Exploring Ethical Requirements Elicitation for Applications in the Context of AI*

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Abstract. *Ethical concerns arises from the proliferation of Artificial Intelligence (AI) based systems in use. AI ethics has been approached mainly in guidelines and principles, not providing enough practical guidance for developers. Hence, we aim to present RE4AI Ethical Guide and its evaluation. We used the Design Science Research methodology to understand the problem, present the guide and evaluate it through a survey. The Guide is composed of 26 cards across 11 principles. Our preliminary results reveal that it has the potential to facilitate the elicitation of ethical requirements. Thus, we contribute to bridge the gap between principles and practice by assisting developers to elicit ethical requirements and operationalise ethics in AI.*

Resumo. *As preocupações éticas surgem da proliferação de sistemas baseados em Inteligência Artificial (IA) em uso. A ética em IA tem sido abordada principalmente em diretrizes e princípios, não fornecendo orientação prática suficiente para os desenvolvedores. Apresentamos o RE4AI Ethical Guide e sua avaliação, utilizando a metodologia Design Science Research para entender o problema, apresentar o Guia e avaliá-lo através de um survey. O Guia é composto de 26 cartas em 11 princípios. Nossos resultados preliminares revelam que ele tem o potencial de facilitar a elicitação de requisitos éticos. Assim, contribuímos para preencher a lacuna entre os princípios e a prática, ajudando os desenvolvedores a eliciar as requisitos éticos e operacionalizar a ética em IA.*

1. Introduction

The evolution of the emergence of software that makes use of Artificial Intelligence (AI) techniques, mostly Machine Learning (ML), amplifies the manifestations of accidents and the awareness of the associated ethical issues. AI-based systems developed without proper ethical cautions are prone to negatively impact society at large, e.g., in criminal justice, education, healthcare. During the requirements elicitation phase there is a greater interaction between different actors involved in software development and its use, providing a fertile environment for debate on ethical issues, and there is a reduction in additional work by considering ethical issues in the early stages of software development, rather than as an afterthought.

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To mitigate AI-based systems ethical issues, the aim of this work is to provide a Guide for Artificial Intelligence Ethical Requirements Elicitation (RE4AI Ethical Guide). The Guide will help software development teams to elicit ethical requirements for AI, in the first phase of Software Development Life Cycle (SDLC). The Guide consists of a deck of 26 cards across 11 ethical principles. The users will answer the questions presented in the cards and the answer will then be user stories – ethical requirements – to be included in the sprint backlog. For its creation, the Design Science Research methodology was adopted in order to understand the problem, develop a prototype and evaluate it through a survey with undergraduate and graduate students.

2. RE4AI Ethical Guide and its Evaluation

The RE4AI Ethical Guide is available at `https://josesiqueira.github.io/RE4AIEthicalGuide/index.html` and its source code at `https://github.com/josesiqueira/RE4AIEthicalGuide`. It was evaluated through a survey with 40 undergraduate and graduate students who evaluated the Guide through an online questionnaire. We identified 6 perceived positive points, such as: a) the support information presented is adequate for understanding and use; b) the questions contained in the cards are easy to understand – objective and clear; c) the use of the Guide helps the creation of user stories through the questions in the cards; d) there is an increase in ethical awareness through the use of the Guide; e) applicability of the Guide in the requirements elicitation phase; f) there is an interest from the participants in using the guide in the requirements elicitation phase in their future projects.

3. Final Remarks

The main results of the dissertation have produced the following publications: [Cerqueira et al. 2021a, Cerqueira et al. 2021b, Cerqueira et al. 2022]. It is worth mentioning that this work was awarded by the XVIII Brazilian Symposium on Information Systems. Our findings suggest that the RE4AI Ethical Guide is perceived to be of great interest by participants, receiving an overall positive evaluation with practicality and usability offering help to be used in practice, thus, it contributes to bridge the gap between high-level and abstract principles and practice.

References

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