AAAI-MAKE 2021: Combining Machine Learning and Knowledge Engineering

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Symposium Proceedings Preface

The AAAI 2021 Spring Symposium on Combining Machine Learning and Knowledge Engineering (AAAI-MAKE 2021) brought together researchers and practitioners from the machine learning and knowledge engineering fields to reflect two years later the progress on the combination of machine learning and knowledge engineering after it has been raised in the 2019 AAAI spring symposium series for the first time.

With great success, many current AI solutions rely on machine/deep learning approaches, which help to solve complex tasks based on real-world data. It is most suitable for building AI systems when knowledge is not known or is tacit. While machine learning is now able to master data-intensive learning tasks, there are still some challenges. Many tasks require large amounts of training data, especially tasks where events to be predicted are rare. Often, machine output serves merely as a basis for decisions, which humans finally make.

Knowledge engineering and knowledge-based systems, which make expert knowledge explicit and accessible, are often based on logic and explain their conclusions. These systems typically require a higher initial effort during development than systems that use machine learning approaches. However, symbolic machine learning and ontology learning approaches are promising for reducing the effort of knowledge engineering.

Because of machine learning and knowledge engineering's complementary strengths and weaknesses, there is a demand in business to integrate and combine both AI methods for complex business scenarios. Focusing on only one aspect will not exploit the full potential of AI.

Two years after the first AAAI-MAKE symposium held in 2019 at Stanford University, the 2021 edition was held as a virtual event. The remarkable number of submissions showed a tremendous demand for combined/hybrid AI approaches. These proceedings are a collection of presented papers contributing to the symposium's aim of combining machine learning and knowledge engineering as well as other hybrid AI and neuro-symbolic approaches/methods.