## 1. A First Look at Human Values-Violation in App Reviews

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**Abstract:** Ubiquitous technologies such as mobile software applications (mobile apps) have a tremendous influence on the evolution of the social, cultural, economic, and political facets of life in society. Mobile apps fulfil many practical purposes for users including entertainment, transportation, financial management, etc. Given the ubiquity of mobile apps in the lives of individuals and the consequent effect of these technologies on society, it is essential to consider the relationship between human values and the development and deployment of mobile apps. The many negative consequences of violating human values such as privacy, fairness or social justice by technology have been documented in recent times. If we can detect these violations in a timely manner, developers can look to better address them. To understand the violation of human values in a range of common mobile apps, we analysed 22,119 app reviews from Google Play Store using natural language processing techniques. We base our values violation detection approach on a widely accepted model of human values; the Schwartz theory of basic human values. The results of our analysis show that 26.5% of the reviews contained text indicating user perceived violations of human values. We found that benevolence and self-direction were the most violated value categories, and conformity and tradition were the least violated categories. Our results also highlight the need for a proactive approach to the alignment of values amongst stakeholders and the use of app reviews as a valuable additional source for mining values requirements. (0 refs)
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**Uncontrolled terms:** human values-violation - mobile software applications - common mobile apps - 22 app reviews - 119 app reviews - values violation detection approach - basic human values - user perceived violations - violated value categories - mining values requirements
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