Reality Mining: Using Cellular Data to Extract Innate Features of Behavioral Pattern for Personality Prediction

Madhulika Mukherjee, Shreya
B.Tech. IT and Mathematical Innovation, VII Semester

Cluster Innovation Centre, University of Delhi
Laboratory for Pattern Engineering

MOBILE DATA

Thirty six metrics that were calculated for each volunteer using phone data

- Regularity
  (Inter event time, Home Regularity)
- Diversity
  (Entropy of contacts, contacts to interaction ratio, number of contacts)
- Spatial behavior
  (Radius of gyration, distance traveled, entropy of places)
- Active behavior
  (response rate, response latency, percent initiated)
- Basic phone use (number of interactions)

IDEA

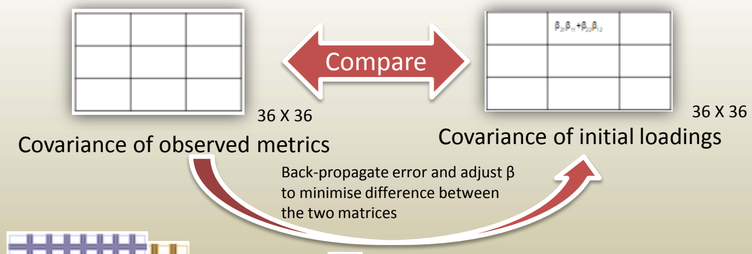
Factor Analysis
Learn how cellphone usage affects the dependence of each adjective on each metric

Factors <- adjectives

Example: Neuroticism <- anxiety, touchy (adjectives)

Eigenpersonality
Map the outcome to an *eigenpersonality* for each participant

FACTOR ANALYSIS



EIGENPERSONALITY

Recursive Learning using Tensor Network

VALIDATION & RESULTS

Credibility of API

Online social data

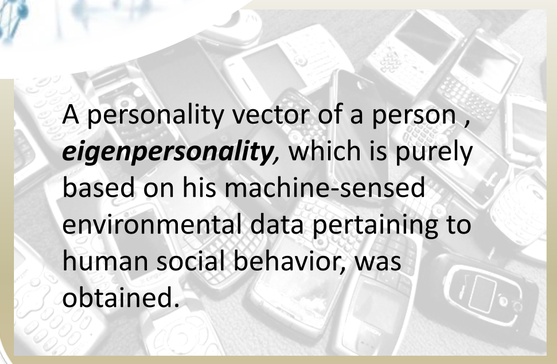
Apply Magic Sauce API

API prediction

Comparison

Big 5 personality test

Accuracy : 74.27%



A personality vector of a person , ***eigenpersonality,*** which is purely based on his machine-sensed environmental data pertaining to human social behavior, was obtained.

FUTURE WORK

With each personality vector, we plan to recommend the most apt survey to a user and stabilize his utility matrix in as less iterations as possible

ABSTRACT

Personality determination and mapping these to business applications have long since happened by analysing written texts and other online social networking attributes of the person.

However, consciously given written evidence is a poor indicator of personality. In our project, we make use of cellphone data that measure the latent and repetitive patterns of a person's daily life – like movement patterns, frequency of conversation responses, etc. With these we determine what we call an eigenbehaviour using factor analysis. This culminates to form the eigenpersonality, that we compare with the person's Big 5 personality traits.

REFERENCES

- Pentland, Alex, et al. "Predicting people personality using novel mobile phone-based metrics", Social Computing, Behavorial-Cultural Modeling and Prediction, 2013.
- Pentland , Alex, et al. "Eigenbehavior: Identifying structure in routine", Springer-Verlag, 2009
- http://applymagicsauce.com/ - API by Cambridge University
- http://www.outofservice.com/bigfive/ - Online personality test

Acknowledgement
We would like give our sincere gratitude to Ir. Abhijeet Parmar for his invaluable inputs and insightful guidance.