

Preface of the First Workshop “Models in AI”

Ulrich Reimer,¹ Dominik Bork,² Peter Fettke,³ Marina Tropmann-Frick⁴

Preface

With the increasing availability of large amounts of data in practically all application areas, the field of artificial intelligence (AI) has been attracting increasing attention for some time now. Earlier approaches to AI were primarily associated with the *knowledge-based paradigm* where systems include domain-specific knowledge bases that provide the required (background) knowledge. The construction and maintenance of such domain models has to be done largely manually and therefore requires a great deal of time and money, which is why these approaches scale up poorly.

The new paradigm of *data-driven AI*, i.e. learning domain models and keeping them up-to-date by using data mining techniques, can help overcome these disadvantages. The models learned may be either symbolic (e.g. rules, decision trees) or sub-symbolic (neural networks). Classical data mining, however, also implies considerable manual effort, in particular for feature engineering. The rise of *deep learning* approaches, which embed the identification of relevant features into the learning processes themselves, may well contribute further to automating the creation of AI systems. In these cases, the generated models are of a sub-symbolic nature.

Data-driven AI is based on *models derived from data*, which usually cannot be inspected and understood by a human being: Models of a symbolic nature tend to be too complex, whereas sub-symbolic models do not contain structural elements that can be understood by humans. In many application scenarios, however, it is important that recommendations or diagnoses suggested by an AI system can be understood and assessed by humans. The ability of an AI system to explain concrete decisions, but also the possibility to inspect and thus comprehend the underlying models are therefore of central importance for the future use of such systems.

The workshop “Models in AI” focuses on the above mentioned topics, the papers highlighting various aspects of the role of models in data-driven AI systems. The workshop is set up to

¹ Fachhochschule St. Gallen, ulrich.reimer@fhsg.ch

² Universität Wien, Fakultät für Informatik, Währinger Strasse 29, 1090 Wien dominik.bork@univie.ac.at

³ German Research Center for Artificial Intelligence (DFKI) and Saarland University peter.fettke@dfki.de

⁴ Hochschule für Angewandte Wissenschaften Hamburg, Berliner Tor 7, 20099 Hamburg, Germany Marina.Tropmann-Frick@haw-hamburg.de

allow for ample time for discussion in order to consider a range of approaches and identify the current gaps as well as needs for further research. The outcomes of the workshop should therefore lay the foundation for future workshops on this topic.

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