12-12-2022

AI meets Design Science - Towards Design Methods for AI Systems Development

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Towards Design Methods for AI Systems Development

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Artificial Intelligence (AI) is considered as one-fits-all-solution for often sparsely specified problems. But, practice shows that designing solution-oriented AI systems is still an open research topic (Ozkaya 2020). This is due to the ambiguous relation between AI systems and traditional software systems leading to uncertainties on how AI systems should be designed (Bosch et al. 2021). AI systems can be defined as software systems with symbolic and sub symbolic AI components (Bosch et al. 2021). Their deterministic as well as probabilistic nature leads to high error rates and therefore an inability to predict final outcomes of an AI system or to reproduce the same output (Ozkaya 2020). This aspect is reinforced by the central role of data in AI systems, being enabler on the one hand and constraint on the other. When asking for design methods handling these challenging aspects, contrary positions are given ranging from just applying established software engineering methods (Horneman et al. 2020) to missing guidelines in design of AI systems not comparable with conventional software systems (Ozkaya 2020). In contrast to the current AI hype, clear guidelines and design methods for AI systems development are missing both in practice and in research. Mostly, practitioners do not apply any design method for developing AI systems because available methods do not match with the specific characteristics of AI projects. In research, related work focuses on design methods for data analytics projects, i.e., developing pure sub symbolic AI systems (Baijens et al. 2020). Objective of the research presented in this talk is the investigation of appropriate design methods for AI systems development. We assume that there is no 1:1 mapping from design method to AI project type; therefore we present an approach that uses characteristics of design methods as a mediator between types of AI projects and potential design methods. AI projects in practice were analyzed with respect to applied design methods in a case study. In this talk, we present first results in form of correlation patterns between AI projects showing specific characteristics and potential design methods to be applied in these types of projects.

References

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