Personalized prediction application for essential fulfilment

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Summary

An android application to log, monitor, and predict various need (e.g. sleep, social, movement) and their correlation to the users wants (e.g. happiness, productivity, anxiety level).
Here statistics and machine learning is used to find correlation between the given inputs.

Introduction

Quality of life is strongly related to how well the individual is to fulfil some basic human needs, e.g., movement socializing [1,2,3].
Individuals values the needs differently; some might be content by being more social, while others need to focus more on exercise.
This android app attempt to predict and find correlations what the user needs to focus on to improve the wants on by using personalised statistics and machine learning.

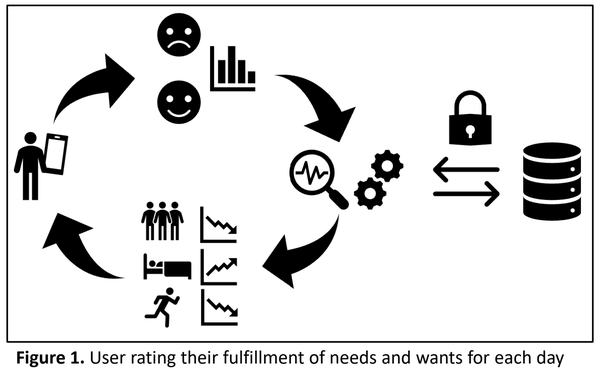

Figure 1. User rating their fulfillment of needs and wants for each day that gets processed and outputted to the user for them to focus on what need correlates most to their wants. The data is also stored remotely in a secure database.

Separates from others

Normally other application focus on hitting a pre-set goal. In presented app it adapt to the user and attempt to predict what needs need fulfilling to increase their quality of life.

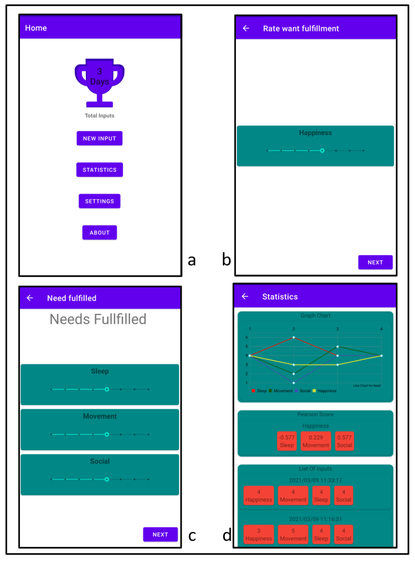

Figure 2. Showcasing a user inputting "new input" with the current default set of needs and wants.

Personalization

It allowing the user to add custom needs and wants, as seen in **Figure 3.** user has added "Productive" as a want and "Play games" as a need. Adding/removing these will not interfere with previous analysis.

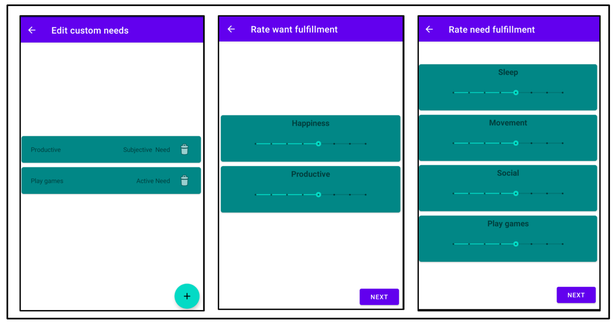

Figure 3. Example of personalization to the user by allowing for custom wants and needs

Method of analysing

- Pearson/Spearman correlation
- Machine Learning (Naïve bayes)
- Plots, Line Plot (MPAndroidPlot[4])

Pearson Correlation Coefficient

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2(y_i - \bar{y})^2}}$$

Naïve Bayes Theorem

$$P(A|B) = \frac{P(B|A)\,P(A)}{P(B)}$$

Challenges

- Learning tools
  - Kotlin
  - Android development
- Finding right libraries
- Combining various technologies/methods
  - E.g. App dev with ML and statistics
  - Testing and in Android development

Remaining Work

- Better human readability
- Implementing more analytical methods
- Avoiding cold starts
  - Simulate data
  - Pre-collected data
- Interval statistics (week/month/year)
- Set up external secure database
- Cohort analysis
- User testing

Future Work

- Easier access of data allowing external study (API)
- Releasing app to retailers (e.g. App store)
- Adapt to iOS

Acknowledgments

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References

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