Supporting Big Mobile Data Mining

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In his article Big Mobile Data Mining: Good or Evil?, Mirco Musolesi discusses the emerging trend of mining large amounts of data from mobile phones. While this data poses exciting possibilities for computer scientists, concerns of privacy overshadow this practice. Mirco never explicitly defines big mobile data mining as good or bad in his article, but does state that “I’m personally not against the collection of mobile data by companies and other organizations” (Musolesi, p. 80). This statement, along with the general tone of the article, seems to indicate that Musolesi feels that data mining mobile devices is something worth pursuing. The purpose of this paper is to analyze other sources on the topic to get a greater sense of the prevailing opinion on the subject of data mining mobile devices and the risk and rewards that come with such endeavors. Ultimately, Musolesi’s assessment of the benefits being greater than the dangers seems to be the consensus among others in the field.

In Musolesi’s article he discusses many of the benefits that can be gained by mobile data mining. Currently, applications such as GoogleNow provide users with information based on their location and interests. Some examples of this include the current weather, information on sports teams the user follows, or links the application feels are relevant to the user based on past search history. Predictive algorithms are also being developed, which can be used to warn users of the amount of traffic on routes they typically drive, such as to and from work. While these uses provide value to the end-users, none benefit society at large. However, Musolesi does list some uses that can be used for good. “Mobile big data can be used for ‘good’ – for example, to improve transportation is developing countries, devise strategies for epidemic containment, or study social response during major disasters” (Musolesi, p 79). Musolesi goes on to list other applications such as developing mental health intervention strategies and better allocation of law enforcement resources, while simultaneously providing data on predictive factor that lead to high crime areas.

While mobile data mining seemingly has endless possibilities of ways to improve our lives, it is not without risk. Musolesi’s biggest concern with data mining is privacy. By collecting location and trajectory data, companies and government organizations can learn a lot about users and their patterns. This is further compounded by the risk of this data falling into malicious hands. While not particularly malicious, organizations that specialize in predictive and suggestion could be exploiting users’ trust by making suggestions based off financial incentive rather than helping users. Another concern Musolesi has with mobile data mining is the lack of education by the general public. This lack of understanding creates an environment conducive to exploitation. Musolesi suggests increasing the amount of computer science taught in school to help spread this knowledge (Musolesi, p 80).

**Outside Opinions**

To get a better understanding of the perception of big mobile data mining within the computer science community, more articles were consulted. Two of those articles are highlighted to provide additional positive uses for mobile data mining. At the same time, these articles raise more concerns about privacy, but touch on steps that are being taken to reduce these issues.

In MobileMiner: Mining Your Frequent Patterns on Your Phone, the authors discuss the benefits found from mining for co-occurrence patterns on users’ phones. These patterns represent events that happen repeatedly near each other. An example provided was a user who would read news applications while having breakfast. “Such a pattern could be used [to] preload news content and news apps to memory ahead of time to reduce loading delays and improve user experience” (MobileMiner, p 390). Other examples given consist of predicting outgoing phone calls based on events, or opening work folders in the afternoon. This same pattern detection can also be used to suggest other behavior when patterns that are not beneficial are uncovered. An example of this would be forgetting to charge the user’s phone when going to sleep. These patterns could be used to remind users to charge their phone when the phone is below a certain charge and the time is near when the user typically goes to sleep.

While MobileMiner shines a more positive light on data mining, possibly for viability reasons, the article Primacy in Mobility Data Mining takes a harder look at the issue of privacy in this new area. As the authors state, “Although mobility data represents a very useful source of information, the sharing of user location or movement information raises serious privacy concerns that need to be addressed in order for data mining to be accepted in this domain (Privacy, p 1). The authors then highlight four other articles that discuss steps being taken by groups to anonymize users’ location data.

**Conclusion**

The field of mobile data mining is exploding. Companies are finding new ways to use this data to provide value to their customers, while others are using this data to solve problems such as transportation in developing countries. The possibilities are exciting; however, privacy concerns are still a large problem that needs addressed. As evidenced in the Privacy in Mobility Data Mining paper, many different solutions are being tested and implemented to protect users’ privacy. Because of this, Musolesi’s assessment of data mining’s benefits outweighing the risks appears valid.

References

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