

# Combining Machine Learning and Knowledge Engineering (AAAI-MAKE 2021)

Andreas Martin<sup>a</sup>, Knut Hinkelmann<sup>a</sup>

<sup>a</sup>FHNW University of Applied Sciences and Arts Northwestern Switzerland, School of Business, Riggbachstrasse 16, 4600, Olten, Switzerland

## Abstract

AAAI-MAKE 2021 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.

On the other hand, 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 an ongoing 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.

Three years after the first AAAI-MAKE symposium in 2019 held at the Stanford University, this 2021 edition as a virtual/international AI event has seen the most exceptional response, including a remarkable number of submissions ever, showing the tremendous demand for combined/hybrid AI approaches impressively. This extraordinary proceedings collection of presented papers contributing to the symposium's aim of combining machine learning and knowledge engineering extended it with other hybrid AI and neuro-symbolic approaches/methods.

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✉ andreas.martin@fhnw.ch (A. Martin); knut.hinkelmann@fhnw.ch (K. Hinkelmann)

🌐 <https://andreasmartin.ch> (A. Martin); <http://knut.hinkelmann.ch> (K. Hinkelmann)

🆔 0000-0002-7909-7663 (A. Martin); 0000-0002-1746-6945 (K. Hinkelmann)

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