Combining Machine Learning and Semantic Web:
A Systematic Mapping Study

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In line with the general trend in AI research to create intelligent systems that combine learning and symbolic components, a new sub-area has emerged that focuses on combining machine learning (ML) components with techniques developed by the Semantic Web (SW) community – Semantic Web Machine Learning (SWeML). Due to its rapid growth and impact on several communities in the last two decades, there is a need to better understand the space of these SWeML Systems, their characteristics, and trends. Yet, surveys that adopt principled and unbiased approaches are missing. To fill this gap, *in our recently published paper [1]*, we performed a systematic study and analyzed nearly 500 papers published in the last decade in this area, where we focused on evaluating architectural, and application-specific features. Our analysis identified a rapidly growing interest in SWeML Systems, with a high impact on several application domains and tasks. Catalysts to this growth are the deep learning and knowledge graph technologies. By leveraging the in-depth understanding of the area, we publish the classification SWeML Systems as an ontology. We bring a complementary view to the NeSy community by showing how the SW community is deploying neuro-symbolic systems.

References

[1] A. Breit, L. Waltersdorfer, J. F. Ekaputra, M. Sabou, A. Ekelhart, A. Iana, H. Paulheim, J. Portisch, A. Revenko, A. Ten Teije, F. van Harmelen, Combining Machine Learning and Semantic Web -A Systematic Mapping Study, ACM Computing Surveys (2023). URL: https://doi.org/10.1145/3586163.