Machine learning approaches to Reality Mining: The Reality Mining dataset

1 Description

One of the most challenging areas for the application of machine learning algorithms is Reality Mining [1], in particular the understanding of social dynamics from the analysis of data describing social interactions (e.g., data about mobile communications, coworking interactions, information exchange, computer use, etc.). Several recent projects have proposed experiments in which this type of data is collected [2, 3, 1, 4, 5] and a number of approaches that analyze this data have been also published [6, 7, 8, 9, 10, 11]. However, the question of exploring new and creative applications of machine learning in this domain is relevant.

In this project the students will use the *Reality Mining Dataset* `http://realitycommons.media.mit.edu/realitymining.html` [1] which contains mobile data from 75 students or faculty in the MIT Media Laboratory, and 25 incoming students at the MIT Sloan business school adjacent to the Media Laboratory. The goal of the experiment was to explore the capabilities of the smart phones to enable social scientists to investigate human interactions.

2 Objectives

The objective of this project is to apply one supervised or unsupervised machine learning algorithm (except those based on NNs for which a different project is proposed) to the *Reality Mining* dataset that allow to produce insights about the social interactions captured by the data. The student should: 1) Select the approach to apply to the data and the Python implementation to use. 2) Preprocess the data as required for the approach chosen. 3) Apply the algorithm, describe the results, and explain why these results are useful, interesting, or reveal any insight about the process.

As in other projects, a report should describe the characteristics of the design, implementation, and results. A Jupyter notebook should include calls to the implemented function that illustrate the way it works.

3 Suggestions

- Read the description of the dataset in [1] and other papers that analyze this data.
- Think about what are relevant questions for the scenario that the experiment covers. Determine whether the available ML approaches are useful to answer these questions.
- Select any of the available ML Python libraries and implement the idea.

References

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