What is subtlety and why do I care?

Gestures that do not disrupt a social event

Wearable Computing

AI Perspective - Judge subtlety Automatically

Gesture Subtlety Using Accelerometer
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Related Works

Applications:
- Preferentially annotate meeting segments (Kern et al., 2003)
- Augment "Dual-Purpose Speech" (Starner et al., 2010)

Training a computer to assess gesture subtlety remains an open problem!
...maybe subtlety is open in other domains too
Approach

Data Collection

Gesture or not ??

- kNN - DTW, euclidean norm
- Regression - feature vectors - integrate acceleration and gyroscope data
- Smoothing - 5 tap filtering
Discussion - 1

- kNN with DTW - best $k = 8$, error = 0.1009

- kNN with euclidean norm - best $k = 3$, error = 0.1324
Discussion 2 - Regression analysis

- features - max and avg : accels, vels, jerk ; energy; distance ; max Z displacement; etc

All Features: avg error = 0.1104

Only Energy avg error = 0.1249
Conclusion

What Have we learned?
- User study and sampling matters!
- For our data, both approaches seem to work with similar accuracy
- It can be done!

Future Work
- Better feature selection (PCA)
- Two methodologies: time series and time independent features.
- A combination of those, involving a decision tree taking into account the distance to the closest neighbor or boosting