gesture slightly differently due to biological and habitual differences
- + What if we could capture these differences and use them to identify users?



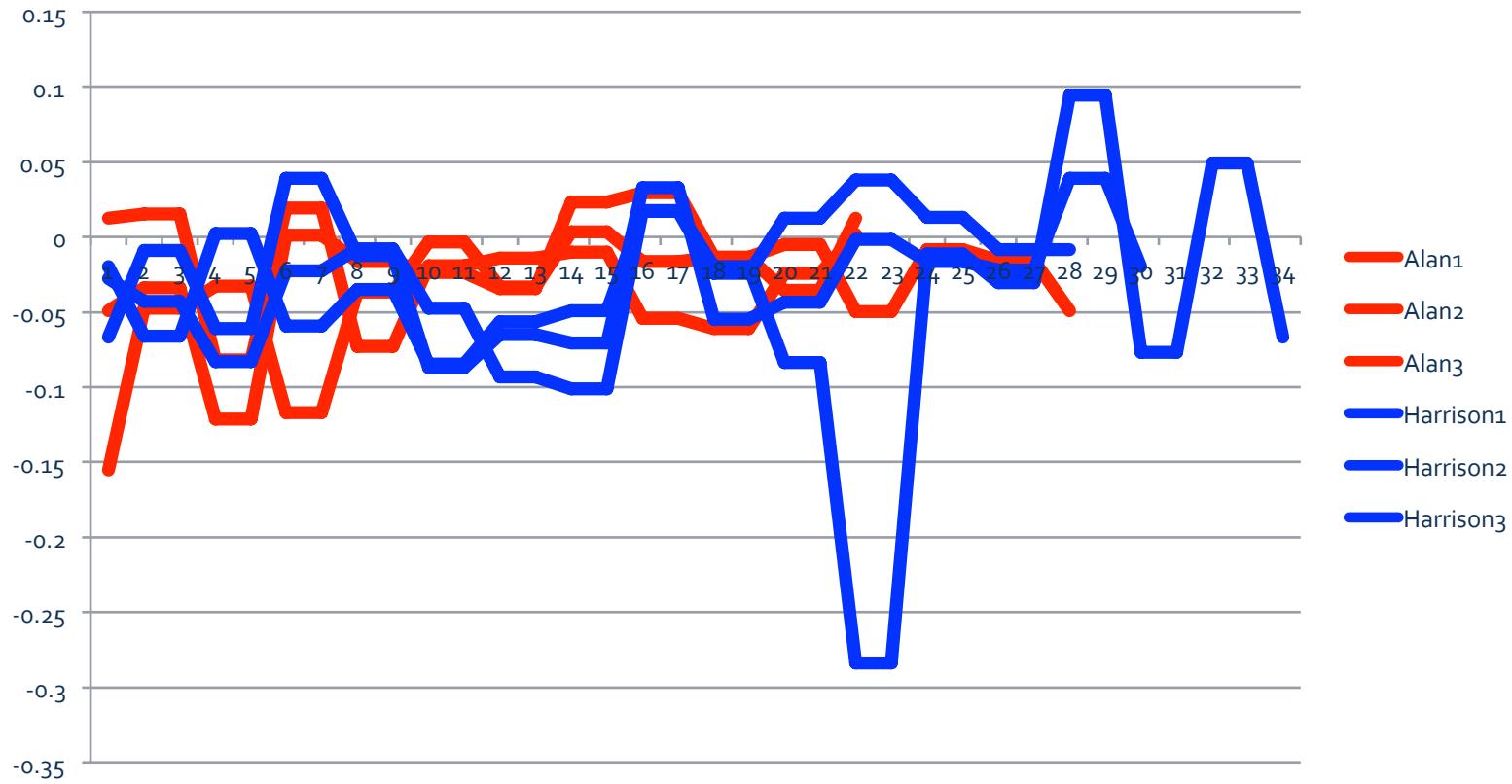
The Challenge

- + Capturing the subtleties that can't be discerned by sight
- + Extremely small and unbalanced dataset
- + False positives vs. false negatives
- + Selecting and extracting appropriate features
- + Certain features have high/low variance, even for the same gesture performed by the same person

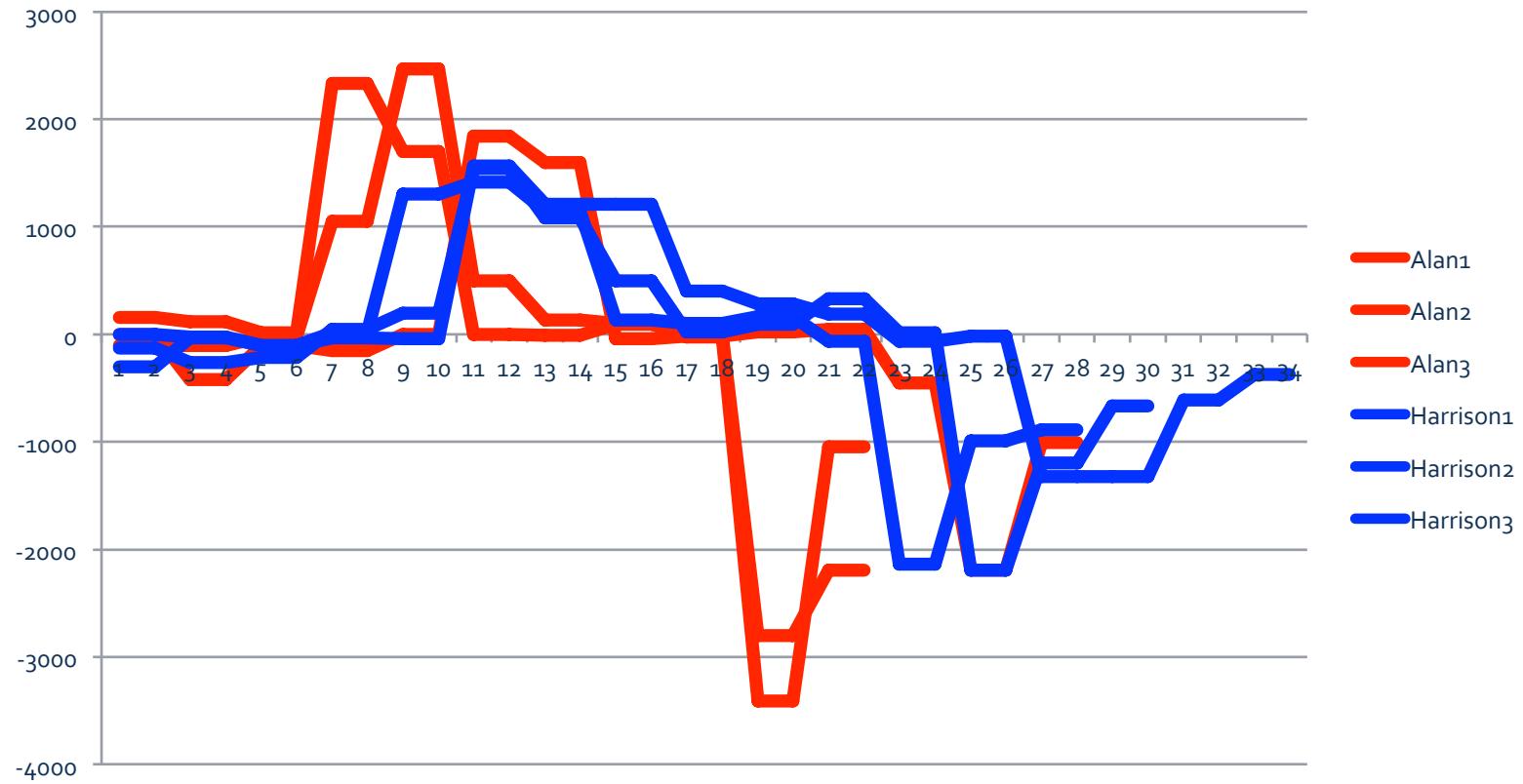
Accelerometer



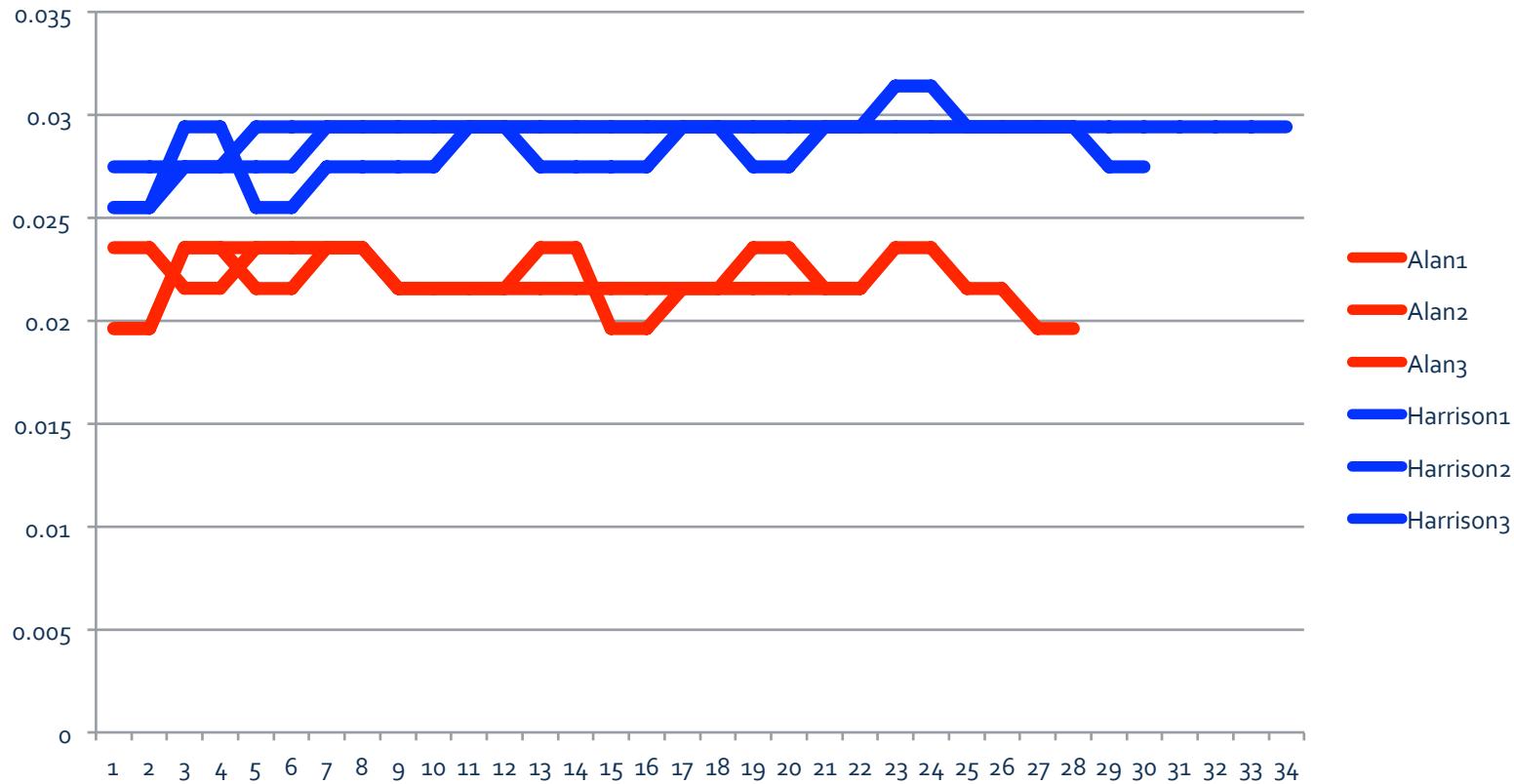
Gyroscope



Velocity Of Gesture

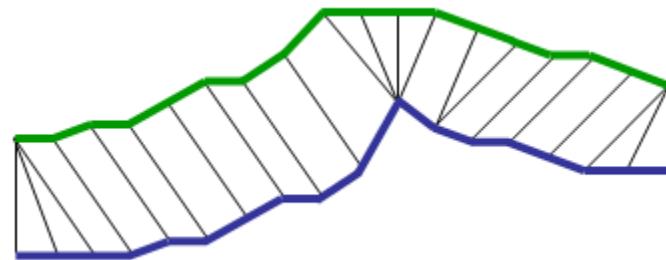


Finger Size Of Gesture



Our Solution

- + Dynamic Time Warping (DTW)
- + DTW used to compute similarity between two sequences that vary in time
- + Gaussian Naïve Bayes (GNB)
- + Probabilistic classifier assuming Gaussian distribution



Demo!

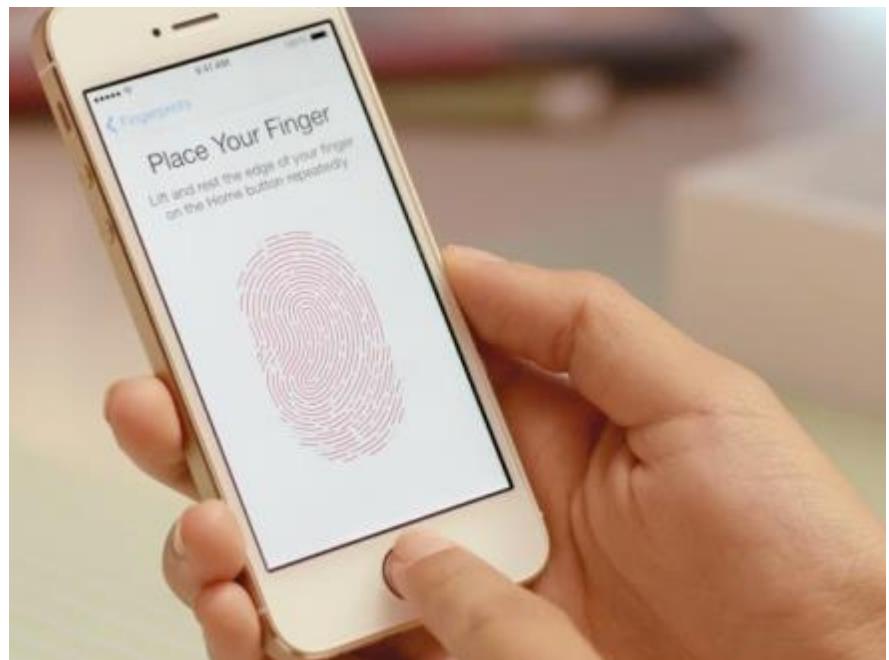


Evaluation Results

- + Reliability highly dependent on gesture. In general, slow gestures with straight lines seem to work best.
- + We decided it was better to have more false negatives than false positives. Depending on the application, it could be too sensitive.

Future Work

- + Future of mobile authentication seems to be headed towards biometrics such as fingerprint/facial recognition
- + Combining gesture recognition with biometrics would make authentication more reliable/easier



Questions?

