

Generation of probabilistic synthetic data for serious games: a case study on cyberbullying

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Abstract-

**Synthetic data generation has been a growing area of research in recent years. However, its potential applications in serious games have yet to be thoroughly explored. Advances in this field could anticipate data modeling and analysis, as well as speed up the development process. To fill this gap in the literature, we propose a simulator architecture for generating probabilistic synthetic data for decision-based serious games. This architecture is designed to be versatile and modular so that it can be used by other researchers on similar problems (e.g., multiple choice exams, political surveys, any type of questionnaire). To simulate the interaction of synthetic players with the game, we use a cognitive graphical models (in particular, Bayesian networks) can introduce expert knowledge and external data into the simulation. Finally, we apply the proposed architecture and methods in the case of a serious game focused on Bayesian inference experiments using a hierarchical model to demonstrate the **

Index Terms- Synthetic data; Serious games; Cyberbullying; Item response theory; Bayesian network; Hierarchical Bayesian model; Computational social science

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